BROAD BEACH GEOLOGIC HAZARD ABATEMENT DISTRICT

REGULAR MEETING AGENDA

Sunday, February 10, 2013 at 9:00 a.m.

Private Residence-
31330 Broad Beach Road, Malibu, CA 90265

Remote Participation Location via audio-only teleconference:
1805 Melhill Way
Los Angeles, CA 90049

Closed Sessions Matters

Under this item, the GHAD Board shall meet in a closed session to discuss matters pursuant to Government Code Sections 54956.8 and 54956.9 (a).

None.

Regular Session Matters

1) **Call to Order**

2) **Roll Call**

3) **Adoption of Agenda**

4) **Approve Summary of Actions from January 13, 2013 Meeting**

   Recommendation: Chair to conduct vote on approving Summary of Actions from January 13, 2013 Meeting. If passed, Chair to sign Summary of Actions.

5) **Ceremonial/Presentations**

   None.

6) **Consent Calendar**

   None.

7) **Public Hearings**

   None.

8) **Old Business**

a. Permitting and Regulatory Process. (GHAD Project Counsel and Engineer). Report to include project regulatory status summary, including:
(i) CCC Status- Matters to consider include CDP Status
(ii) SLC & APTR status
(iii) RWQCB and USACE update
(iv) Sand Source update (GHAD Engineer/Hummel): Alternative sources

b. Proposed GHAD Contracting Policy. Discussion of potential adoption of contracting rules. (GHAD Project Counsel)

Recommendation: Monitor development of GHAD contracting rules and/or procedures.

9) **New Business**

a. Proposed Moffatt & Nichol Contract Amendment. GHAD Engineer proposes to remove all markup for work commencing after November 1, 2012 and including Tasks 2 (Field Investigations) through Task 5 (Final Engineering). Commencing with pre-construction, Engineer seeks to reinstate a 5% markup, subject to further negotiation.

Recommendation: Agree with GHAD Engineer proposal, but ensure that proposed reinstatement of 5% markup can be further discussed/negotiated at pre-construction.

10) **GHAD Boardmember Reports**

11) **GHAD Officer Reports**

a. Treasurer's Report. (GHAD Treasurer).

b. GHAD Manager Report (GHAD Manager)

12) **Public Comment - Non-Agenda Items**

Communications from the public concerning matters which are not on the agenda but for which the GHAD Board has subject matter jurisdiction. The GHAD Board may not act on non-agendized matters except to refer the matters to staff or schedule the matters for a future agenda.

a. Public Comment on Non-Agendized Items

13) **Future Meeting**

Next Meeting: March 10, 2013; 9:00 a.m. Location: TBD, Malibu, CA

14) **Adjournment**

AGENDA ITEM 4

SUMMARY OF ACTIONS
BROAD BEACH GEOLOGICAL HAZARD ABATEMENT DISTRICT
REGULAR MEETING
JANUARY 13, 2013
31330 BROAD BEACH ROAD

1. CALL TO ORDER

Chair Karno called the meeting to order at 9:05 a.m.

2. ROLL CALL

PRESENT: Chair Karno, Vice Chair Grossman, Board Member Lotman, and Board Member Marquis.

ABSENT: Board Member Levitan and Advisor Goss.

GHAD STAFF ALSO PRESENT (not Board Members and not subject to Roll Call): GHAD Clerk and Treasurer Barbara Hamm, GHAD Engineer Chris Webb, and GHAD Project Counsel Ken Ehrlich.

3. ADOPTION OF AGENDA

The GHAD Clerk reported that the meeting Agenda was posted at 8:15 a.m. on Thursday January 10, 2013 within the boundaries of the GHAD. Board Member Marquis moved, and Vice Chair Grossman seconded, the approval of the Agenda. The motion approving the agenda passed 4-0.

The Chair announced that, since Board Member Lotman has indicated that he must leave the meeting at approximately 10:30 a.m., Agenda Item 4 (Approval of the Summary of Actions from the December 2, 2012 meeting) will be addressed later in the meeting so that the maximum number of Board Members can participate in the discussion of Agenda Item 8.

5. CEREMONIAL PRESENTATIONS

None.

6. CONSENT CALENDAR

None.

7. PUBLIC HEARINGS

None.

8. OLD BUSINESS

The Chair recognized the Vice Chair, who questioned a portion of the BBGHAD-Moffatt & Nichol contract regarding the markup of subconsultants fees and costs. The Vice

Chair stated that, review of Moffatt & Nichol's recent bills shows that the GHAD Engineer is marking up subcontractor and subconsultant costs at the rate of 5%. The Vice Chair. The Vice Chair requested that there be no markup on subcontractors and subconsultants fees and costs, and requested GHAD Engineer Moffatt & Nichol to report back to the GHAD Board on the GHAD Engineer's position.

a. Permitting and Regulatory Process

The Chair recognized the GHAD Engineer and asked for an update on the costs and projected longevity of potential sand sources, as reported at the December 2012 BBGHAD Board meeting. The GHAD Engineer stated that the cost estimates for sand source longevity estimates presented at the December 2012 BBGHAD Board meeting reflect the GHAD Engineer's best estimates of same based on state-of the-art analytical techniques and real world experience. But are not definite and precise numbers or amounts. Many natural factors, such as ocean forces, could effect the cost and longevity of potential sand sources, including tides and weather.

(i) Sand Sources

Ventura Harbor/Channel Islands

The Chair stated that, based on his review of the GHAD Engineer's December 2012 presentation, sand from the Ventura Harbor sand source on a per year cost would approximate two times the cost of sand from the Dockweiler sand source. The Chair also asserted that the Ventura Harbor sand source does not appear viable under project parameters of the need to nourish every 10 years since this material is not anticipated to last 10 years on the beach. Therefore, the Chair questioned the feasibility of using or even considering Ventura Harbor as a sand source.

The Chair recognized the Vice Chair, who commented that the GHAD Engineer's cost estimate for Ventura Harbor sand does not include BEACON's proposed mitigation fee and such fee would further increase the costs. Therefore, the Vice Chair asked if it would be possible for Ventura Harbor or other interested public entity(ies) to share in the costs associated with using Ventura Harbor sand. The Chair recognized Board Member Marquis, who stated that federal funding is likely for at least some portion of Ventura Harbor dredging in the foreseeable future. Therefore, Board Member Marquis cautioned that Ventura Harbor officials do not want to set a precedent of cost sharing because the agency has always relied in the past, and intends to rely in the future, upon 100% federal (or other third-party) funding of the harbor dredging costs.

The Chair recognized the Vice Chair, who stated that the GHAD should consider a less comprehensive, smaller scale project potentially resulting in a smaller dry sand beach so as to make Ventura Harbor sand work with the GHAD's assessment limit. Board Member Marquis stated that, as part of the sand source selection process, the BBGHAD seeks to place as much sand as possible on the beach. The real question is whether the permitting agencies will allow a reduced project to occur, including the possibility of an exposed revetment at certain times between nourishments. The Chair stated that, even if another public entity with an interest in dredging Ventura Harbor contributes funds toward the restoration project, the BBGHAD would still face the longevity problem associated with Ventura Harbor sand. Therefore, it would make sense for the BBGHAD to explore the possibility of the United States Army Corps of Engineers subsidizing dredging of the entire Ventura Harbor sand trap together with the GHAD-- or focus on another source.

The Chair recognized Board Member Marquis, who stated that the history of the dredging of Ventura Harbor does not bode well for a cost-sharing request. Board Member Marquis reiterated that federal funds have always been used for the full dredging of Ventura-area harbors, resulting in the removal of navigation impediments at both Ventura and Channel Islands Harbors. Board Member Marquis expressed concerns that the Ventura Harbor Commission or other stakeholders may feel as if the GHAD is changing the dynamic of regularized full federal funding of dredging activities. The GHAD Engineer added that the cost of dredging the Ventura Harbor entrance and pumping the dredged sand to a down coast beach typically is approximately $2.5 million. The GHAD could possibly mobilize the necessary dredge equipment, take the necessary sand from Ventura Harbor, place some of the dredged sand on Ventura-area beaches, and use the remainder for the Broad Beach project. Such a scenario could reduce the cost of the Ventura Harbor sand for the GHAD. The Chair also suggested the GHAD may seek permitting to use 200,000-300,000 cubic yards of Ventura Harbor/Channel Islands sand every second or third year to fall within the existing Ventura Harbor/Army Corps planning and scheduling. Board Member Marquis interjected that this scenario could be a problem as Ventura Harbor has specifically asked the GHAD to consider using Ventura Harbor sand for only the initial nourishment -- and not seek sand from these sources for future nourishments.

Dockweiler

Project Counsel reported that numerous meetings and discussions have occurred in the past month with City of Los Angeles and LA county officials, and indications are that the County Supervisors responsible for the Dockweiler sand source and the Broad Beach area want to facilitate the use of Dockweiler sand. County Supervisor staff indicates that they will assume responsibility for coordinating a meeting among the necessary public-entity stakeholders and report on the findings of such meeting to the GHAD. County Supervisors staff has indicated that they will attempt to conduct the necessary meetings by the end of January 2013. The Vice Chair urged that, if possible, Broad Beach homeowners attend any future meetings with Dockweiler sand stakeholders.

Inland Sources

Project Counsel reported that the GHAD Engineer is investigating additional, potential inland sources of sand, including various quarries around the Fillmore-Moorpark area. The GHAD Engineer is assembling cost estimates, including truck transport from the quarries to Broad Beach. Project Counsel recommended that the GHAD remain open to all potential, viable sand sources.

(ii) CCC Status

Project Counsel reported that the BBGHAD's response to the Coastal Commission's September 2012 "incomplete letter" crossed in the mail with the CCC's APTR comment letter. The GHAD believes that, with its response to the September 2012 CCC "incomplete letter", the GHAD has provided substantially all the documentation and analysis necessary to complete its CDP application. The CCC's comment letter asserts, among other points, issues with the GHAD's proposed dune access, revetment placement, nourishment duration, backpassing, and drainage issues. The Chair recognized the Vice Chair, who stated that the CCC's position is problematic as the entire restoration project is essentially a "revetment project" with everything else constituting mitigation. For example, the Vice Chair stated that the CCC's position on proposed homeowner access limitations is unreasonable in a non-starter for the BBGHAD.

The Chair asserted that almost all of the comment letters are uniformly opposed to the existence of the revetment or, at least, the potential exposure of portions of the revetment between nourishments-- and an assortment of other lesser issues. [Board Member Lotman left the meeting at this time, approximately 10:30 a.m.].

(iii) SLC Status

The Chair recognized Project Council, who identified the primary issues raised by the multitude of public comments received on the APTR: rocky habitat at west end, revetment placement, existence of septic systems and desire to move to a treatment plant, incomplete alternatives analysis, opposition to the 20-year proposed project duration and desire for indefinite nourishment commitment, opposition to use of sand from offshore Trancas Beach, opposition to the use of Manhattan Beach sand, and comments regarding the need to preserve Trancas Lagoon. The Chair recognized Board Member Marquis, who stressed the need to meet with senior CCC and SLC staff to, once again, attempt to reach consensus on the substantive issues and attain staff support for the project. The Chair stressed that the project needs to be politically, economically and environmentally acceptable for it to be permitted.

b. Proposed GHAD Contracting Policy

No report.

4. APPROVED SUMMARY OF ACTIONS FROM DECEMBER 2, 2012 MEETING

Board Member Marquis moved, and Vice Chair Grossman seconded, the approval of the Summary of Actions from the December 2, 2012. The motion passed 3-0.

9. NEW BUSINESS

None.

10. GHAD BOARD MEMBER REPORTS

Chair: reported that City National Bank seeks additional information regarding the BBGHAD's need for permanent project financing, and has been informed of the permitting status.

No other Board Members presented reports.

11. GHAD OFFICER REPORTS

a. Treasurer Report

The GHAD Treasurer reported that the BBGHAD has received $1,293,916.77 from LA County (indirectly through the City of Malibu) as the first disbursement of property tax assessment payments by BBGHAD property owners. The GHAD Treasurer stated that these funds were immediately used to re-pay all advances made to date on the BBGHAD's line of credit. As of January 11. 2013, the BBGHAD had cash on hand of approximately $25,000. The GHAD Treasurer reported that she does not yet have budget projections for 2013. The Chair and Board Member Marquis stated the need to develop alternative budget projections, a projection assuming construction of the project and a projection without construction. The Chair also directed Project Counsel to work with the GHAD Manager to ensure direct payments from the County to the BBGHAD in the future.

The Chair recognized the Vice Chair, who reiterated that he would like the GHAD Engineer to be paid outstanding invoices, but that such invoices should be reviewed to determine if the BBGHAD was charged any markup of subcontractor/subconsultant fees and costs. The Chair directed the GHAD Engineer and Project Counsel to confer and present the Board with a recommendation at the February 2013 Board meeting regarding subcontractor/subconsultant markup.

b. GHAD Manager Report

None.

