CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
710 E STREET • SUITE 200
EUREKA, CA 95501-1865
VOICE (707) 445-7833
FACSIMILE (707) 445-7877

W18a

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Commission Action:	

STAFF REPORT: REGULAR CALENDAR

APPLICATION NO.:	**1-07-010**
APPLICANT:	**Humboldt Bay Harbor, Recreation, & Conservation District**
PROJECT LOCATION:	Within Shelter Cover Harbor, along the existing beach access road between Machi Road and the harbor, and on "lot MMM" near the Shelter Cover air strip (for equipment and materials staging), Humboldt County (APNs 108-171-23 & 111-181-01)
PROJECT DESCRIPTION:	Rehabilitation in place and maintenance of the approximately 420-foot-long rock breakwater by (1) placing approximately 5,190 tons of imported rock on the breakwater to build it back up to its original (1970s) footprint, (2) performing periodic maintenance of the breakwater by placing additional rock as needed, (3) performing periodic resurfacing of the launch ramp access road, (4) performing periodic repair of the boat launch ramp by replacing damaged sections as needed, and (5)

	performing periodic dredging of accumulated sand from the inner leg of the breakwater (anticipated to be up to 2,000 cubic yards every five years).
LOCAL APPROVALS RECEIVED:	None required
OTHER APPROVALS RECEIVED:	State Lands Commission Lease PRC 1956.9 (25-year lease expires May 31, 2034)
OTHER APPROVALS REQUIRED:	(1) Federal Clean Water Act Section 401 Certification (NCRWQCB WDID No. 1B0702WNHU) (pending); (2) Federal Clean Water Act Section 404 Permit (ACOE File No. 2007-00717N) (pending); (3) King Range Area of Special Biological Significance Ocean Plan Exception (pending from the State Water Resources Control Board).
SUBSTANTIVE FILE DOCUMENTS:	(1) CDP File No. NCR-78-C-306 (approved December 1978 for, in part, improvements to the existing breakwater and reconstruction and paving of the beach access road and boat launching ramp); (2) CDP File No. 1-83-65A (approved April 1983 for, in part, additional repairs to the breakwater, access road, and boat launch ramp); (3) Draft and Final Environmental Impact Reports for the Shelter Cove Breakwater Rehabilitation Project (August and October 2006, respectively) (SCH No. 2005042024); (4) Humboldt County Local Coastal Program

SUMMARY OF STAFF RECOMMENDATION:

Staff recommends approval with special conditions of the proposed Shelter Cove Breakwater Rehabilitation Project. The proposed project involves three primary components: (1) the rehabilitation of the existing breakwater, and future routine maintenance repairs on the breakwater; (2) repairs to and repaving of the existing launch ramp apron and beach access road, and future routine maintenance repairs on these areas; and (3) periodic maintenance dredging of the boat launch area and disposal of the dredged materials.

Shelter Cove is located approximately 25 miles west of Highway 101 at Garberville, at the southwestern end of Humboldt County, on California's "Lost Coast" (Exhibit No. 1). Despite its remote location, Shelter Cove is a popular sport-fishing destination. Fishing is most common during late spring through mid-fall when the cove is protected from the common northwest winds and waves and the best conditions for launching and offshore moorage occur.

Shelter Cove is a hook-shaped bay, with Point Delgada as the upcoast (western) limit and rocky outcroppings near Dead Man's Gulch approximately one-half mile to the southeast as the downcoast (eastern limit). The cove faces south, and its location, sheltered by Point Delgada, makes it an important refuge from the predominantly northwesterly winds and seas in the area. In fact, Shelter Cove harbor is the only harbor of refuge from the common northwesterly winds and seas between Noyo Harbor at Fort Bragg and Humboldt Bay at Eureka.

Shelter Cove is part of the King Range Area of Special Biological Significance (ASBS). The State Water Resources Control Board, under Resolution No. 74-28, has designated 34 coastal and offshore island sites as ASBS to date, and these areas are monitored and maintained for water quality by the Board. ASBS are so designated because they support an unusual variety of aquatic life and often host unique individual species. The King Range ASBS extends the length of the King Range from Punta Gorda in the north to south of Point Delgada near the Humboldt/Mendocino County line.

