CALIFORNIA COASTAL COMMISSION

SOUTH COAST AREA 5 W. BROADWAY, STE. 380 1.0. BOX 1450 LONG BEACH, CA 90802-4416 (310) 590-5071 Filed: September 9, 1997 49th Day: October 28, 1997 180th Day: March 8, 1998 Staff: John T. Auyong Staff Report: September 18, 1997 Hearing Date: October 7-10, 1997 Commission Action:

STAFF REPORT: REGULAR CALENDAR

APPLICATION NO.: 5-97-192

APPLICANT: City of Seal Beach

AGENT: Moffatt & Nichol Engineers

PROJECT LOCATION: East Beach (the public beach southeasterly of the Seal Beach municipal pier), City of Seal Beach, County of Orange.

PROJECT DESCRIPTION: Deposition of up to one hundred fifty thousand (150,000) cubic yards of sand on East Beach for beach nourishment purposes. The sand will be mined from an inland desert location, transported by train to the Seal Beach Naval Weapons Station, and delivered to nearby East Beach by earth moving equipment. Grunion runs will be avoided.

LOCAL APPROVALS RECEIVED: City of Seal Beach Negative Declaration 97-1 (adopted at the July 14, 1997 City Council meeting)

SUBSTANTIVE FILE DOCUMENTS: Coastal development permit 5-94-084 and amendment 5-94-084-A1; "The Winterization of Seal Beach" prepared for the City of Seal beach by Moffatt & Nichol, Engineers, October 1984; "Preliminary Economic Study for the Seal Beach Groin" prepared for the City of Seal Beach by Moffatt & Nichol, Engineers, June 1985; "Study of Alternatives to Reduce Coastal Flooding in Seal Beach" prepared for the City of Seal Beach by Moffatt & Nichol Engineers (M&N File 3104), June 1993; "Feasibility Study - Seal Beach Replenishment Project" prepared for the City of Beach and the California Department of Boating and Waterways by Moffatt & Nichol Engineers, revised July 1996; September 15, 1997 Biological Resources Summary for the Seal Beach Naval Weapons Station prepared by the Chambers Group for Moffatt & Nichol; Monitoring plan developed by Moffatt & Nichol dated August 26, 1997; Letter with attachments from Moffatt & Nichol to the City of Seal Beach dated July 16, 1997.

SUMMARY OF THE STAFF RECOMMENDATION - ISSUES TO BE RESOLVED

Staff is recommending approval of the proposed development with special conditions regarding (1) monitoring, (2) timing of construction of the project, (3) material suitability, (4) permission from the U.S. Navy to use their site for a portion of the proposed development, and (5) minimizing impacts to potential burrowing owl habitat. The primary issue to be resolved is the final determination from the U.S. Army Corps of Engineers regarding the suitability of the nourishment material.



PETE WILSON, Governor



STAFF RECOMMENDATION:

The staff recommends that the Commission adopt the following resolution:

I. <u>Approval with Conditions</u>.

The Commission hereby <u>grants</u> a permit, subject to the conditions below, for the proposed development on the grounds that the development, located between the nearest public roadway and the shoreline, will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976 including the public access and recreation policies of Chapter 3, will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3 of the Coastal Act, and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

- II. Standard Conditions.
- 1. <u>Notice of Receipt and Acknowledgment</u>. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
- 2. <u>Expiration</u>. If development has not commenced, the permit will expire two years from the date this permit is reported to the Commission. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
- 3. <u>Compliance</u>. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
- 4. <u>Interpretation</u>. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
- 5. <u>Inspections</u>. The Commission staff shall be allowed to inspect the site and the project during its development, subject to 24-hour advance notice.
- 6. <u>Assignment</u>. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
- 7. <u>Terms and Conditions Run with the Land</u>. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. Special Conditions.