12. PUBLIC COMMENTS: NON-AGENDA ITEMS

None.

13. FUTURE MEETING

The next GHAD Board Meeting will be on February 10, 2013 at 9:00 a.m. at a private residence located at 31330 Broad Beach Road. The Chair also mentioned that the following GHAD Board Meeting will likely be on March 10, 2013 at 9:00 a.m. at the same private residence.

14. ADJOURNMENT

The Chair recognized the Board Member Marquis, who moved to adjourn. The Chair seconded the motion. The motion passed 3-0. The meeting adjourned at 11:15 a.m.

Approved and adopted by the Broad Beach GHAD Board on February ____, 2013.

____
NORTON KARNO, Chair

ATTEST:

____
BARBARA HAMM, GHAD Clerk

AGENDA ITEM 8a.

BBGHAD Sand Source Matrix
7-Feb-13

CONFIDENTIAL DRAFT

Privileged & Confidential - Attorney Work Product

Project Scope:		600,000	cy	
	Conversion	1.4		
		840000	tons	
	weekly	50,000	cy	25,000
		70,000	tons	35,000
	weeks	12		24
	days	60		120

Source	Location	Contact	Transportation Mode	F.O.B Plant Price/ton (no tax)	Delivery Cost/ton*	Delivered Price /ton	Delivered Price /cubic yard	Commitment (total cy)**	Qty	day	week	month	Comments
Cemex	9035 Roseland Ave, Moorpark 93021 40 miles/57 minutes	Bryan Forgey: 909.210.2340 Bryan.Forgey@cemex.com	truck, dry screened	5.50	10.42	15.92	22.29	428,571	3,571	X			1) subject to diesel and bunker fuel surcharges if prices escalate 2) truck deliveries in bottom dumps: 6:00 a.m-6:00 p.m. 3) ship unloads to ocean floor at 3000t/hr or barge liter at 1500t/hr 4) Demurrage at $1600/hr after 48 hrs. 5) Polaris landed price subject to final review of permits and no port taxes 6) Materials price escalator at $.50/ton on 1/1/14 and 8/1/14 7) note to DRH: conversion may be 1.25 for dry screened (vs. 1.4) If so, delivered price = 19.90/cy Moorpark source 8) up to 7000t/day (vs. 5000 quoted) based on trucking availability, needs further analysis
	100 Lapis Road, Marina 93933 291 miles/303 minutes	Adam Lind: 916.467.6912 Adam.Lind@cemex.com	flatbed: 2.0 ton, 1.5 or 2.0 supersacks	8.00	42.00	50.00	70.00	71,429	595	X			
	Polaris Materials (Orca) Port McNeill, B.C.	Bryan Forgey: 909.210.2340 Bryan.Forgey@cemex.com	Panamax Ship: 76000t			23.25	32.55	214,286	108,571			X	
	Granite Pit, Littlerock 85 miles/95 minutes	Bryan Forgey: 909.210.2340 Bryan.Forgey@cemex.com	truck	4.50	14.92	19.42	27.19	214,286	2,143	X			
Lehigh Hanson	Sechelt Island, B.C.	Rick Beatty: 805.520.8707 Rick.beatty@hanson.biz http://www.facebook.com/pages/Lehigh-Materials-BC-Aggregates/139273961843162	Panamax ship: 76000t			0.00	0.00	pending					Company working with Carrier (CSL) to explore offloading and pumping methods pricing by 2/14/13
	11550 Live Oak Ave, Irwindale 91706 57 miles/73 minutes	Brian Serra: 714.797.5957 bserra@lehighcement.com	truck washcon nilsand	9.50 6.50	11.31 11.31	20.81 17.41	29.13 24.93	107,143	17,857			X	Moffatt & Nichol to review samples sent. $.50/t price increase 01/14 subject to fuel surcharge if diesel price escalates
Vulcan Materials	16001 Foothill Blvd, Irwindale 91706 64 miles/76 minutes	Nick Sarris: 323.226.8905 sarrisn@vmcmail.com	truck	15.00	11.31	26.31	36.83						subject to fuel surcharges if diesel price escalates
	13000 E. Los Angeles St, Irwindale 91706 55 miles/71 minutes		truck	15.00	11.01	26.01	36.42						
	2330 W. Highland Ave, San Bernardino 92407 100 miles/113 minutes		truck	15.00	15.59	30.59	42.82						
	6451 E. Avenue Y, Littlerock 87 miles/100 minutes	washcon sand	truck bottom dump end dump	11.00 11.00	14.06 14.58	25.06 25.58	35.08 35.81	214,286	35,714			X	
Holliday Rock	3193 W. Foothill Blvd, Upland 62 miles/83 minutes	John Holliday: 909.982.1553 jlhhrc@hollidayrock.com	truck	No Quote	11.12								
	7749 Avenue T, Littlerock 93543 84 miles/94 minutes		truck	5.00	11.50	16.50	23.10	300,000	2,500	X			Moffatt Nichol to review samples sent. Max 4000/t/day vs 3500 assumption Material used on Seal Beach restoration subject to fuel surcharge if diesel price escalates
P.W. Gillibrand	5810 Bennet Rd. Simi Valley 93062 28 miles/33 minutes	Jim Dean: 805.813.1509 Tim McGuire: 805.857.3347 jdean@pwgcoinc.com	truck 115 coarse WO90 Dune	23.00 13.00	10.50 10.50	33.50 23.50	46.90 32.90	107,143 for both	3,571	X			subject to fuel surcharge if diesel price escalates
Western Mtls (Grimes Rock)	3500 Grimes Canyon, Fillmore 93015 43 miles/52 minutes	Rusty Cochoran: 805.207.5553 rustycochran@gmail.com	truck dry screened	4.50	10.65	15.15	21.21	535,714	4,464	X			Commitment pending CUP hearing to increase truck trips to 500/day, 250/day commitment needs study Likely outcome in August-September If 1.25 yield (vs. 1.4), then 18.94/cy
Robertsons	301 W. Rosecrans, Los Angeles 90061 43 miles/58 minutes	Vince Barnanalto: 760.954.0855 vinceb@rmcs.com	truck	No Quote	9.49								Moffatt Nichol to review samples sent "pipe sand" 70,000 ton stockpile and 250t/hr production dry screened sand at 1.25 yield vs 1.4 If so, delivered price = 17.00/cy subject to fuel surcharge if diesel price escalates
	37790 7th St East, Palmdale, CA 93552 87 miles/99 minutes		truck	6.50	15.10	21.60	30.24	300,000	2,500	X			
Best Rock	2500 Grimes Canyon, Fillmore 44 miles/62 minutes	John Mooiezeri: 805.660.4110 johnmnow@gmail.com	truck	5.00	13.50	18.50	25.90	28,571	3,429	X			Moffatt Nichol to review samples sent, SE @ 55 low, #200 @ 11% subject to fuel surcharge if diesel price escalates
Petros del Pacifico S.A. de C.V.	Ensenada, Baja Norte, Mexico	Roberta Cariel: 619.778.1160 01152.164-4.1886140 m 01152.664.6844604 w Rcariel@amayoumel.com	barge: 10,000t	13.00	4.50	17.50	24.50	214,286	35,714			X	subject to Customs clearance offshore Broad Beach *note to DRH: conversion may be 1.25 for dry screened (vs.1.4) If so, delivered price = 21.88/cy
Decker Island Aggregate Materials	Decker Island near Rio Vista (Sacramento River Delta)	Tom Farrell: 832.276.7000 tfarrell@diaggregate.com	barge: 5000-14000t	7.00	58.00	65.00	91.00	171,429	28,571			X	
Wayne J Donati Materials	8455 Buena Vista St., Moorpark 93021	Brett Jones: 805.529.1323		10.00	10.23	20.23	28.33	42,857	357	X			generally nonresponsive subject to fuel surcharge if diesel price escalates
Other Sources Calleguas Creek	Las Posas at PCH 18 miles/25 minutes		truck	1.43	6.62	8.05	11.26	150,000	1,250	X			included $.75/ton for loadout, F.O.B $1.00 cy per Chris Webb daily delivery based on 6 month schedule can increase if required *note to DRH: conversion may be 1.25 for dry screened (vs.1.4) If so, delivered price = 10.07/cy subject to fuel surcharge if diesel price escalates Moffatt & Nichol research diesel and
Channel Island/PH Harbor Studies	Ventura County		barge			N.A.	N.A.						
Port San Luis	SLO County	Loch Dreizler: 805.595.5431 lochd@portsanluis.com	barge	0.00	8.00	8.00	11.20						March 1 dredge at Sport Launch, 25,000cy max, 150 nautical miles est Renewing permit (exp. 2013) for 250K cy total/annum. Source for future maintenance? Tug and barge cost is best estimate only
Offshore Dockweiler Beach borrow	L.A. City		barge			N.A.	N.A.						JM&M negotiations with City of L.A.
Thompson Pier	San Diego	Vern Santos: 916.939.4107 v17santos@gmail.com				N.A.	N.A.						wants to source from San Diego through Thompson Pier. Doubtful that Navy will allow, given past personal experience w/ imports. Sand source also questionable and unreliable.
Gordon Sand	Guadalupe 135 miles/155 minutes	George Gordon: 310.676.7500 Georgelll@GordonSand.com	truck No Quote	8.00	19.73	27.73	38.83						80,000ton/year CUP limits resource, F.O.B price is best estimate

* Unless directly quoted, assumes minutes ("Location" column) plus 20 minute loadout X $60/hr X 2 (round trip)
** Assumes 6 month construction schedule

Budget Analyses
2/7/2013
(excludes sales tax)

	Quantity	Yield @ 1.4t/cy		Extension	Yield @ 1.25t/cy		Extension
Option One: All sourced by truck							
Cemex Moorpark *	450000	22.29	$	10,029,600	19.90	$	8,955,000
Callegua Creek	150000	11.26	$	1,689,000	10.27	$	1,540,500
Total	600000	19.53	$	11,718,600	17.49	$	10,495,500
Option Two: truck and barge							
Cemex Moorpark *	250000	22.29	$	5,572,000	19.90	$	4,975,000
Petreos del Pacifico	200000	24.50	$	4,900,000	21.88	$	4,376,000
Callegua Creek	150000	11.26	$	1,689,000	10.27	$	1,540,500
Total	600000	20.27	$	12,161,000	18.15	$	10,891,500
Note: 50K tons/month may not be efficient for suction dredge							
Option Three: truck, barge and ship							
Cemex Moorpark *	150000	22.29	$	3,343,200	19.90	$	2,985,000
Petreos del Pacifico	150000	24.50	$	3,675,000	21.88	$	3,282,000
B.C. Panamar	150000	32.55	$	4,882,500	32.55	$	4,882,500
Callegua Creek	150000	11.26	$	1,689,000	10.27	$	1,540,500
Total	600000	22.65	$	13,589,700	21.15	$	12,690,000
Note: Orca and Sechelt are 1.4 yield only							
Option Four: truck, with barge and ship **							
Cemex Moorpark *	154000	22.29	$	3,432,352	19.90	$	3,064,600
Petreos del Pacifico	80000	24.50	$	1,960,000	21.88	$	1,750,400
B.C. Panamar	216000	32.55	$	7,030,800	32.55	$	7,030,800
Callegua Creek	150000	11.26	$	1,689,000	10.27	$	1,540,500
Total	600000	23.52	$	14,112,152	22.31	$	13,386,300

**: assumes compressed two month barge/ship delivery

*: Used Cemex Moorpark over Grimes Rock, because Grimes does not have trucking entitlement in hand

AGENDA ITEM 8a(ii)

JMBM | Jeffer Mangels Butler & Mitchell LLP

Kenneth A. Ehrlich
Direct: (310) 785-5395
KEhrlich@jmbm.com

1900 Avenue of the Stars, 7th Floor
Los Angeles, California 90067-4308
(310) 203-8080 (310) 203-0567 Fax
www.jmbm.com

Ref: 72321-0002

January 30, 2013

VIA E-MAIL

Jason Ramos
Environmental Scientist
California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825-8202

Re: Broad Beach Restoration Project (the "Project')
Analysis of Impacts to Public Trust Resources and Values ("APTR")
Responses to Comments from the County of Los Angeles,
Department of Beaches and Harbors ("DBH")

Dear Mr. Ramos:

Our office represents the Broad Beach Geological Hazard Abatement District (the "GHAD"), the applicant for the above-referenced Project. This letter responds to the DBH's APTR comment letter dated December 19, 2012. As the comments in the DBH letter primarily summarize those provided in an attachment to the letter (a cursory memorandum prepared by Noble Consultants), we address each of the numbered comments provided in the attachment, as well as two additional "concerns" noted by DBH.