The Shelter Cove Boat Launching Facility, which the applicant has managed since the late 1970s, includes a beach access road, concrete boat launch ramp, turnaround area, utilities, and low-rock breakwater. Prior to the Harbor District involvement, the beach launch area had been used by local commercial and sport fishermen. The breakwater was originally constructed in the early 1970s along the alignment of a naturally occurring rocky offshore reef. The Commission issued at least four permits or permit amendments in the late 1970s and throughout the 1980s for repair and maintenance of the Shelter Cove Boat Launching Facility, including repairs to the breakwater, beach access road, and boat launch ramp area, and authorization of bluff stabilization (rock slope protection) at the base of the bluff behind the beach adjacent to the breakwater.

The purpose of the existing breakwater is to create a harbor for boaters to launch and

retrieve their boats. Boats can be self launched at the concrete launch ramp by backing the boat down to the water via the ramp. Alternatively, bigger boats can be carried by high clearance tractors operated by a local boat launching business into the deeper water. As sand has accumulated within the breakwater protected area over time, the harbor has become shallower.

The breakwater is oriented to protect the harbor from both northwest and south swells. The existing breakwater consists of native and local beach rocks and concrete construction debris (see Exhibit No. 3). As the breakwater has settled and lost rocks over the years (since its completion in the late 1970s), it currently is under water at high tides. This settlement and corresponding wave overtopping greatly reduces the breakwater's effectiveness in protecting the launch facility, and boat launching is unstable at times.

The proposed project would rehabilitate in-place the existing breakwater to restore its effectiveness. The project would repair the breakwater in essentially its current configuration to provide similar dimensions, level of protection, and protected area as it did originally, prior to its deterioration to its current condition. The breakwater would be built out incrementally. Specifically, after completing a section from shore, imported crushed rock (or possibly smaller rocks that have sloughed off the breakwater) would be used to construct an accessible path on top of the proposed 11-foot-wide crest of the breakwater, allowing tired or tracked equipment to place rock at the end of the new section to repeat the incremental construction process in the next section outward. Detailed project plans are included as Exhibit No. 4.

The construction duration, including mobilization and weather delays, is estimated to be approximately five months and would take place between September 15 and May 15. The actual work on the breakwater is estimated to take less than two months. Work on the breakwater would be conducted during low tides for accessibility purposes. To allow a reasonable execution and completion of the project, work would potentially need to be conducted during night-time low tides, which would require the use of portable high-intensity lighting and heavy equipment for placing rock on the breakwater. Equipment needed for the project includes a loader, excavator, and possibly a crane.

In addition to the breakwater rehabilitation, the proposed project also involves periodic maintenance dredging of the boat launch area. This would consist essentially of scraping the protected area while exposed during low tides to remove occasional and sporadic accumulated sand shoals. This maintenance requirement is estimated at approximately 2,000 cubic yards every five years, or less than six inches of deposition per year within the deeper portion of the protected area. Accumulated sand removal would be accomplished at low tides while the bottom is not submerged using equipment such as a loader, excavator, or blade to move the excess sand from the protected area of the breakwater to the other (west) side of the breakwater, within the high-tide zone adjacent to the small "pocket beach" (see Exhibit No. 3) The applicant believes that this transfer of dredged material would bypass the sediment transport obstacle created by the breakwater, allowing the bypassed sediment to be picked up gradually by the high tides and transported offshore in the currents.

The portions of the overall proposed development including rehabilitation of the existing breakwater and repair of the existing boat launch apron and access road constitute a repair and maintenance project, because they involve rehabilitating the existing breakwater, boat launch apron, and access road back to their original and/or previously permitted configuration. Staff recommends Special Condition Nos. 1 through 5 to require (1) adherence to various construction responsibilities to protect coastal resources; and (2) submittal of a final sedimentation and runoff control plan, hazardous materials management plan, and debris disposal plan. Staff believes that with the inclusion of these special conditions, the proposed rehabilitation work is consistent with Coastal Act Sections 30230, 30231, 30232, and 30233.