- 1. <u>Monitoring</u>. The permittee shall implement and comply with the monitoring plan prepared by Moffatt & Nichol dated August 26, 1997. The post-construction report proposed to be submitted to the Coastal Commission shall include an analysis of the monitoring results and shall be submitted sixty days after the completion of construction. The final long-term monitoring survey proposed in the monitoring plan shall contain an analysis of the monitoring results and shall be submitted to the Coastal Commission within sixty days after the survey is completed. The Executive Director may, for good cause, grant a one-time extension to each of the two deadlines specified herein.
- 2. <u>Timing of Construction</u>. Placement of sand on the beach or in coastal waters shall not take place; (1) during grunion runs, whether preidentified on a grunion calendar or not, nor (2) during the peak summer season between, and including, the Memorial Day holiday weekend and the Labor Day holiday weekend.
- 3. <u>Material Suitability</u>. Prior to issuance of the coastal development permit, the applicant shall submit, for the review and approval of the Executive Director, a final written determination from the U.S. Army Corps of Engineers that the proposed desert sand beach nourishment material from the High Desert is suitable for use as beach nourishment material. Only beach nourishment material deemed suitable by the U.S. Army Corps of Engineers shall be used for beach nourishment. The permittee shall provide a qualified expert who will inspect the proposed beach nourishment material at its source to ensure that the nourishment material is consistent with the U.S. Army Corps of Engineers approval. The permittee shall ensure that none of the construction equipment (such as but not limited to train cars, sand spreaders, or earth-moving equipment) used to handle the proposed beach nourishment material contains metals, organic compounds, or other material which would contaminate the proposed nourishment material.
- 4. <u>Habitat Protection</u>. No construction equipment or material nor beach replenishment material shall be stored or stockpiled on burrowing owl habitat. The applicant shall install a silt fence around the perimeter of any site used for stockpiling to minimize impacts on burrowing owl habitat. Stockpiling or delivery of sand at the Seal Beach Naval Weapons Station shall not occur after January 15, 1998.
- 5. <u>Navy Permission</u>. Prior to issuance of the coastal development permit, the applicant shall submit, for the review and approval of the Executive Director, written permission from the U.S. Navy allowing the applicant to undertake the portion of the proposed development which would be located on the Seal Beach Naval Weapons Station.

IV. Findings and Declarations.

A. <u>Detailed Project Description</u>

The applicant is proposing to place up to one hundred fifty thousand (150,000) cubic yards of sand on East Beach for beach nourishment purposes. The City may elect to use less than 150,000 cubic yards in the event anticipated funding for the proposed project is inadequate to cover construction costs for the full 150,000 cubic yards. The sand source is located in the Mojave Desert, well outside the coastal zone. The sand would be mined from a relic river bed deposit located in Littlerock, near Palmdale and Lancaster (see Exhibit B). Samples of the sand proposed to be used indicate that; (1) no more than eight percent of the sand is comprised of fine-grained materials, and (2) the median grain size is 0.45 millimeters.

The sand would be transported by train to the Seal Beach Naval Weapons Station, adjacent to East Beach (see Exhibit A). Each train would pull forty rail cars, with each car carrying sixty cubic yards of material. The approximate weekly sand delivery rate would be 8,750 cubic yards, depending on the need for the Navy to use the rail lines.

The sand would be taken off the trains by conveyor belt and placed into earth-moving vehicles. Some of the sand may be temporarily stockpiled on the Naval Weapons station adjacent to the terminus of the train route (see Exhibit E). The vehicles would then drive over streets in the Naval Station to East Beach, where they will drive onto the beach and drop the sand continuously as they drive. Thus, the sand will be deposited in layers, as opposed to in piles and then spread out.

The proposed project would occur Mondays through Fridays, restricted to the hours between 7:00 a.m. to 8:00 p.m., over a period of approximately six to eight weeks. The applicant also proposes to avoid construction during grunion runs by consulting a grunion calendar which identifies expected dates of grunion runs.

B. <u>Previous Commission Action</u>

The Commission previously approved coastal development permit 5-94-084 for the placement of up to 150,000 cubic yards of sand on East Beach, in the same location as the proposed project. The sand used was from a dredging project in the Santa Ana River. The Commission subsequently approved amendment 5-94-084-A1 to; (1) change the sand source to a different part of the Santa Ana River, and (2) change the haul route from the I-405 freeway to Pacific Coast Highway (State Route One).

However, the City only placed less than 50,000 cubic yards of the approved 150,000 on the beach, as this was all that the City could afford financially at that time. Because the proposed sand replenishment material is not dredged material and would come from an entirely different source than the Santa Ana River, a new permit application was submitted rather than a second amendment to permit 5-94-084.