As a preliminary matter, we are compelled to note a serious and significant number of misconceptions and errors regarding the Project, the Project applicant, and the requirements of review under the California Environmental Quality Act ("CEQA"). Many of these misconceptions and errors may originate from DBH's cursory review of the APTR. Far from the "most comprehensive review" of the APTR claimed in the letter, the Noble Consultants memorandum that formed the basis of the letter appears only to have reviewed one section (3.1, Coastal Processes), while either ignoring or simply missing other analyses (such as section 3.6, Geological Hazards and Mineral Resources, and Chapter 4, Alternatives) that directly address DBH's purported concerns. The significant errors that suffuse the letter and memorandum include: (1) the erroneous assumption that the Trancas Property Owners Association ("TPOA"), rather than the GHAD, is the Project applicant; (2) the erroneous implication that Broad Beach is or will be a private beach, the restoration of which would provide little or no public access or other benefit; and (3) the underestimation of available sediments by a factor ranging from about 60 to about 100.

As discussed in detail below, these errors and misconceptions, combined with the lack of evidence presented by DBH or Noble Consultants to support their assertions, produce comments that are addressed either by the APTR itself or by other information within the administrative record for the Project. Consequently, DBH fails to raise any substantial new environmental issue regarding the Project or the APTR.

Review Comment 1

Review Comment 1 states that the APTR analysis—and in particular, Figure 3.1-7—implies that erosion at Broad Beach will continue, and that "conclusive[] and confident[]" prediction of the same cannot occur. This conclusion ignores the analysis provided in the APTR (including, in fact, aspects of the very figure cited), wrongly implies that any action requires absolute certainty of knowledge regarding existing and predicted conditions and effects, and wrongly implies that the Project and the APTR somehow fail to acknowledge sand loss as a significant issue, when short- and long-term sand loss is what the Project was *specifically proposed to address*.

As described in detail on pages 3.1-19 to 3.1-22 and illustrated in Figure 3.1-7 of the APTR, a linear regression analysis of shoreline retreat by Moffatt & Nichol (2012) illustrates clear periodic and linear average rates of beach loss at and around Broad Beach from 1970 to 2010. As stated on page 3.1-21, the moving average appears to indicate some acceleration in the 2000s. However, "the linear regression . . . indicates that the beach has lost width at an average rate of about 2 feet per year since 1970." Consequently, although the rate of erosion could theoretically exhibit different patterns than those observed to date, a clear trend exists for Project planning and impact analysis purposes.

Further, contrary to the implication of the comment, any uncertainty regarding long-term beach behavior or conditions does not simply render the APTR analysis flawed. As stated on page 3.1-9 of the APTR, the analysis was based upon substantial quantities of data, from a variety of sources, regarding conditions at Broad Beach and the Zuma Littoral Cell since 1946, a period of over 60 years. As discussed below, the quantity and quality of available data provide more than substantial support for the conclusions of the APTR. The comment provides no evidence at all—let alone substantial evidence—to support any particular alternative data source or any particular alternative beach erosion rate for planning purposes, nor does the comment suggest any specific impact associated with the same. Rather, the comment merely suggests generalized "concerns" about "long-term consequences" for Zuma Beach, without providing any detail regarding specific concerns or challenging any specific determination in the APTR.

Notwithstanding the above, and as described on pages 3.1-10 to -12 and illustrated in Figures 3.1-2 and 3.1-3 of the APTR, available data demonstrate that beach retreat currently occurs at Zuma Beach, despite the transport of sediment from Broad Beach. Moreover, as described on pages 3.1-10, 3.1-32, and 3.1-35 to 3.1-36 of the APTR, significant sand transport occurs eastward from Broad Beach, and nourishment of Broad Beach would provide additional sand that wave-induced longshore currents would partially distribute to these eastward beaches, including Zuma. These conclusions are further supported by the attached recent report, *Sediment Transport Along the Malibu Coast*.[1] Based on the stabilizing effects of nourishment and backpassing on Broad Beach, as well as the secondary accretive effects on Zuma, Westward, and Point Dume State Beaches, the impacts of the Project on public trust resources—specifically including Zuma Beach—are, as stated for Impacts CP-1 and CP-3 on pages 3.1-33 and 3.1-36 of the APTR, "substantial and beneficial" and "positive," respectively. Although the APTR acknowledges that benefits regarding shoreline erosion would occur primarily in the short- and mid-term horizons (p. 3.1-31), increased sediment transport would continue to occur long after the Project horizon described in the APTR.

As noted in the comment, the Project horizon is 20 years, which the APTR characterizes as short- to mid-term. Nonetheless, the long-term nature of beach erosion is clear and is clearly disclosed in the APTR. Importantly, the 20-year Project horizon does not represent a limitation inherent to the types of activities that comprise the Project or to the GHAD. Rather, 20 years represents the maximum lease term permitted in this case by the State Lands Commission and the maximum permit term contemplated in this case by the Coastal Commission. Irrespective of this time horizon, assessments on property owners within the GHAD will continue indefinitely and ensure, subject to permitting and the will of the GHAD, the long-term availability of funds for additional backpassing, nourishment, and maintenance of restored coastal dune habitat at Broad Beach. Assuming the continuation of leases and renewal of permits by the appropriate agencies, the GHAD intends to continue the activities that the Project would permit well into the future. No credible evidence, whether provided in the comment or otherwise, suggests that maintenance of the work completed under Project would simply cease after two nourishment events.

Review Comment 2

This comment incorrectly states that the TPOA serves as the Project applicant. The TPOA, a voluntary, unincorporated private association, is not the applicant for the Project. Rather, the applicant is the GHAD, a statutorily authorized local government agency. As described above in the response to Review Comment 1, the time horizon of the Project is a product of agency permitting procedures, and not of any lack of ability or willingness to fund further nourishment and associated activities at Broad Beach. A fee assessment on property owners within the GHAD will continue indefinitely, and assuming the grant or renewal of necessary permits to do so, it is assumed that the GHAD would continue to fund nourishment and associated activities at Broad Beach.

The comment correctly notes that the APTR does not ascertain the longevity of each nourishment "with absolute confidence." However, "absolute confidence" is neither present or attainable in any beach nourishment undertaking, and does not represent a legal or practical requirement for the purposes of the APTR. Moreover, the comment grossly mischaracterizes the

[1] Craig Everts, December 17, 2012 (the "Everts Sediment Report").

discussion of longevity in the APTR and wrongly implies that a seven-year range is the best estimate provided for a single nourishment event. In fact, page 3.1-31 of the APTR states that three to four years represents the most conservative analysis for the west end of Broad Beach, with seven or eight years representing the most conservative estimate for the east end of Broad Beach, based solely on the standard mathematical shoreline evolution model ("GENESIS"), which contains key predictive limitations that hinder an accurate assessment of conditions at Broad Beach. As described on the same page and on pages 3.1-32 to 3.1-33, the model does not account for documented climate-related cyclic wave changes and contradicts historical sand loss trends. In light of these factors, the APTR determined with a high degree of confidence that an eight- to ten-year lifespan for each nourishment event is both reasonable and well-supported by available data. Thus, as properly concluded in the APTR, 16 to 20 years or more would elapse "before erosion *begins* to impact the dune system" (emphasis added), even under the unwarranted assumption that no further beach or dune maintenance of any kind would occur.

Review Comment 3

As stated above in the response to Review Comments 1 and 2, the time horizon for the Project is 20 years as a result of the leasing and permitting policies of the State Lands Commission and the Coastal Commission, respectively. The limited permit life of the Project distinguishes it from other projects that involve the construction of habitable structures or bridges and other works. Contrary to the comment, the GHAD is not "reluctant" to commit to further shoreline management activities, and the mechanism for funding those activities will continue indefinitely.

However, despite the approximately 20-year Project horizon, section 3.6 (Geological Hazards and Mineral Resources) of the APTR already considers the long-term effects of the loss of all Project-related sand and exposure of the revetment, as summarized below. Because the comments did not appear to have considered sections of the APTR other than section 3.1 (Coastal Processes), they do not appear to have been informed by this analysis and therefore raise no legitimate objection to the APTR.

Impact GEO-1, on pages 3.6-12 to 3.6-13 of the APTR, analyzes the stability of the revetment itself within the context of the projected *100-year* economic life of the landward residential structures along Broad Beach Road. As described in the analysis, assuming the loss of all sand associated with the beach and dune restoration—whether through a series of severe storms or after the projected life of the Project—several processes could reduce the integrity of the revetment. Surf action, including a tsunami, could detach and scatter smaller rocks or boulders from the revetment, reducing the integrity of the structure. Subsurface water could infiltrate and remove sediment underlying the revetment, increasing the potential for lateral spreading that would exist in the absence of a restored beach and dune system. Seismically induced liquefaction, settlement, and lateral spreading also could reduce the structural integrity of the revetment. Eventually, if the revetment remains exposed and unrepaired, winter surf alone, as well as tsunamis and seismic events, could either penetrate or overtop the revetment, damaging septic systems and leach fields (and possibly the residences themselves). This damage could adversely affect water quality and the ability of the public to safely use Broad Beach, and could increase calls for emergency services to Broad Beach. The analysis also concludes that the long-term effects of sea-level rise could exacerbate these effects. Overall, the APTR considers these impacts potentially significant, and describes a mitigation measure (TBIO-8a, which requires beach and dune nourishment, backpassing, and dune maintenance) and design measures included in four project alternatives (Alternatives 4.2.1, 4.2.2, 4.2.3, and 4.2.6) that would reduce or avoid the impacts described above to a less-than-significant level.

Also, contrary to the comment, the APTR does not describe the entire revetment as structurally deficient. Rather, as described on page 3.6-13, the central and eastern portions could experience five percent damage under certain "critical conditions." However, as described above, the APTR concludes that mitigation measure TBIO-8a, or the alternative design features, would reduce any impact associated with the structural integrity of the revetment to a less-than-significant level.

Review Comment 4

The comment correctly notes that the Project depends upon suitable sand resources. However, the comment fails to describe how that dependency differentiates the Project from any other beach restoration or nourishment effort, nor could it do so with any credibility. The comment also vastly misstates the volume of suitable sand available within the Santa Monica Bay, understating the correct volume by about two orders of magnitude. Lastly, the comment appears not to recognize that, although the Project is privately funded, it comprises restoration of a *public beach*, as well as the enhancement of *public access* to the same, in response to erosionary processes. Thus, the recommendation in the comment regarding the reservation of sand for "public beaches" (impliedly not including Broad Beach) is misapplied and the suggestion for the different treatment of Broad Beach on this basis is both unwarranted and contrary to the very policy the comment purports to champion.

As illustrated in the attached diagram summarizing the results of investigations by Osborne *et. al* (1983) regarding sand sources in the Santa Monica Bay, over 500 million cubic yards of potentially suitable sand is available outside the littoral zone and within the Santa Monica Bay. If sand only with a grain size greater than 0.3mm is considered, about 198 million cubic yards of sand remain available for beach nourishment. Even the smaller volume is *over 60 times greater than the three million cubic yards claimed in the comment.*

As described throughout the APTR, and particularly in Sections 2.2.3, 2.2.4, and 2.2.9, the initial restoration and subsequent renourishment are anticipated to require 1.1 million cubic yards of suitable material. The most suitable material is 0.3mm or more in grain size to maximize the efficacy of the restoration, as smaller grain sizes will transport more easily from the beach, requiring a substantially greater frequency of nourishment. Thus, the total demand associated with the Project represents *about one half of one percent* of suitable material 0.3mm or greater, *or about one fifth of one percent* of all potentially suitable material, not the approximately 33 percent claimed by the comment. These numbers also demonstrate that, contrary to the comment, multiple additional nourishment cycles at Broad Beach would not—indeed could not—exhaust suitable sand resources within the Santa Monica Bay. Moreover, as additional nourishment cycles at Broad Beach would occur to reverse the effects of erosion and sea level rise at a public beach (just as with the Project), the use of the sand would remain perfectly consistent with and would further the policies of the draft Coastal Regional Sediment Management Plan.