Staff evaluated the proposed maintenance dredging and disposal component of the project as "new" development, where for analysis purposes, staff found that the proposed dredging is allowable under the limitations imposed by Coastal Act Sections 30230, 30231, and 30233. Staff believes that the proposed dredging is permissible under Section 30233(a)(2) of the Coastal Act for "*Maintaining existing, or restoring previously dredged, depths in…boat launching ramps*." Furthermore, staff believes that there is no less environmentally damaging feasible alternative to the development as conditioned, as required by Section 30233(a). Moreover, staff recommends Special Condition Nos. 1 through 6 to avoid significant adverse impacts on sensitive fish species, water quality, and intertidal biological communities associated with dredging activities and dredged material disposal. In particular, Special Condition No. 6 requires that the applicant submit a revised maintenance dredging and disposal plan that demonstrates, in part, that: (1) dredged material determined to be unsuitable for beach replenishment based on the grain size compatibility standards and/or contaminant concentration thresholds specified must be hauled off-site for disposal at an authorized upland disposal location, and (2) the placement of suitable dredged materials at the proposed beach receiving site shall not adversely impact adjacent intertidal biological communities. Finally, staff believes that the proposed maintenance dredging activities, as conditioned, are consistent with Section 30233(b) of the Coastal Act, which directs that dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation, and dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

In conclusion, staff believes that the proposed project, as conditioned, is consistent with all applicable Chapter 3 policies of the Coastal Act. **The Motion to adopt the Staff Recommendation of Approval with Conditions is found below on page 6.**

STAFF NOTES:

1. Standard of Review

The proposed project area is bisected by the boundary between the retained coastal development permit jurisdiction of the Commission and the coastal development permit jurisdiction delegated to Humboldt County by the Commission through the County's certified Local Coastal Program. The boundary lies at the mean high tide line of the harbor, with the Commission's jurisdiction lying seaward of the line and the County's lying landward of the line.

The Coastal Act was amended by Senate Bill 1843 in 2006, effective January 1, 2007. The amendment added Section 30601.3 to the Coastal Act. Section 30601.3 authorizes the Commission to process a consolidated coastal development permit application when agreed to by the local government, the applicant, and the Executive Director for projects that would otherwise require coastal development permits from both the Commission and from a local government with a certified LCP. In this case, the Humboldt County Board of Supervisors adopted a resolution, both the applicants and the County submitted letters requesting consolidated processing of the coastal development permit application by the Commission for the subject project, and the Executive Director has authorized the consolidated processing on behalf of the Commission.

The policies of Chapter 3 of the Coastal Act provide the legal standard of review for a consolidated coastal development permit application submitted pursuant to Section 30601.3. The local government's certified LCP may be used as guidance.

I. MOTION, STAFF RECOMMENDATION AND RESOLUTION:

The staff recommends that the Commission adopt the following resolution:

MOTION:

I move that the Commission approve Coastal Development Permit No. 1-07-010 pursuant to the staff recommendation.

STAFF RECOMMENDATION OF APPROVAL:

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

RESOLUTION TO APPROVE THE PERMIT:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment.

II. STANDARD CONDITIONS: See Appendix A.

III. SPECIAL CONDITIONS:

1. Timing of Construction

(A) Construction activities, including future maintenance dredging activities authorized by this permit, shall be conducted during the period of September 15 through May 15, or for such additional time that the Executive Director may permit for good cause, to minimize conflicts with commercial and recreational fisheries and to protect sensitive fish species; and

(B) All construction activities and future maintenance dredging activities within coastal waters authorized under this coastal development permit shall be conducted during periods of low-tides only, above the water surface (except for the replacement of breakwater rock below the water surface), to minimize the generation of suspended sediment and potential water quality impacts.