C. <u>Chapter 3 Policies</u>

1. Marine Resources - Water Quality

Section 30230 of the Coastal Act states:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 of the Coastal Act states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

a. <u>Turbidity Impacts</u>

Turbidity is a condition in which fine material (silts and clays, for example) is suspended in the water. Nearshore waters usually have some degree of turbidity because waves wash onshore material into the water. Turbid water is usually cloudy as a result of the suspended material. Therefore, excessively turbid water can prevent sight feeding birds from seeing their prey in the water. Fine material can also result in smothering of offshore habitat if the material drops out of suspension and onto sensitive areas. Therefore, turbidity often results in significant adverse impacts to marine resources.

The potential for turbidity resulting from the proposed project would depend on factors such as, but not limited to; (1) the similarity between the grain sizes of the existing beach sand and the proposed nourishment material, and (2) the amount of fine (i.e. very small) sized grain materials which are lighter and tend to wash away more easily.

The agent has indicated that the grain sizes of the existing beach sand and the proposed beach nourishment material consisting of desert sand are fairly similar. The percentage of fine grain materials in the existing beach sand is four percent (4%), while the percentage of fine grain materials in the proposed desert sand is eight percent (8%). The median grain size of the desert sand (0.45 millimeters) is slightly larger than the median grain size of the existing beach sand (0.34 millimeters). Relative to the existing beach sand, the desert sand contains a slightly greater percentage of fine grain material which may wash away. On the other hand, relative to the existing beach sand, the non-fine grain material of the desert sand would be slightly coarser (i.e. larger in size and heavier) than the non-fine grain material and thus be less likely to wash away.

Given both; (1) the overall low percentages of fines in both the existing beach sand and the proposed desert nourishment sand, and (2) the fact that both the existing beach sand and the proposed desert nourishment sand overall are both medium sized grains based on the median grain size, turbidity levels are expected to be low. The low percentage of fines and medium grain size would result in most of the sand staying on the beach and not becoming suspended in nearshore waters. Therefore, turbidity and its resultant impacts would not be expected to be a concern at this site.

Further, during periods of high surf such as in the winter, heavy wave action tends to churn up the existing sand and cause greater turbidity than times when wave action is not heavy. The proposed project would occur during the winter when wave action is generally at its highest and background (i.e. naturally occurring) turbidity is likely to be at its greatest. Some turbidity should be expected as a result of the proposed placement of the desert sand on the beach, given the fact that the desert sand has a small but measurable amount of fines. However, given the overall low levels of fines in the existing beach sand and the proposed desert sand nourishment material, any additional turbidity which may result from the proposed project would not likely result in a substantial increase in turbidity beyond naturally occurring levels. Therefore, additional turbidity from the proposed project could not be distinguished from existing levels and would not result in significant adverse impacts to marine resources.

In addition, the permit is also being conditioned for compliance with the proposed monitoring plan. The proposed monitoring plan contains criteria for verifying the proposed nourishment material at the source, to ensure that the correct sand is being delivered. While excessive turbidity is not expected as a result of the proposed project, the Commission finds that the proposed monitoring plan would provide valuable information regarding existing levels of turbidity as well as turbidity levels resulting from beach nourishment. The applicant has indicated that East Beach erodes at a rate of 6,000 cubic yards per year. Thus, the beach will have to be replenished periodically. The information provided by the proposed monitoring plan would be useful in evaluating future beach nourishment projects for adverse turbidity impacts. Therefore, the Commission finds that it is necessary for the applicant to submit the results of the proposed monitoring and an analysis of the results.

Finally, the California Regional Water Quality Control Board, Santa Ana Region ("RWQCB"), is responsible for determining whether a discharge into surface waters may be permitted under State and federal water codes. The RWQCB has determined that the proposed discharge of beach nourishment material into the waters off of East Beach would be consistent with the Minor Stream Channel Alterations criteria of RWQCB Resolution 96-9. The RWQCB thus wrote a letter to the City dated August 21, 1997 waiving discharge requirements for the proposed project based on conformance with Resolution 96-9.