Review Comment 5

The comment claims, but completely fails to substantiate, that the Point Dume Submarine Canyon (the "Canyon") would intercept up to 90 percent of all sediments deposited in the Zuma Littoral Cell as part of the Project. Page 3.1-8 of the APTR suggests, on the basis of a single 1999 study, that the Canyon could intercept up to 70 percent of migrating sediments. However, contrary to the APTR and the unsubstantiated claim in the comment, the attached Everts Sediment Report reached a far different result. As described in detail in that report, a review of all but one of the major studies prepared regarding the Canyon; direct, systematic observation of the underwater features of Point Dume and its surroundings; and detailed calculations of the sediment budgets north and south of Point Dume; demonstrate that the Canyon does not capture a significant portion of sand. Among the particular features noted by Everts were:

- The volume of sediment received at Point Dume from sources west, combined with sediment added between Point Dume and Sunset Point, matched the amount of sediment deposited at Santa Monica and Venice, indicating that most, if not all, of the sediment that reached Point Dume passed between Point Dume and the Canyon between 1946 and 2007;
- A large separation distance (over 1,800 feet as of 1976) between Point Dume and the Canyon, and the position of the Canyon outside the littoral zone, rendering unlikely the capture of substantial quantities of sediment from the littoral zone;
- The mild slope face and lack of slumping observed for the Canyon, in comparison to the steep slope faces and slumping observed at other canyons known to trap substantial quantities of sediment, indicating that little if any sediment trapping occurs on a regular basis;
- Vegetation coverage at the head of the Canyon, indicating that low sediment deposition had occurred;
- A sand-covered sediment transport surface, indicating unchecked movement of sand;
- The persistence of sandy beaches in Dume Cove (i.e., east of Point Dume) during all seasons, which likely would not occur in the absence of a sand source west of Point Dume; and
- The small offset between Westward Beach and Point Dume, indicating that low volumes of sediment are deflected seaward from the point toward or into the Canyon.

The Everts Sediment Report also identified at least two key errors within the 1999 report cited by the APTR, namely: (1) the assumption that sand transport occurs evenly throughout the zone in which transport occurs (rather, it declines as one moves seaward), and (2) the mis-identification of the source of sand as the Zuma Littoral Cell (rather, the sediment originates from the continental shelf, outside the littoral zone). These errors lead to a massive exaggeration of the volume of sand entering the Canyon from the beaches, and form the genesis of the erroneous estimate in the 1999 report cited by the APTR that only 30 percent of transported sediment passes the Canyon.

Collectively, the observations above compel the conclusion that, contrary to the comment, the Canyon does not serve as a significant sediment trap. In fact, substantial, regular sediment transport occurs from north of Point Mugu to Santa Monica and Venice Beaches. Therefore, nourishment of Broad Beach with sediments from the Santa Monica Bay would result in the gradual and eventual re-deposition of those sediments within the Santa Monica Bay, as indicated by Figure 1-2 of the APTR.

Review Comment 6

The precise design of the dunes is estimated at about 60 percent completion, and the GHAD has provided the current designs to the State Lands Commission and the Coastal Commission for review and comment before design work further progresses. However, nothing precludes the APTR from evaluating a conceptual design and mitigating potential impacts on that basis, and mitigation measures within the APTR include performance standards that the dune restoration ultimately must meet. Regarding access, the provision of defined accessways would remain consistent with historic use patterns at Broad Beach, but would, by ensuring that beach access occurs only via certain limited means, *reduce* the potential for damage to ecological resources, rather than increase it.

Review Comment 7

As discussed in the response to Review Comment 1, contrary to the comment, the APTR devotes considerable attention to coastal processes in the Zuma Littoral Cell. As described at length in the APTR, longshore wave activity distributes sediments generally eastward from Broad Beach to Zuma Beach. Thus, a direct relationship exists between the two sites.

As stated above in the response to Review Comments 1 and 2, the time horizon for the Project is 20 years as a result of the leasing and permitting policies of the State Lands Commission and the Coastal Commission, respectively. Contrary to the comment and as discussed above, the GHAD is committed to further shoreline management activities, assuming the extension of permits for the same, and the existing mechanism for funding such activities would exist indefinitely. However, despite the approximately 20-year Project horizon, section 3.6 (Geological Hazards and Mineral Resources) of the APTR already considers the long-term effects of the loss of all Project-related sand and exposure of the revetment, as summarized in the response to Review Comment 3.

Review Comment 8

The presence of privately maintained improvements, including domestic sewage leach fields, and the Coastal Commission's prior grant of permits for the same and for shoreline protection devices, are existing conditions that provide the baseline against which the APTR evaluates the potential environmental impacts of the Project. Consequently, the APTR is not required to—and should not—evaluate the wisdom or rationale of such improvements or their approval as part of its review of the Project. *See, e.g., Fat v. County of Sacramento*, 97 Cal. App. 4th 1270 (2002) (holding that even prior unpermitted activities properly constituted the baseline for the purposes of analysis under CEQA). Nonetheless, the GHAD provided to the State Lands Commission and the Coastal Commission a separate report showing the location of each private waste system for each residence on Broad Beach, as well as the physical possibility and feasibility of moving each system landward of its respective residence. Many parcels lack sufficient landward clearance from public rights-of-way for such a relocation, and in other cases, such a relocation is cost-prohibitive, as is a complete extension of the public sewage system and expansion of the treatment plant. Additionally, Chapter 4 (Alternatives) of the APTR—which also was apparently not evaluated by DBH—evaluated seven alternatives to the Project, two of which included partial or full removal of the revetment as part of the beach and dune restoration effort. Therefore, contrary to the comment, "more beach restoration plans" absent the revetment were directly considered in the APTR.

Additional Concerns Expressed by DBH

Ventura Harbor

The GHAD has continued to pursue the use of sediments from Ventura Harbor for the Project. We have conducted significant due diligence and outreach to key stakeholders, including Ventura Harbor officials, Ventura city and county elected officials, BEACON representatives, and others. However, two potential problems threaten the feasibility of using this sand source for the Project. First, use of the sand requires a three-step process of collection, distribution into a barge, and transport and deposit, which could as much as double the cost of the material in the first instance. Second, we understand that BEACON seeks additional mitigation for the use of the sand (in addition to the significant cost of retrieving and transporting the sand to Broad Beach) , the potential cost of which would further increase the total Project cost beyond the GHAD's current assessment authority.

Venice and Dockweiler Beaches

The comment incorrectly asserts that the City of Los Angeles holds mineral rights to both Dockweiler and Venice Beach sediments. In fact, the City of *Santa Monica* holds the mineral rights to Venice Beach sediments and has communicated to the GHAD that it simply would not consider the GHAD's use of those sediments. In contrast, discussions with the City of Los Angeles regarding Dockweiler Beach sediments remain ongoing. Therefore, the APTR properly considers Dockweiler Beach as a potential source of material for the Project.

Conclusion

As described in detail in the responses above, the comments provided by DBH are undermined by a range of serious misconceptions and errors regarding the Project, the Project applicant, CEQA, and available sediment resources, as well as an apparently narrow review of the APTR. Moreover, where the comments express disagreement with the premises or conclusions of the analysis, they provide no evidence—let alone substantial evidence—to support their assertions. As each of the nominally substantive comments above are addressed either by the APTR itself or by other information within the administrative record for the Project, the DBH fails to raise any substantial new environmental issue regarding the Project or the APTR.

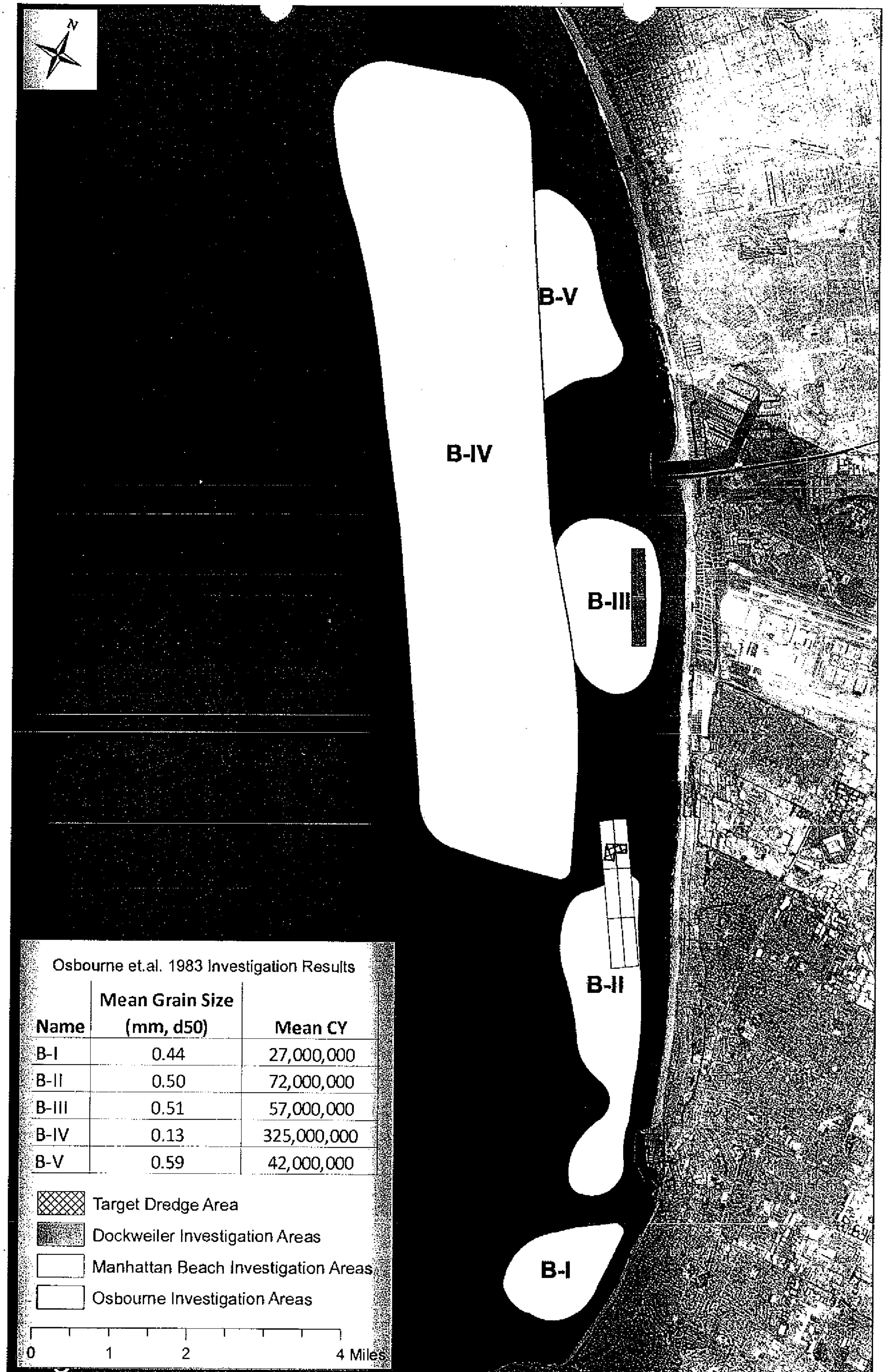
We look forward to working with the State Lands Commission to complete the APTR process and facilitate consideration of the Project. Please contact our office with any questions or concerns.

Very truly yours,

KENNETH A. EHRLICH,
a Professional Corporation of
Jeffer Mangels Butler & Mitchell LLP

KAE:neb

cc: Jack Ainsworth, California Coastal Commission
Daniel P. Swenson, D.Env., U.S. Army Corps of Engineers
David M. Attaway, City of Los Angeles Department of Recreation and Parks
Steve Napolitano, Chief of Staff, Los Angeles County Supervisor Don Knabe
Maria Chong-Castillo, Deputy, Los Angeles County Supervisor Zev Yaroslavsky
Michael Shull, City Los Angeles Department of Recreation and Parks
Clare Bronowski, Chair, County of Los Angeles Beach Commission
Virginia Kruger, 3rd Dist. Appointee, County of Los Angeles Beach Commission
Neill E. Brower, Esq.



Name	Mean Grain Size (mm, d50)	Mean CY
B-I	0.44	27,000,000
B-II	0.50	72,000,000
B-III	0.51	57,000,000
B-IV	0.13	325,000,000
B-V	0.59	42,000,000

SEDIMENT TRANSPORT ALONG THE MALIBU COAST

Report prepared by Craig Everts, Everts Coastal

Report prepared for Moffatt Nichol

17 December 2012

Abstract

Since at least the last two-thirds of the 20th century, about 250,000 cubic yards of sand were annually transported in a west-to-east direction to Point Dume. Less than 1000 cubic yards per year (cyy) were deflected into Dume Submarine Canyon. Added to the large amount that moved around the headland was sand discharged from the Santa Monica Mountains and sand freed as sea cliffs eroded. In total about 300,000 cyy reached Santa Monica and Venice. New beach was first created after 1934 in the lee of and to the west of the Santa Monica Breakwater. This structure is the most effective beach retention device in southern California. After 1959 the north jetty at Marina del Rey began functioning to retain sand at Venice. Almost five acres of additional beach was, and continues to be, created each year between the foot of Sunset Boulevard and Marina del Rey.

A balanced sediment budget provides the most direct and convincing proof of this continuum of sand movement. A compelling line of evidence that Dume Submarine Canyon is not a significant sink for littoral sand is based on the large separation distance between the canyon and Point Dume, the water depth at the canyon rim, the characteristics of the infill deposit in the head of the canyon, the usually smooth sediment transport surface between the canyon rim and Point Dume, and the small offset between Westward Beach and Point Dume. Relationships between these factors and sand capture in other southern California submarine canyons when applied to Dume Canyon indicate it is not a significant sink for littoral sand.