2. Construction Responsibilities

The permittee shall comply with the following construction-related requirements:

(A) Construction methods shall conform to those described in Finding IV-C "Project Description" – specifically, the breakwater rehabilitation shall be conducted from land and shall be built out incrementally, with construction equipment working from the crest of the newly restored breakwater. No access path, whether temporary or permanent, shall be created along the inner or outer side of the breakwater for construction purposes;

(B) No construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wave, wind, or rain erosion and dispersion. Construction materials shall be stored only in approved designated staging and stockpiling areas;

(C) Public roadway surfaces adjacent to the construction entrances shall be swept at the end of each day to remove sediment and/or other construction materials deposited due to construction activities, to prevent such sediment and/or materials from contaminating coastal waters or other environmentally sensitive habitat areas;

(D) Any and all debris resulting from construction activities shall be removed from the breakwater and adjacent beach areas on a daily basis and disposed of at an appropriate location(s);

(E) Any fueling and maintenance of construction equipment shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas. Mobile fueling of construction equipment and vehicles on and

around the breakwater construction site shall be prohibited. Mechanized heavy equipment and other vehicles used during the construction process shall not be stored or re-fueled within 50 feet of drainage courses and other coastal waters;

(F) Temporary staging and storage of construction machinery, equipment, debris, and other materials during the construction period shall occur at "lot MMM" owned by the Resort Improvement District adjacent to the airstrip, and may not occur on the breakwater or adjacent beaches;

(G) Machinery and construction materials not essential for project improvements are prohibited at all times in the subtidal or intertidal zones;

(H) Construction vehicles shall be maintained and washed in confined areas specifically designed to control runoff and located more than 100 feet away from the mean high tide line;

(I) Floating booms shall be used to contain debris discharged into coastal waters, and any debris discharged shall be removed as soon as possible but no later than the end of the each day;

(J) During construction, all trash shall be properly contained, removed from the work site, and disposed of on a regular basis to avoid contamination of habitat during restoration activities. Following construction, all trash and construction debris shall be removed from work areas and disposed of properly;

(K) Fuels, lubricants, and solvents shall not be allowed to enter the coastal waters. Hazardous materials management equipment including oil containment booms and absorbent pads shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call; and

(L) At the end of the construction period, the permittee shall inspect the project area and ensure that no debris, trash, or construction material remain on the beach, breakwater, or in the water, and that the project has not created any hazard to navigation.

3. <u>Final Sedimentation & Runoff Control Plan</u>

(A) **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010**, the applicant shall submit, for the review and written approval of the Executive Director, a final detailed Sedimentation & Runoff Control Plan that addresses all phases of development and construction activities authorized under this coastal development permit.

(1) The Sedimentation and Run-off Control Plan shall demonstrate that:

(a) Run-off from the project site shall not increase sedimentation in coastal waters;

(b) Run-off from the project site shall not result in pollutants entering coastal waters;

(c) Best Management Practices (BMPs) shall be used to prevent the entry of polluted stormwater runoff into coastal waters during the construction of the authorized structures, including, but not limited to, the use of relevant best management practices (BMPs) as detailed in the "California Storm Water Best Management Practice Handbooks (Construction and Industrial/ Commercial), developed by Camp, Dresser, & McKee *et al*. for the Storm Water Quality Task Force (e.g., BMP Nos. EC-1–Scheduling, SE-1–Silt Fence &/or SE-9–Straw Bale Barrier, NS-9–Vehicle & Equipment Fueling, NS-10–Vehicle & Equipment Maintenance & Repair; NS-14–Material Over Water, NS-15–Demolition Adjacent to Water, WM-1–Material Delivery & Storage, WM-3–Stockpile Management, WM–Spill Prevention & Control, WM-6–Hazardous Waste Management, WM-9–Concrete Waste Management, SC-11–Spill Prevention, Control, & Cleanup, and others; see www.cabmphandbooks.com).

(2) The Sedimentation and Run-off Control Plan shall include, at a minimum, the following components:

(a) A schedule for the installation and maintenance of appropriate *construction source control* best management practices (BMPs) to prevent entry of stormwater run-off into the construction site and the entrainment of excavated materials into run-off leaving the construction site; and

(b) A schedule for installation, use and maintenance of appropriate BMPs to prevent the entry of polluted stormwater run-off *from the completed development* into coastal waters.