Therefore, the Commission finds that the proposed development, as conditioned, would be consistent with Sections 30230 and 30231 of the Coastal Act.

b. <u>Suitability of Materials</u>

To minimize adverse impacts to the biological productivity of coastal waters, any material proposed for beach nourishment must be deemed suitable for such use. The Commission has in the past accepted U.S. Army Corps of Engineers ("ACOE") determinations of material suitability (see permits E-96-22 and 6-96-116). In this case, the ACOE has verbally indicated to the applicant that the proposed beach nourishment material would not likely contain substances toxic to marine life or human health because the source of the proposed nourishment material is not located near any toxic substance sites. However, the applicant has not provided written confirmation of the ACOE determination.

Further, while it appears that the proposed nourishment material is within the ACOE criteria that the percentage of fines in nourishment material be within ten percent of the percentage of fines of existing sand at the receiver beach (i.e. the beach at which the nourishment material would be placed), the applicant has not provided a written determination by the ACOE that this is indeed the case.

Therefore, the permit is being conditioned for the submittal of a written ACOE determination that the proposed nourishment material is suitable for use as beach nourishment material. Further, the permit is being conditioned to ensure that only sand which meets with ACOE approval is used. In addition, the permit is being conditioned to require the applicant to provide an inspector at the source of the nourishment material to ensure that only approved sand is delivered to the beach. Thus, as conditioned, the Commission finds the proposed development to be consistent with Sections 30230 and 30231 of the Coastal Act.

c. <u>Impacts to Grunions</u>

Grunion fish use the beach to spawn. Grunion spawning periods are commonly referred to as "grunion runs". The placement of nourishment material on the beach during grunion runs would smother the grunions and result in adverse impacts. The applicant is proposing to avoid grunion runs based on grunion runs pre-identified in a grunion calendar. However, climatic changes or other factors may unexpectedly change the conditions which cause grunions to spawn, thus potentially causing unexpected grunion runs not pre-identified.

It is important to ensure that impacts to grunions are minimized. Therefore, the proposed development is being conditioned so that placement of nourishment material on the beach does not occur during grunion runs, whether pre-identified or not. Thus, the Commission finds the proposed development, as conditioned, to be consistent with Section 30230 of the Coastal Act.

2. <u>Public Access - Recreation</u>

Section 30210 of the Coastal Act states:

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

The proposed development would have temporary adverse impacts on public access and recreation. This is due to closure of the portions of the beach being nourished. Closure of the beach would eliminate sandy area from being used by the public for access and/or recreation. Further, although the proposed beach nourishment material is coarser than the existing beach sand, the potential may exist for the proposed development to result in temporary turbid water, as described earlier. The cloudiness of turbid water can act as a psychological deterrent to beachgoers from entering the water, as well as obscure visibility for divers.

However, the proposed project would result in longer term positive impacts by increasing the size of beach and therefore the amount of sandy area available for public recreation and public access. The temporary adverse impacts on public access and recreation due to beach closure can be mitigated by ensuring that the proposed project does not occur during peak beach usage periods. Therefore, the proposed project is being conditioned so that construction does not occur during the summer season between the Memorial Day and Labor Day Holiday weekends.

In addition, no public parking lots would be partially or completely closed in conjunction with the proposed project. The public bikeway which runs between the beach and homes along East Beach would also not be closed as a result of the proposed project.

As described in the Marine Resources section of this report, significant levels of turbidity are not expected to occur. Therefore, adverse turbidity impacts on public access and public recreation should not result. However, the permit is also being conditioned for compliance with the proposed monitoring program.

Therefore, the Commission finds that, as conditioned, the proposed development would be consistent with Section 30210 of the Coastal Act.

3. Environmentally Sensitive Habitat Area

Section 30240 of the Coastal Act states:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The subject site on the Seal Beach Naval Weapons Station ("NWS") to be used for possible stockpiling of beach nourishment material is disturbed. However, it contains potential habitat for the burrowing owl, a California Species of Special Concern. A biological assessment dated September 15, 1997 and prepared by the Chambers Group recommends that activities related to the sand storage area should be conducted prior to January 15, 1998. Further, the assessment recommends that a silt fence should be installed around the perimeter of the stockpile area, to minimize impacts to the burrowing owl habitat.