Sand, with the appropriate size distribution (and, of course, taken from outside any littoral zone) will if artificially placed at Broad Beach initially benefit Broad Beach. But over time it will move east thereby temporarily benefiting Zuma and Westward Beaches. But in due course almost all of it will pass Point Dume and most of it will pass Malibu. It will eventually end up at Santa Monica and Venice. Its behavior as it moves east will be the same as that of sand that entered the coastal stream in the past from as far away as Port Hueneme.

INTRODUCTION

This report summarizes and synthesizes existing data to provide what I believe is the best available estimate of the amount of sediment that has been recently transported east to Point Dume, the amount that has been deflected seaward into Dume Submarine Canyon, and the amount that passed Point Dume and was deposited at Santa Monica and Venice. With one omission of the references I am aware of, I have also evaluated approaches taken by other investigators who have estimated the amount of littoral sand lost Dume Submarine Canyon. The exception is Orme (1991), a report I was unable to access.

Sediment budget and submarine canyon analyses indicate almost all of the large quantity of sand that reaches Point Dume from the west passes Point Dume and is deposited along the Santa Monica and Venice coast. Justification for these findings is at the Conclusions section of the report. Conclusions are based on two lines of evidence treated separately; sediment budget analyses, and an evaluation of the sand capture potential of Dume Submarine Canyon based on its physical setting and other features in comparison with those factors in submarine canyons in southern California that have been more rigorously investigated. Figure 1 is a location map of the Modern Malibu Littoral Cell. The coastal reach between Point Mugu and Marina del Rey is the focus of my discussion.

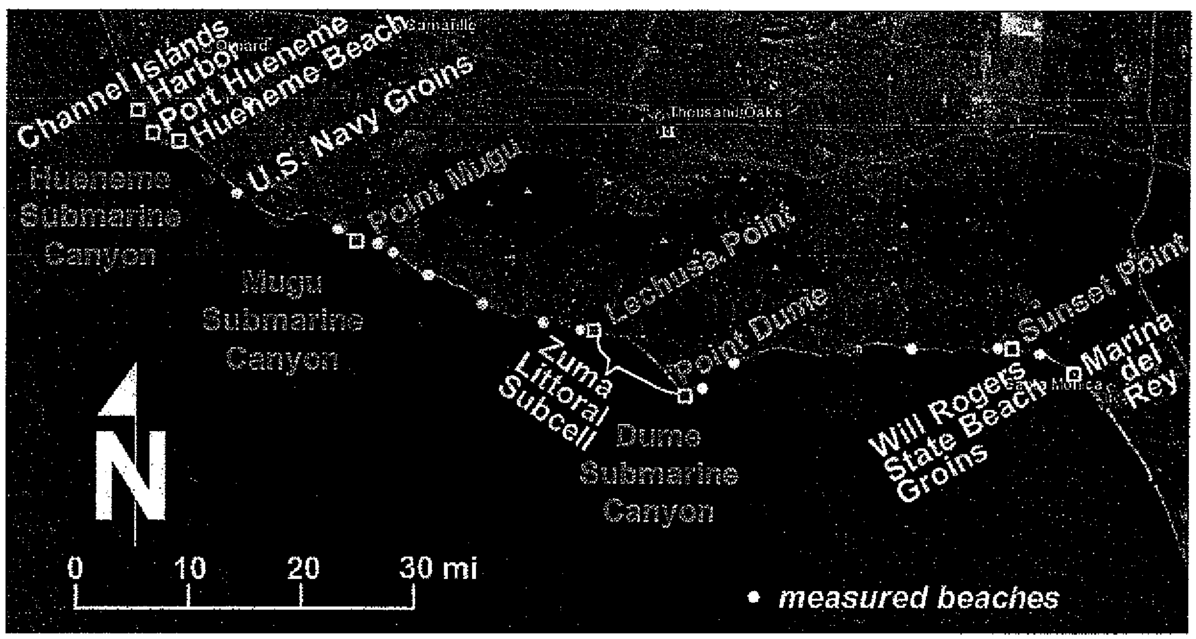


Figure 1. Location map; Sunset Point is the projection of the coast where Sunset Blvd intercepts PCH (from Everts Coastal, 2011).

ALONGSHORE SEDIMENT TRANSPORT PAST POINT DUME

A sediment budget for the coast between Point Mugu and Marina del Rey, when balanced, clearly shows most sand moves in a west-to-east direction past Point Dume rather than being diverted offshore into Dume Submarine Canyon. A sediment budget analysis involves balancing the amount of change in sediment volume in a specified segment of littoral zone against the sum of all quantities of sediment that reach that littoral segment minus the amount that leaves it over a specified time period. Sediment budgets rely on the principal of conservation of sediment volume. Sand volume changes in the littoral zone affect the size of the beach; changes in sand volume outside it do not. The seaward limit of the littoral zone is referred to as the pinch-out depth. This depth is 25 to 30 ft below mean sea level between Point Mugu and Marina del Rey. Pinch-out depth is an important boundary when sand is borrowed to replenish a beach. If borrow material is taken from the littoral zone it is a form of sand theft. When it is taken from a site beyond the pinch-out depth it does not affect the littoral sand budget (although it may affect incident waves to the detriment of the adjacent beach).

In the following discussion the dependent variable, or unknown, is the amount of sand that moves along the coast at Westward Beach, at Dume Cove, and east of the coastal projection where Sunset Blvd. intersects PCH. We refer to that projection as "Sunset Point" (Fig. 1).

Two budgets tell the story: one between Point Mugu and Point Dume and the other from Point Mugu to Marina del Rey. Sand sources are: (1) transport from west to east around Point Mugu, (2) stream discharge from watersheds in the Santa Monica Mountains, (3) sand release when unarmored sea cliffs are eroded, and (4) beach erosion - if it occured. We assume sand does not move landward from the Continental Shelf to the littoral zone or seaward from the littoral zone to the Shelf. While this component of a budget may be important in some places it is difficult to quantify and most investigators assume it to be negligible.

We begin with the rate at which sand accumulated between Sunset Point and Marina del Rey. That rate, based on surveys and shoreline positions on aerial photographs, has been measured and agreement on its magnitude exists, within bounds, in all published references. Deposition was concentrated in two places depending on time interval. Sand transport from west to east around Sunset Point between 1934, when the Santa Monica Breakwater was built, and the mid-1950s is equal to the amount that was deposited in the creation of the sandy protrusion in the lee of the breakwater (the salient) and the sandy fillet that formed west of the salient plus the amount that was artificially bypassed to the sand-starved beach at Venice (1.8 million cy according to Patch and Griggs, 2006, p 63). Between 1934 and the mid-1950s little or no sand passed the salient and the beach at Venice experienced severe erosion. Sand was later trapped in the Will Rogers groin field a short distance east of Sunset Point. The groins were constructed in the 1960s. Jetties were constructed at Marina del Rey in 1959 and once the salient, fillet and groin field beaches attained equilibrium size, probably before the mid-1970s, almost all the sand that passed Sunset Point was deposited at Venice. An exception was the small amount that made it through or around the north jetty. Using dredging records and bypass volumes for sand removed from the marina entrance and placed on Dockweiler Beach, Reppucci (2012) defines the latter amount as 30,000 cyy (1964-2012 average). Patch and Griggs (2006, p 65) estimate 3000 cyy was discharged in Ballona Creek, leaving 27,000 cyy of the dredged material having entered the region dredged area from Venice. Estimates of Santa Monica and Venice depositional quantities are listed in Table 1 with references to source. The approximate annual rate of 310,000 cyy of sand is based on the average of 285,000 cyy of all the estimates of sand deposition north of Marina del Rey plus the 27,000 cyy that passed through and around the jetty. Uncertainty in the 310,000 cyy is hard to establish, but it is probably less than plus or minus 30,000 cyy for the period 1933-2010.

Table 1. Sand deposition at Santa Monica and Venice.

measurement time interval	coastal reach	average deposition rate, cubic yards per year	reference
1933-late 1940s	Santa Monica Breakwater and upcoast	270,000	Handin, 1950
1933-late 1940s	Santa Monica Breakwater and upcoast	280,000	USACE, 1950
Pre-1984	Santa Monica and Venice	192,000	DMJM, 1984
1960-1988	Santa Monica and Venice	217,000	USACE, 1986
recent	Santa Monica and Venice	400,000	USACE, 1994
1946-1974	Santa Monica and Venice	280,000	Everts Coastal, 2011
1974-2007	Santa Monica and Venice	350,000	USACE data (2011)

The second step in the sediment budget effort is to estimate how much of the 310,000 cyy was supplied to the coast and lost or gained as beaches expanded or contracted between Point Dume and Santa Monica and Venice. The two sources of sand that reach this segment of coast are the Santa Monica Mountains and sea cliffs. There is agreement between investigators, within bounds, on the magnitudes of these sediment fluxes like there is for the depositional rate at Santa Monica and Venice.

Most recent estimates of upland contributions are those described in Patch and Griggs (2006) and Knur (2011). Less than 67,000 cyy and perhaps much less Santa Monica Mountain watershed sediment that is beach compatible sand was discharged to the coast west of Santa Monica according to Willis and Griggs (2003) as referenced in Patch and Griggs (2006, p 58). They note ... *"Santa Monica Mountain streams cumulatively discharge ~43,000 cyy of sand."* and "*Malibu Creek contributes ~24,000 cyy of sand.*" They go on to say "*this is an over-estimation of the volume of sand that will actually remain on the subaerial beaches*" because it represents sand "*... coarser than 4Ø (0.0625mm), or the sand/silt break on the commonly used Wentworth Scale. The littoral-cut-off-diameter, which is the smallest grain-size of sediment that will remain on the* *beaches, for this cell was determined to be 3Ø (0.125mm)."* The overall watershed that contributes sediment to the littoral zone is about 270 square miles with the Malibu Creek watershed contributing about 110 sq mi of the total. If the Patch and Griggs 43,000 cyy estimate is weighted by distance for the coast on either side of Point Dume, their estimated upland contributions would be 22,000 cyy west of Point Dume and 45,000 cyy east of it. In contrast to this relative small combined contribution, Knur and Kim (1999, p208) give a 160,000 cyy approximation of the sediment yield to the coast west of Santa Monica. These and earlier estimates of the discharge of sand-sized Santa Monica Mountain sediment to the littoral zone east and west of Point Dume are shown in Table 2. Values are of watershed contributions for the period closest to the date of the reference publication. The average Table 2 contribution between Point Mugu and Point Dume is 41,000 cyy. It is 72,000 cyy between Point Dume and Santa Monica.

Table 2. Estimates of the sediment yield from the Santa Monica Mountains to the littoral zone between Point Mugu and Santa Monica Canyon.

reference	Pt Mugu to Pt Dume	Pt Dume to Santa Monica Cyn	Total in cubic yards per year
Handin, 1950	60,000	94,000	154,000
USACE, 1950			75,000 (1926-1945)
Taylor, 1983 (natural conditions)			84,500
Moffatt and Nichol, 1992			121,000
USACE, 1994			160,000
Moffatt and Nichol, 1995	38,000	46,000	84,000
Knur and Kim, 1999	50,000	110,000	160,000
Patch and Griggs, 2006	<22,000*	<45,000*	<67,000
Knur, 2011 (recent yield)	35,000	65,000	110,000

*estimate made by splitting the Patch and Griggs total contribution weighted by distance between boundaries

Sea cliff erosion contributes substantially less sediment to both segments of the coast than that discharged from upland sources. Patch and Griggs (2006) estimate 13,000 cyy of sand are on average released between Point Mugu and Sunset Point with an average 8,000 cyy reaching the littoral zone between Points Mugu and Dume and about 5000 cyy east of Point Dume. Moffatt and Nichol (1995) estimated the contributions from sea cliffs between 1960-1988 at 7700 cyy from Point Mugu to Point Dume and 3700 cyy between Point Dume and Santa Monica. The average of the Patch and Griggs and Moffatt and Nichol estimates is a release of about 8000 cyy of sand west of Point Dume and 4000 cyy east of it.

When averaged for the period 1938 - 1988, the position of the shoreline between Point Mugu and Sunset Point has been remarkably (and not often recognized) stable as shown in Table 3. Although after 1974 it retreated a great deal at Broad Beach, Zuma and Westward Beaches advanced a slight distance before 1988 (Everts Coastal, 2011). Table 3 is based on Moffatt and

Nichol (1995) shoreline position measurements on aerial photographs for two periods: 1938-1960 and 1960-1988.

Table 3. Mean shoreline change rates on sandy segments of coast between Point Mugu and Sunset Point, feet per year (from Moffatt and Nichol, 1995 and Everts Coastal, 2011).

Location	Point Mugu to Lechusa Point	Lechusa Point to Point Dume	Point Dume to Topanga Canyon
1938-1960	+4.3	+2.7	+0.4
1960-1988	-3.2	+0.8	-0.1
1938-1988	+0.1	+1.6	+0.1

Table 4 combines watershed and sea cliff sand contributions and sand losses as the beach expanded slightly in the 50-yr period between 1938 and 1988 (last row Table 3). An average 1.4 cubic yards per foot of beach expansion per lineal foot of beach was assumed in relating shoreline position change to littoral volume change (volume change is height of berm = 12 ft, plus depth at pinch-out location = 26 ft, times shoreline change, times length of coastal segment). Just as Point Mugu and the north jetty at Marina del Rey are the west and east boundaries of our sediment budget, the pinch-out depth is the seaward boundary of the control volume used in our sediment budget analyses. The slight beach expansion (assuming a much smaller change in the back boundary of the beach) equates to a loss of sand moving downcoast (sand accumulates and is withdrawn from the longshore sand transport regime when a beach expands). Row 5 in Table 4 is the estimated net longshore sand transport rate at Sunset Point; Row 6 is the calculated amount that passed Point Mugu. An examination of Table 4 shows the calculated annual average amount of sand that reached Point Dume from the west in recent years was 247,000 cyy (253,000 cyy passed Point Mugu and 6000 cyy was taken up through beach expansion). It indicates 63,000 cyy was added between Point Dume and Sunset Point to equal the measured 310,000 cyy that was deposited at Santa Monica and Venice.

Table 4. Estimated watershed and sea cliff sand contributions and contributions or losses of sand as the beach contracted or expanded along the coast between Point Mugu and Sunset Point in cubic yards per year.

1	2	3	4	5	6
sediment flux from	**Point Mugu to Point Dume**	**Point Dume to Sunset Point**	**Point Mugu to Sunset Point (column 2 plus column 3)**	**deposition between Sunset Point to Marina del Rey**	**calculated mount that must have passed Point Mugu (column 5 minus column 4)**
watershed and sea cliffs (gain)	49,000	76,000	125,000		
beach expansion (loss)	-55,000	-13,000	-68,000		
Total (rows 3 and 4)	-6000	63,000	57,000	310,000	253,000

LITTORAL SAND LOSS TO DUME SUBMARINE CANYON

Sand moves east from Broad, Zuma and Westward Beaches. Upon reaching Point Dume it stays within the littoral zone and continues moving to the east along the Malibu coast, or it is deflected seaward into Dume Submarine Canyon, or the outcome is a combination of both fates. The position of Dume Canyon with respect to Point Dume, the separation distance between the canyon and point, the depth of the canyon rim, the characteristics of the sand deposit in the head of the canyon, the sediment transport surface seaward of the point and landward of the canyon, and the small offset between Westward Beach and the point, all suggest very little of the large quantity of sand that reaches Point Dume is deflected into Dume Submarine Canyon. Evidence based on past studies of littoral sand capture in submarine canyons in southern California is persuasive in this regard.

Eight submarine canyons south of Point Conception have been studied in more detail than canyons elsewhere and in more detail than Dume Canyon. Each of these canyons either capture littoral sediment or are close enough to the coast that they might be sand traps. Named mostly for nearby physical or jurisdictional features, they are from west (north) to east (south): (1) Hueneme, (2) Mugu, (3) Dume, (4) Redondo, (5) Newport, (6) Carlsbad, (7) Scripps, and (8) La Jolla. By far Mugu Submarine Canyon captures the most sand (Moffatt and Nichol (1995);

Carlsbad Canyon captures little if any (Everts and Dill, 1988, p 11 and 14). Relationships between physical canyon characteristics and sand capture in these canyons allow for a meaningful assessment of the effectiveness of Dume Canyon as a sand trap. Three factors especially affect the quantity of sand that has been captured: shore-parallel transport toward them from both directions, the distance between the adjacent shoreline and canyon rim (or rim depth) and the shore-parallel length of the rim, and the planform configuration (shape as viewed from above) of the shoreline landward of the canyon (Everts and Eldon, 2005).

Potential Sand Loss

The total quantity of littoral sand that can possibly be captured in a submarine canyon is the sum of the amounts that move parallel to the shoreline toward the canyon from either direction. Given the orientation of the shoreline in Dume Cove, essentially no sand returns to Point Dume from north to south once it passes the point. Accordingly, the maximum amount of sand that could be captured in Dume Submarine Canyon is the amount that moves from northwest to southeast along Westward Beach. This is the net longshore sand transport rate at Point Dume, which our sediment budget analyses pegged at about 250,000 cyy (Table 4).

Distance to Canyon Rim.

Littoral sand reaches a submarine canyon either through offshore-directed transport from shallow seabed locations thence over the canyon rim, or else it moves parallel to shore over the canyon sidewalls landward of the pinch-out depth. Most is lost through shore-normal transport during winter storms (Everts et al., 1987, Everts and Eldon, 2005). Some sediment also enters submarine canyons in deeper water from the Continental Shelf beyond the littoral zone, but that contribution does not affect the beach.

As long ago as 1966, Shepard and Dill noted the Dume canyon head did not penetrate inside the 50-ft isobath although they stated it comes within 1800-ft of the shoreline. Everts Coastal, (2011) considers the rim to be at about 60 ft (Fig. 2) or well outside the littoral zone which ends at the 27 ft pinch-out depth at Point Dume. For this reason we believe the Knur and Kim (1999) statement that *"Only 30% of littoral sediments bypass the Dume Submarine Canyon."* is incorrect. They base their conclusion on a calculation of the depth of initiation of sand motion with the assumption that transport occurs at an equal rate from shore going seaward to the limiting depth of sand motion (defined as the depth beyond which no significant seasonal transport or movement of littoral sand takes place) and claim …*"70 % of the littoral sediments enter the canyon where it is too deep for the littoral currents to carry it."* Even if there was no decline in alongshore sand transport going seaward, which is not a good assumption of the cross-shore gradient, the source of sand they describe as entering the canyon comes from the Continental Shelf, not the littoral zone. The loss they describe would not be connected with the beach system.

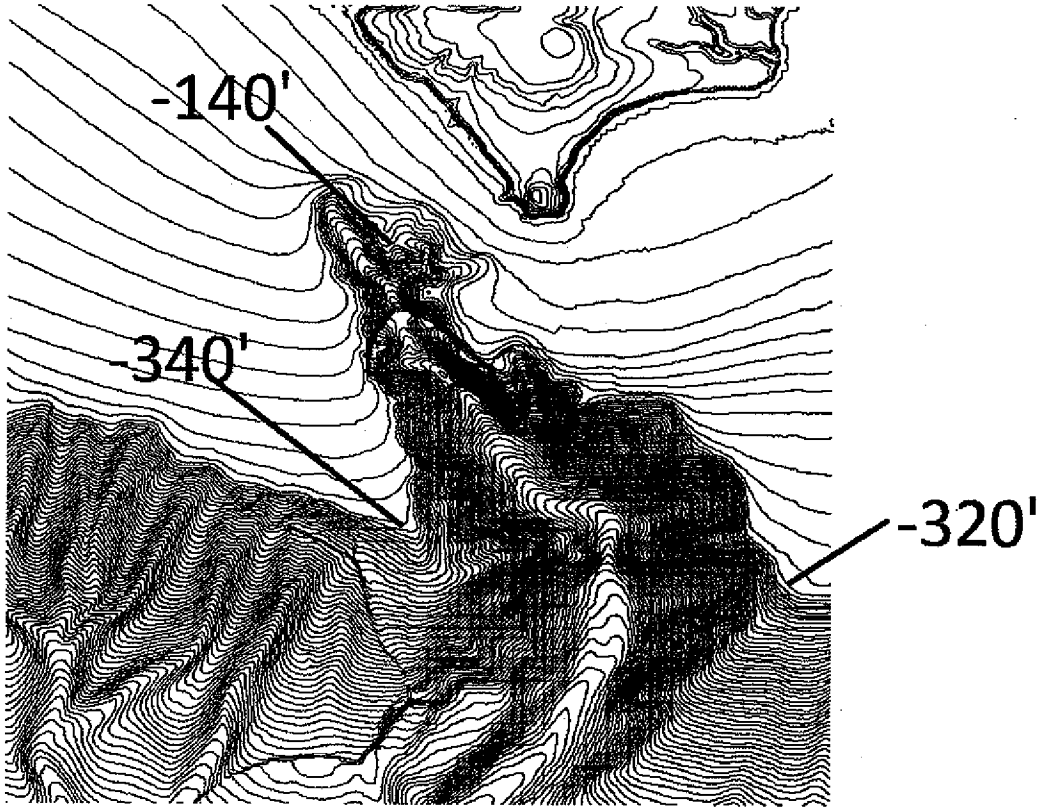


Figure 2. Bathymetry in the vicinity of Dume Submarine Canyon (from NOAA National Geophysical Data Center: *Digital Elevation Model of Santa Monica, California Integrating Bathymetric and Topographic Data Sets*).

Offshore-directed transport is inversely proportional to the distance from the shoreline and reversible sediment movement becomes nil at the pinch-out boundary (as previously noted, about -27 ft, msl datum). This cross-shore transport rate to depth (or distance) relationship is based on sound physical principals and is well accepted. With limitations, such as whether the shoreface is entrenched landward of the canyon head, it also applies to submarine canyon sand capture. Mugu Canyon, for example, since 1946 trapped about 75 percent of the sand that reached it with the amount captured between 650,000 and 850,000 cyy (Everts Coastal, 2012). The rim of Mugu Canyon is in a depth of about 3 ft (msl) and the width of the alongshore transport corridor landward of its rim is less than 100 ft in some places. In contrast, Carlsbad Canyon, which captures essentially no littoral sand, is about 4400 ft from shore and its rim is in a depth of 120 ft (Everts and Dill, 1988). The distance from Point Dume to the rim of Dume Submarine Canyon is about 800 ft and the width of the littoral zone transport corridor is about 450 ft (Everts Coastal, 2011) so alongshore sand transport is well landward of the canyon and cross-shore transport must be especially intense if it is to reach the canyon head during storms.

Headwall width is also a factor in the percentage of sand that moves alongshore and is lost to a submarine canyon. The headwalls of Mugu and La Jolla Submarine Canyons are thousands of feet wide and both capture a large portion of the sand that reaches them. La Jolla Canyon is at the end of its littoral cell and captures all of it. As previously noted, Mugu Canyon captures a large percentage. The alongshore width of the headwalls of other submarine canyons in southern California, including Dume Canyon, are significantly less and thus present a lesser target for the loss of alongshore-moving sand during an episode of seaward-directed cross-shore sand transport.

Point Dume as a Littoral Barrier.

The distance between the shoreline and head of a submarine canyon is not the only factor that influences the portion of alongshore-transported sand that is captured. Canyons with comparable distances offshore exhibit very different capture fractions. Over time, those at the ends of their littoral cells (Redondo and Scripps) capture all of the sediment that reaches the littoral zone near them (Everts and Eldon, 2005, Fig. 14). Canyons located away from complete barriers to longshore transport, like Dume Canyon, capture less. In a headland/canyon situation like that at Dume Canyon, the offset between the shoreline of the upcoast beach and the headland that retains it offers a clue to the strength of the current that is deflected offshore at the headland.

Point Dume is a sediment-blocking structure just like the groins at Will Rogers State Beach or the Chevron Groin at El Segundo. Effective groins and headlands like those retain a larger beach on their sides from which most sand approaches (the upcoast side) than would exist if they were absent. Sand must pass around their ends because they are high and impermeable. The extent to which it is deflected seaward is inversely proportional to the distance between the sandy upcoast shoreline and the tip of the structure. The relationship varies depending on many variables, but where the net longshore sand transport rate is high and predominantly in one direction, like it is at Point Dume, the distance the longshore current is deflected seaward before it is no longer contained by the structure is important. If that distance is short much of the longshore current passes seaward of the structure without being deflected. The Point Dume offset, as shown in Figure 3 is small (about 60-ft at the time the photo was taken), suggesting sand reaching the point is usually not deflected a great distance seaward.