These recommendations have been made conditions of the permit for the proposed project. Further, the permit has been conditioned for the avoidance of storing construction equipment or stockpiling beach nourishment material on burrowing owl habitat. Therefore, the Commission finds that, as conditioned, the proposed project would be consistent with Section 30240 of the Coastal Act.

4. <u>Hazards</u>

Section 30253 of the Coastal Act states, in relevant part:

New development shall: (1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

East Beach, the site of the proposed beach replenishment, is particularly susceptible to flood hazards due to wave uprush. This is because the beach is fairly narrow. In fact, the Commission has consistently imposed assumption-of-risk deed restrictions for new development fronting on East Beach. The proposed development would result in the widening of East Beach (see Exhibit C, page 2). This would result in additional protection for the homes fronting onto East Beach by reducing the potential for wave uprush to reach the beachfront homes. The proposed development would thus minimize risks of damage to beachfront homes due to wave uprush.

Further, beach nourishment is a preferred alternative to seawalls or other structural shoreline protection measures which can lead to beach erosion. Therefore, the Commission finds that the proposed development would be consistent with Section 30253 of the Coastal Act.

5. <u>Visual Impacts</u>

Section 30251 of the Coastal Act states, in part:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.

Since the mid 1960's, the City of Seal Beach each winter has moved sand on East Beach into a temporary berm adjacent to the homes fronting on East Beach (see 1984 Moffatt and Nichol study - page 3). This pre-Coastal activity is used as a last line of defense against the wave uprush hazards described above. However, the berm is high enough so as to block public views of the beach down the street-ends in the area.

The proposed development would widen the beach, thus lessening the need for the temporary berm as a wave uprush protection measure. The proposed development would reduce the need to build the temporary sand berm, thereby reducing potential future blockage of public views to the beach.

Further, the proposed beach nourishment material, while slightly darker than the existing beach sand, would not contrast starkly with the existing sand. Thus, the Commission finds that the proposed development would be consistent with Section 30251 of the Coastal Act.

D. <u>Authority to Undertake Development</u>

Section 30601.5 of the Coastal Act requires an applicant to demonstrate a legal interest in property on which development would be undertaken or, if the applicant has no legal interest, secure permission from the underlying property owner to undertake a proposed development. The proposed beach nourishment material would be delivered to the U.S. Naval Weapons Station ("NWS"), where it would be transferred to earth-moving equipment for delivery to the deposition site. Some stockpiling of the material would also occur on the NWS. Since the City as applicant does not have a legal interest in the site, the City must submit written permission from the Navy to use the NWS for the proposed project. Therefore, the permit is being conditioned for the submittal of this permission.

E. Local Coastal Program

Section 30604(a) of the Coastal Act provides that the Commission shall issue a Coastal Development Permit only if the project will not prejudice the ability of the local government having jurisdiction to prepare a Local Coastal Program which conforms with the Chapter Three policies of the Coastal Act.

On July 28, 1983, the Commission denied the City of Seal Beach Land Use Plan (LUP) as submitted and certified it with suggested modifications. The City did not act on the suggested modifications within six months from the date of Commission action. Therefore, pursuant to Section 13537(b) of the California Code of Regulations, the Commission's certification of the land use plan with suggested modifications expired. The LUP has not been resubmitted for certification since that time.

The proposed development, as conditioned, is consistent with the Chapter Three policies of the Coastal Act. Therefore, the Commission finds that the proposed development would not prejudice the ability of the City to prepare a certified local coastal program consistent with the Chapter Three policies of the Coastal Act.

F. <u>California Environmental Quality Act</u>

Section 13096 of Title 14 of the California Code of Regulations requires Commission approval of Coastal Development Permits to be supported by a finding showing the permit, as conditioned, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(i) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment.

The proposed development is located in an urban area. The proposed project has been conditioned in order to be found consistent with the development policies regarding parking of Chapter Three of the Coastal Act. Mitigation measures requiring; (1) monitoring, (2) timing of construction of the project, (3) material suitability, (4) permission from the U.S. Navy to use their site for a portion of the proposed development, and (5) minimizing impacts to potential burrowing owl habitat, will minimize all significant adverse impacts.