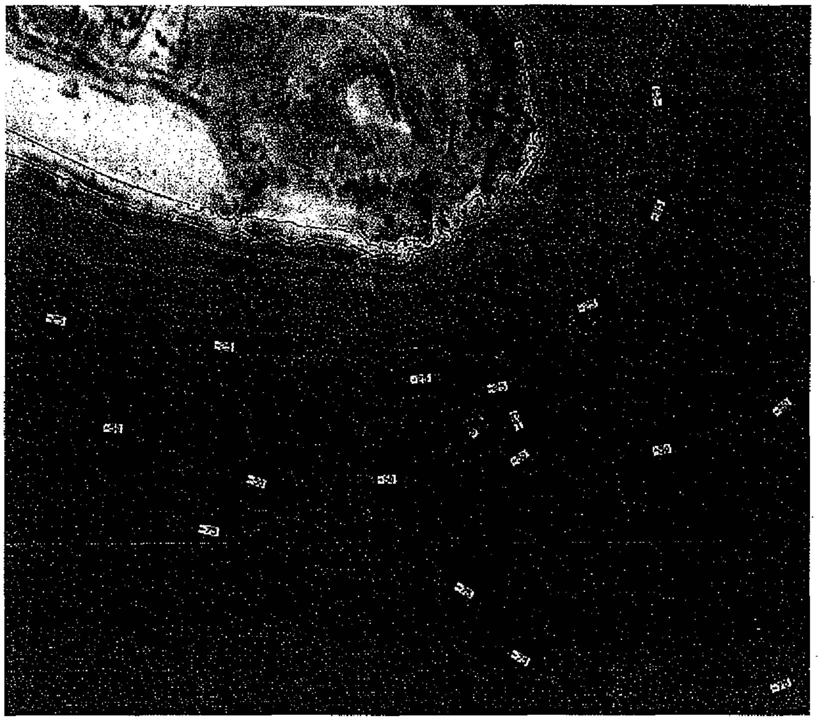


Figure 3. Bathymetry at Point Dume (from USACE Shoals NAVD 88, December 2009).

Shoreline Planform.

Everts and Eldon (2005) found submarine canyons located off seaward protrusions in the shoreline (Newport, Hueneme and Dume) tend to capture much less of the sand volume that is transported alongshore than canyons adjacent to shoreline embayments or indentations (Mugu and to a lesser extent Scripps). First, bathymetric contours are typically steeper and the littoral zone is correspondingly narrower off points, like Point Dume (Fig. 3) so alongshore transport occurs closer to shore. Second, while waves diverge over all canyons due to refraction, alongshore currents tend to be generated in the direction of the open angle between the shoreline and the crests of the dominant waves (Everts and Eldon, 2005). This angle increases in indents and declines at projections of the coast like Point Dume. Everts and Eldon also report the incidence of rip currents toward and in some cases into submarine canyons at shoreline indentations is more frequent than the frequency of rip currents on nearby beaches. In contrast, they are less frequent where the canyons are seaward of protruding shorelines. This relationship is a further indication Dume Canyon is not a substantial trap for littoral sand.

Canyon Environment.

Moffatt and Nichol (1995) report the results of three reconnaissance scuba dives made into the head of Dume Submarine Canyon in 1992. The goal was to estimate the role of the canyon as a sink for littoral sediment. They found the gently-rounded north rim at a depth of about 60 ft below mean sea level.

Sediment quantities trapped and transported down submarine canyons are roughly proportional to infill slip slopes. Everts and Dill (in Moffatt and Nichol, 1988, Moffatt and Nichol, 1995, and Everts and Eldon, 2005) conclude a steep slipface (up to 33 degrees, the angle of repose) is characteristic of deposits in canyon heads that consistently receive high influxes of littoral sand. The mild slope in Dume Canyon (measured at 14-19 degrees to depths of at least 75 ft) indicates there was a low infusion of sand in the months leading up to the reconnaissance visit. There was no evidence of slumps such as those found in canyon heads that trap substantial quantities of littoral sand (Moffatt and Nichol, 1988).

Vegetation coverage was another indication the head of Dume Canyon had not received sand in the recent past. Small marine plants covered about 50% of the canyon head and thick vegetation was observed on three 3-ft high pinnacles of hard igneous rock that outcropped at a depth of 85 ft. Just landward of the rim in water depths of 50-60 ft low (less than ½ ft) they report marine vegetation covered 40-70% of the seabed. In depths of less than 50 ft the bottom was sand- and ripple-covered without vegetation. Based on these observations and in comparison with other canyons Moffatt and Nichol (1995) concluded Dume Submarine Canyon was not a significant trap for littoral sand although ... *"some sand surely reaches the canyon during infrequent, severe storms, the quantities are likely small."*

Longshore Sand Transport Surface.

In-water observations, bathymetry (Fig. 3) and aerial photographs (Fig. 4) show the seabed offshore Point Dume provides a surface upon which sand moves around the point. In October 1992 when Moffatt and Nichol (1995) made their in-canyon reconnaissance, they also swam a long zig-zag dive seaward of Point Dume in water depths of 7 to 30 ft (msl). The purpose was to determine the character of the seabed. They found sand with scattered boulders and the rocks that pierce the water surface in a depth of about 25 ft as shown in Figures 3 and 4. They also found a ledge, in places covered with eel grass near the shore, which extended out toward the exposed rocks. The seabed was sandy on the west side of the ledge with sand in patches on its east side. In Figure 4 the ledge is sand-covered indicating unchecked sand movement around Point Dume when the photo was taken. That sandy transport surface is probably continuous during the winter when waves approach from the northwest or west and sand is transported to the east. Southern swell likely reduces the size of the sand fillet on the west side, sometimes exposing the ledge during summer and autumn times of longshore transport reversals. NOAA chart 18744 shows a tongue of sand that extends east from the position of the ledge which also indicates transport inshore of the pinch-out location off Point Dume. Further, beaches in Dume Cove are sandy and persistent in all seasons which would not be a likely if their source was not west of Point Dume.

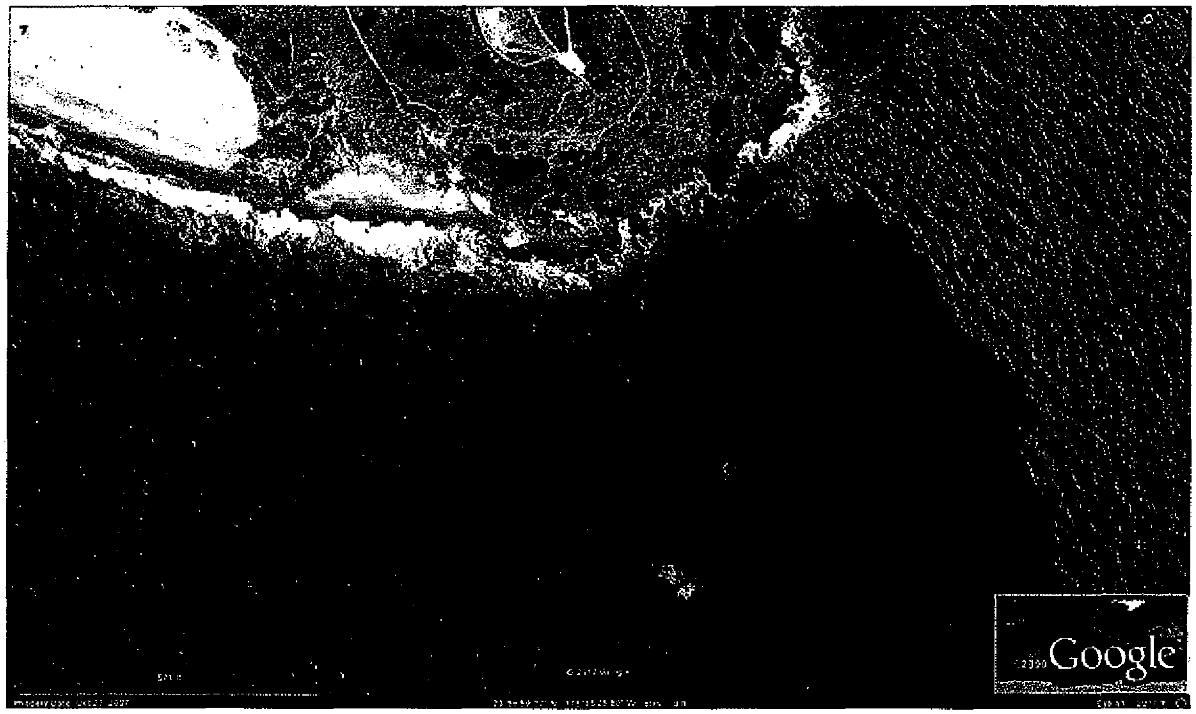


Figure 4. Aerial photograph showing the seabed south of Point Dume (Google Earth, 23 October 2007).

CONCLUSIONS

Project objectives were to estimate the amount of sediment that has recently: (1) been transported east to Westward Beach and Point Dume, (2) been deflected seaward into Dume Submarine Canyon, and (3) passed Point Dume and continued east along the Malibu coast to eventual deposition at Santa Monica and Venice. Sediment budget and submarine canyon analyses indicate almost all of a large quantity of sand reached Point Dume from the west, passed it and was later deposited along the Santa Monica and Venice coast. Dume Submarine Canyon captured a very small amount of sand that reached Point Dume.

Sand Transport to and Past Point Dume.

Based on sediment budget analyses, approximately 250,000 cyy of sand passed Point Dume in the latter two-thirds of the 20th century. That finding, however, does not tell us how much was lost in Dume Submarine Canyon. But when the 253,000 cyy attributed to Point Mugu bypassing (Table 4) is compared to 290,000 cyy that Everts Coastal (2011, p 23) estimates as the amount that passed Point Mugu between 1946-2007 it seems clear that most of the sand that got to Point Dume was not lost in the canyon. Furthermore, continuity of sand volume (sediment budget) calculations indicate almost all of it ended up at Santa Monica and Venice. The difference between the 253,000 cyy and 290,000 cyy estimates should not be construed as the amount that was captured in the canyon. Those values were obtained through different approaches. The latter also represents Point Mugu bypassing for different time periods. Everts Coastal (2011) calculated the average net transport around Point Mugu between 1946 and 1974 at 440,000 cyy and a much less 140,000 cyy for the interval 1974-2007. The 290,000 cyy estimate is the time-weighted average that includes these shorter intervals.

What is most important is both estimates show a large amount of sand reaches Point Dume. The rather small difference (37,000 cyy) in their magnitudes indicates much more sand reached Point Dume than the 8000 cyy estimate Patch and Griggs (2006, p 65, Fig. 6-10) made (of which they posit 5600 cyy was trapped in Dume Canyon and 2400 cyy passed Point Dume to beaches to the east). They also conclued (p 60, 61) Mugu Canyon is such an effective littoral trap that little to no sand is transported past Point Mugu. Conversely, Everts Coastal (2011) concluded about 75 percent of the sand that reached Mugu Submarine Canyon between 1946 and 2007 was lost therein and 25 percent passed it. Interestingly, in a figure depicting the movement of sand along this coast, Coastal Frontiers (1992, Fig. 2, p 12) shows sand transport parallel to shore entering Santa Monica Bay around Point Dume with the only submarine canyon sink being Redondo Beach.

Littoral Sand Capture in Dume Submarine Canyon.

Sediment budget evidence indicates most of the sand that reached Point Dume eventually ended up at Santa Monica and Venice and thus could not have been lost in Dume Submarine Canyon. Relationships based on past studies of littoral sand capture in submarine canyons in southern California are also persuasive in this regard.

Factors especially important are: the amount of sand that is transported parallel to shore landward of a canyon, the distance between the adjacent shoreline and canyon rim (or rim depth), the length of the rim parallel to the shoreline, and the planform configuration (shape as viewed from above) of the shoreline landward of the canyon. All else being equal canyons with long headwalls in shallow water close to shore and located off planform indentations in the shoreline (versus off points) capture the largest portion of the sand that moves toward them in the littoral system.

First, sand is only susceptible to capture once at Point Dume since it only reaches the point from the west. As a consequence, the canyon has only one shot at trapping it. In nearly all other places in Malibu it moves to the east most of the time, but some of the time it also moves to the west.

Second, since offshore-directed transport declines with distance from shore and given that the rim of Dume Canyon is almost twice as far from shore as the pinch-out location littoral sand only reaches Dume Canyon during severe episodes of offshore-directed transport during storms.

Third, the amount of littoral sand captured in a submarine canyon is partially determined by the time it takes to pass landward of the canyon head. That time interval declines proportional to the alongshore transport rate and it increases proportional to the alongshore length of the headwall. At Dume Canyon the headwall is not comparatively long compared to other canyons in southern California and the movement of sand along the coast is rapid.

Fourth, where canyons are located adjacent to headlands, the distance longshore currents are deflected seaward before they are no longer constrained by the headland is proportional to the offset between the shoreline of the upcoast beach and the tip of the headland. When the offset distance is small, much of the longshore current that carries sand passes downcoast he headland without being deflected. Offset distances for the groins at Will Rogers State Beach and all of the headlands between Point Mugu and Point Dume are on the order of 60-100 ft. None of these structures is believed to deflect sand out of the littoral zone (Everts and Eldon, 2010). The offset distance at Point Dume is also small, suggesting sand there is similarly not deflected seaward of littoral zone, at least in substantial quantities.

Fifth, canyons located off protuberances in the shoreline tend to naturally capture much less of the longshore sand transport volume than those adjacent to shoreline embayments. Bathymetric contours are typically steeper and the littoral zone is correspondingly narrower off points so transport occurs closer to shore. Further, because alongshore currents are generated in the direction of the open angle between the shoreline and the crests of the dominant waves and waves diverge over all canyons, the breaking wave angle tends to increase in shoreline indents and decline along projections. Dume Submarine Canyon is located seaward of a projection of the coast, suggesting it is less susceptible to infilling with littoral sand than if it were located seaward of a straight segment or off an embayment.

Sixth, the frequency and especially the quantity of sand carried into a submarine canyon is proportional to the slope of the infill deposit in the canyon's head. The mild slope in the infill deposit of Dume Canyon and the lack of slumps is indicative of a low infusion of sand.

Seventh, in-water observations, bathymetry and aerial photographs all indicate the seabed offshore Point Dume is at least sometimes sandy. Transport around it is not affected by protruding rocky impediments landward of the pinch-out location where most alongshore sand transport occurs during the winter. Waves almost continuously approach from the northwest or west and most sand is transported to the east during that season.

Moffatt and Nichol (1995) estimated about 1000 cyy was recently lost in Dume Canyon. Everts and Eldon (2005) reckoned the canyon captured between 500 cyy and 1000 cyy in the 20th century. From field inspection, Inman (in Jaykim Engineers, 1986, p323) …"*concluded that most sand transported during moderate waves bypassed the head of Dume Submarine Canyon, but that during storms the canyon acts as a partial sediment sink.*"

Fate of Sand that Passes Point Dume

After about 250,000 cyy of sand passed Point Dume in recent years it was carried further east and deposited on the beach at Santa Monica and Venice. This amount was enhanced as it moved along the coast of Malibu as streams discharged sand from the Santa Monica Mountains and sea cliffs eroded. As a consequence, over 300,000 cyy reached Santa Monica and Venice. New beach was created in the lee of the Santa Monica Breakwater before the 1950s then later at Venice after the jetties at Marina del Rey were constructed in 1959. Almost five acres of additional beach area was, and continues to be, created each year.

REFERENCES

Coastal Frontiers, 1992, "Historical Changes in the Beaches of Los Angeles County", unpublished report prepared for Dept of Beaches and Harbors, Los Angeles County, 109p plus appendices.

DMJM, 1984, "Santa Monica Pier Reconstruction Project, Santa Monica, California, Phase I: Feasibility Analysis", Daniel, Mann, Johnson & Mendenhall draft report, v.1.

Everts, C.H., Dill, R.F., Jones, A., Lorensen, T., Kelly, K., and R.B. Wilkins, 1987, "Littoral Sand Losses to Scripps Submarine Canyon", Proceedings Coastal Sediments '87, ASCE speciality conference, p 1549-1562.

Everts, C.H., and C.D. Eldon, 2005, "Sand Capture in Southern California Submarine Canyons", Shore and Beach, v.73, n.1, p3-12.

Everts, C.H., and C.D. Eldon, 2010, "Groin impacts on beaches in southern California", Shore and Beach, v.78, n.4, p4-11.

Everts Coastal, 2011, "Historic Beach Performance, Causes of Beach Change, and Estimates of Future Beach Fill Requirements at Broad Beach, Malibu, California", unpublished report prepared for Moffatt Nichol, Long Beach, CA, 66p.

Everts Coastal, 2012, "Historic Beach Changes, Causes and Forecasts of Future Performance, NBVC, California", unpublished report prepared for Moffatt Nichol, Long Beach, CA,66p.

Handin, J.W., 1951, "The Source, Transportation and Deposition of Beach Sediments in Southern California", US Army Corps of Engineers Beach Erosion Board, Tech Memo 22, Washington, DC, 113p.

Jaykim Engineers (Inman, D.L., Guza, R.T., Skelly, D.W. and T.E. White writers), 1986, "Southern California Coastal Processes Data Summary", Report no. CCSTWS 86-1, US Army Corps of Engineers, Los Angeles District, 572 p.

Knur, R.T. and Y.C. Kim, 1999. Historical sediment budget analysis along the Malibu coastline. Sand Rights '99- Bringing Back the Beaches. Ventura, CA: ASCE. p 292.

Knur, R.T., 2011, "What's Left of the Malibu Coastline and a Method to Replenish the Beaches", Proceedings Coastal Engineering Practice 2011, p766-779.

Moffatt and Nichol Engineers (Everts, C.H. and R.F. Dill authors) 1988,"Sedimentation in Submarine Canyons, San Diego County, California, 1984-1987", Corps of Engineers Los Angeles District Report CCSTWS 88-2, 115p.

Moffatt and Nichol, Engineers (Everts, C.H., author), 1995, "Sand Loss Monitoring Program of Point Mugu Shoreline, US Naval Air Weapons Station, Point Mugu", unpublished report prepared for Fugro McClelland, Ventura, CA, 40p plus 3 appendices.

Orme, A.R. 1991. The Malibu coast- A contribution to the city-wide wastewater management study. City of Malibu and Philip Williams & Associates, 50 pp.

Reppucci, G.M., 2012, "Manhattan Beach, California: Width determination from a century of images", Shore and Beach, v.80, n.4. p29-37.

Shepard, F.P., and R.F. Dill, 1966, Submarine Canyons and Other Sea Valleys, Rand McNally, Chicago.

Taylor, B.D., 1983, "Sediment Yields in Coastal Southern California", ASCE Jour Hyd.Eng., v.109, n.1, January, p71-85.

1950, "Beach Erosion Control Report on Cooperative Study of Pacific Coast Line of the State of California, Point Mugu to San Pedro Breakwater", Army Corps of Engineers, Los Angeles District.

USACE-LAD, 1994, " Reconnaissance Report- Malibu/Los Angeles County Coastline. Los Angeles County, California", 222p (accretion rate east of Sunset Point referenced in Patch and Griggs, 2006; this report was not available for my evaluation).

AGENDA ITEM 8b.

Ehrlich, Kenneth A.

From: Boudreau, Russ [rboudreau@moffattnichol.com]
Sent: Thursday, January 31, 2013 2:56 PM
To: Zan Marquis (zan.marquis@gmail.com); Ehrlich, Kenneth A.
Subject: Emailing: Amd 11 BBGHAD Contract.pdf

Attachments: Amd 11 BBGHAD Contract.pdf

Amd 11 BBGHAD Contract.pdf (20...

Ken & Zan,

During the last GHAD board meeting, Ken and I were directed by Marshall to come up with a plan for M&N to reduce our subcontractor markup. Per our present contract, and same as our initial contract with the TPOA, we have an allowed markup of 10%. M&N proposes to remove all markup for work commencing after November 1, 2012 (and our November and December invoices have reflected this), and this will be applied to the existing Task 2 Field Investigations, Task 3 Project Entitlement and Task 5 Final Engineering.

At a later date when we commence with pre-construction, construction and post-construction services, we will wish to reinstate a reduced markup of 5% - that can be done/further negotiated at a later date when these tasks commence.

I understand from Ken that this will need to be addressed by the GHAD board, so I wanted to get this to you ahead of time. I will not be able to participate in the Feb 10 meeting, hopefully we can arrive as some general concurrence about this approach before that.

Russ

Your message is ready to be sent with the following file or link attachments:

Amd 11 BBGHAD Contract.pdf

moffatt & nichol

AMENDMENT TO AGREEMENT

AMENDMENT NO. 11

Project Name: Broad Beach Restoration Project

Project No.: 6935-02

THE AGREEMENT, dated November 6, 2011, between Broad Beach Geologic Hazard Abatement District (BBGHAD) and Moffatt & Nichol for services on the above named Project is hereby amended as follows:

1.0 SERVICES

None

2.0 CHARGES OR PAYMENTS

None.

3.0 OTHER AMENDMENTS

In *Exhibit B – Rate Schedule for Professional Services*, for *Subcontractor or Outside Services*, change rate from "*Cost + 10%*" to "*Cost*" – retroactive to November 1, 2012 and shall remain in effect for completion of all *Task 2 Field Investigations*, *Task 3 Project Entitlement* and *Task 5 Final Engineering & Construction Documents*.

Except as expressly amended herein, all provisions contained in the aforementioned Agreement and its Amendments shall remain in full force and effect and are hereby incorporated herein by this reference.

MOFFATT & NICHOL		BBGHAD	
By	James McCluskie	By:	
Title:	Business Unit Leader	Title:	
Date:		Date:	

AGENDA ITEM 11a.

Broad Beach GHAD
Cash Flow

Cash in Bank : 12/31/12		23,884.15
Sources of Cash:		
GHAD Assessment funds		1,320,357.77
Advances from Line of Credit		-
Invoices Paid thru 1/31/13	***Paid***	
Moffatt & Nichols	133,131.97	
Jeffer Mangels	57,904.35	
ENGEO	175.00	
State Lands Comm-Staff Costs	16,596.06	
State Lands Comm-Consulting Costs	38,034.33	
Colantuono & Levin	42.50	
Verizon	38.71	
Repayment of Loan Advances	1,043,000.00	
Bank charges/Int on Line of Credit	1,757.74	
Cash Paid Out		(1,290,680.66)
Cash Balance as of 1/31/13		53,561.26
Sources of Cash:		
Advances from Individual Homeowners		-
GHAD Assessment funds		
Advance from Line of Credit/Loan		
Current Payables in hand:		
ENGEO	675.00	
Moffatt & Nichol	122,697.06	
Jeffer Mangels	32,291.44	
State Lands Comm-Consulting Costs	29,968.09	
Verizon	38.52	
Repayment of Loan Advances		
Total Invoices Due		(185,670.11)
Estimated Cash on Hand - 2/6/13		(132,108.85)
Forecasted Invoices thru Feb		
Total Forecasted		-
Estimated Cash on Hand - 2/28/13		(132,108.85)

Broad Beach GHAD
Projection thru 12/31/13
AS of: 2/6/13

	Actuals Paid FS Transferred, 2011	Actuals Paid Nov 2011-Jan 2013	Projection Feb-13	Projection 2013	Totals
Uses:					
Expenses transfered from FS acct-2011					-
Moffatt & Nichols-Approved	1,569,530	172,702			1,742,232
Moffatt & Nichols-Projected		1,241,941	122,697	125,397	1,490,035
Moffatt & Nichols-Final Engr & Constr Documents/Bid		81,000		235,000	316,000
Moffatt & Nichols-Constr Support/Mgmt/Monitor/Surveys					-
Project Construction-Hard Cost					-
Project Construction-20% Contingency					-
GHAD Bond Legal					-
GHAD Bond Underwriting					-
Jeffer Mangels	346,060	791,383	32,291	430,000	1,599,734
ENGEO	49,867	58,428	675	6,262	115,232
Morgan, Miller & Blair	53,590	13,189			66,779
Bell,McAndrews & Hiltachk		2,500			2,500
Wendel Rosen	1,694	39,798			41,492
Colantuono & Levin, PC		7,520			7,520
PSOMAS		-			-
Fee-City of Malibu	17,584				17,584
Fee- Coastal Commission		40,000			40,000
Fee-Water Board		58,340			58,340
Fee-Fish & Game				7,172	7,172
Fee-Army Corp of Engr ?					-
Fee- LA County Fees for using Bulldozer on beach?					-
Fee- State Lands Commission additional Permit fees					-
State Lands Comm-Staff Costs	79,343	171,938		24,000	275,281
EIR Consultant- AMEC Earth & Environ	190,324	235,976	29,968	93,681	549,949
Quality Mapping	14,934	1,176			16,110
Topanga Underground	3,000	7,000			10,000
AON-E&O Insurance	6,286	7,509			13,795
Line of Credit-fee/costs/Interest		15,397		13,000	28,397
Office / Phone/Web Site/Coping/Transcripts		5,573	39	968	6,580
Accounting Administration		11,823		15,177	27,000
Soft Cost Contingency				100,000	100,000
Total Uses	2,332,212	2,963,192	185,670	1,050,657	6,531,731
Sources of Cash:					-
Advances from Individual Homeowners (Actuals)	1,580,278	1,436,750			3,017,028
Addtl Advances from Individual Revetment Homeowners	261,579				261,579
Advances from TPOA General Fund	550,000	200,000			750,000
Advance/Repayment - L of C/Loan (Bal-$3,000,000)		-			-
GHAD Bond					-
GHAD ASSESMENTS		1,320,358		1,967,316	3,287,674
Repayment of Advances to Homeowners					-
Repayment of Advances to TPOA General Fund					-
Total Sources	2,391,857	2,957,108	-	1,967,316	7,316,281
Cummulative Running Balance	59,645	53,561	(132,109)	784,550	784,550