As conditioned, there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

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Monitoring Plan
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MEMORANDUM

- TO: JOHN AUYONG, STAFF ANALYST, CALIFORNIA COASTAL COMMISSION
- FROM: CHRIS WEBB
- DATE: AUGUST 26, 1997

SUBJ: SEAL BEACH REPLENISHMENT PROJECT - MONITORING PROGRAM

CC: STEVE BADUM, CITY OF SEAL BEACH

The monitoring program proposed by the City is presented below. Please understand that this work is the maximum effort envisioned, and that the City may determine that a reduced effort is appropriate depending on coastal conditions after construction.

A beach profile monitoring program is proposed to evaluate the performance of the beach nourishment at East Beach. Monitoring will record the evolution of the beach replenishment to evaluate project performance, and aid in assessing the need for renourishment. The monitoring program is proposed as three stages: pre-construction monitoring, construction monitoring, and long-term monitoring. Pre-construction monitoring will document the condition of the beach prior to any placed sediment, developing the "baseline condition" of: 1) position of the existing berm, 2) slope of the nearshore region, and 3) existing sediment characteristics. Construction monitoring will verify the quality of sand delivered and that material is placed in the proper disposal location. Surveys will be conducted upon completion of the project to monitor the postfill condition of East Beach and to help identify the fate of the beach fill sand.

Monitoring the entire Seal Beach littoral subcell could be done to track the fate of the sand. However, the retention of sand by the Pier Groin may result in a large portion of the fill remaining east of the Pier. Therefore, this program proposes measurements to be taken only at East Beach.

Phase I includes Pre- and Post-Construction monitoring. Phase II consists of long-term monitoring.

Phase I

Pre-Construction Monitoring

1. Perform hydrographic surveying prior to the commencement of construction at East Beach.

26/97

COASTAL COMMISSION 5-97-192 Monitoring Plan NO. 157 EXHIBIT # _____ PAGE _____ OF ____

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A total of five dry beach / wading profiles will be taken at Neptune Avenue (the West Anaheim Bay Jetty), Dolphin, 13th, 11th, and 9th Streets (west side of the groin). These locations correspond with the U.S. Army Corps of Engineers (USACE) historic survey locations. The land profiles will be referenced to known survey vertical benchmarks and will extend from the boardwalk out to a depth of approximately -3 fect relative to Mean Lower Low Water (MLLW). Hydrographic surveys utilizing a survey grade recording fathometer and survey grade Global Positioning System will be recorded over the entire East Beach offshore region. Readings will be taken at high tide. Offshore surveys will extend from approximately -3 to -30 feet Mean Lower Low Water, or 3,000 feet offshore whichever is encountered first.

2. Obtain sediment samples at each of the 5 land survey profiles.

Samples will be taken in 6 foot elevation increments from + 6 feet MLLW down to - 30 feet MLLW. Samples will be taken from the sand surface by a grab-sampling method. Sediments will be analyzed for gradation.

3. Photograph the existing shoreline position.

The existing shoreline will be regularly photographed to record its condition prior to beach filling.

Construction Monitoring

1. Inspect loading at the high desert source location. Inspection will occur to verify that the agreed upon quality of sediment is delivered. Sieve analyses will also be performed.

2. Photograph and videotape construction techniques.

Construction techniques will be documented for City records.

3. Record one set of surveys and samples

Surveying and sampling will be done identical to that described in for pre-construction monitoring items 1 and 2 immediately upon conclusion of the nourishment project.

4. Submit a post-construction report.

The report will detail the monitoring results to the City, and a copy will be forward to the Coastal Commission.

Phase II

Long-Term Monitoring

1. Perform long-term monitoring.

Long-term monitoring can occur for a minimum of one season, a year or several years, depending on the desired level of detail of results. The most comprehensive effort would include a total of 6 beach measurements to be taken after the post-construction surveys.

Monthly surveys will be taken for two months, followed by three quarterly surveys. The final long-term monitoring survey will occur approximately one year from the completion

2. Obtain sediment samples.

One sediment sampling profile will be taken at 13th Street taken by the method described in Phase I.

3. Obtain photographs.

Photographs of the beach condition will also be taken as described in Phase I.

of construction. The surveys will include surveys as described in Phase I.

5-97-192

COASTAL COMMISSION Monitoring Plan EXHIBIT #_____ PAGE ______ OF _____

3