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

4. Hazardous Materials Management Plan

(A) **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010**, the applicant shall submit, for the review and written approval of the Executive Director, a plan to reduce impacts to water quality from the use and management of hazardous materials on the site. The plan shall be prepared by a licensed engineer with experience in hazardous materials management. The plan shall address all phases of development and construction activities authorized under this coastal development permit. The Hazardous Materials Management Plan, at a minimum, shall provide for the following:

(1) Equipment fueling shall occur only during daylight hours in designated fueling areas;

(2) Oil absorbent booms and/or pads shall be on site at all times during project construction. All equipment used during construction shall be free of oil and fuel leaks at all times;

(3) Provisions for the handling, cleanup, and disposal of any hazardous or non-hazardous materials used during the construction project including, but not limited to, paint, asphalt, cement, equipment fuel and oil, and contaminated sediments;

(4) A schedule for maintenance of containment measures on a regular basis throughout the duration of the project;

(5) Provisions for the containment of rinsate from the cleaning of equipment and methods and locations for disposal off-site. Containment and handling shall be in upland areas and otherwise outside of any environmentally sensitive habitat areas;

(6) A site map detailing the location(s) for hazardous materials storage, equipment fueling and maintenance, and any concrete wash-out facilities; and

(7) Reporting protocols to the appropriate public and emergency services agencies in the event of a spill.

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

5. <u>Debris Disposal Plan</u>

(A) **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010**, the applicant shall submit, for the review and written approval of the Executive Director, a plan for the disposal of excess construction-related debris, including excess concrete and material from the rehabilitation of the breakwater and repairs to beach access road and launch ramp area. The plan shall describe the manner by which the material will be removed from the construction site and shall identify a disposal site that is in an upland area where materials may be lawfully disposed.

(B) The permittee shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development.

6. <u>Revised Maintenance Dredging & Disposal Plan</u>

(A) **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010**, the applicant shall submit, for the review and written approval of the Executive Director, a revised Maintenance Dredging and Disposal Plan for the

proposed periodic maintenance dredging of the boat launch area. The revised plan shall substantially conform with the plan submitted to Commission staff on August 11, 2009 and included as Exhibit No. 6, except that it shall be revised to include the following:

(1) The revised Maintenance Dredging and Disposal Plan shall demonstrate that:

(a) Prior to each dredging event, dredged materials shall be tested for concentrations of contaminants as directed in the California Ocean Plan for the King Range ASBS;

(b) If the dredged material samples are determined to contain contaminant concentrations above the limitations set by the State Water Resources Control Board or are determined to be unsuitable for beach replenishment based on the stated grain size compatibility standards, the dredged materials must be hauled off-site for disposal at an authorized upland disposal location;

(c) Dredged materials that are determined to be unsuitable for beach replenishment based on the stated grain size compatibility standards and above contaminant standards shall not be temporarily placed or stored on area beaches or where they may be subject to entering coastal waters;

(d) Dredging activities shall occur only during the period of September 15 through May 15 and during periods of low tides, consistent with Special Condition No. 1; and

(e) The placement of suitable dredged materials at the proposed beach receiving site shall not adversely impact adjacent intertidal biological communities.

(2) The revised Maintenance Dredging and Disposal Plan shall include, at a minimum, the following components:

(a) A list of contaminants to be tested in the dredged materials and the maximum limits for each to allow for spoils disposal at the proposed receiving site;

(b) A description of proposed sampling methods;

(c) Provisions for submittal within 30 days of placement of suitable dredged materials at the proposed beach receiving site a summary report that details, at a minimum, the following information: (a) the amount of material dredged, (b) the date and approximate time of the dredging, (c) a map showing the approximate limits of the harbor area that was dredged, (d) sampling methods and results for the grain size analysis and contaminant analysis; (e) name and qualifications of person(s) conducting the dredged material sampling; (f) the amount of dredged materials placed on the beach receiving area and/or hauled

off-site for disposal at an authorized upland facility; and (g) a map showing the dredged materials deposition location.

(d) A Biological Monitoring and Reporting Plan designed by a qualified marine biologist to assess and report any changes to species diversity and abundance in the adjacent intertidal biological communities resulting from the placement of suitable dredged materials at the proposed beach receiving site;

(e) A schedule of proposed maintenance dredging activities and/or explanation of threshold values to be monitored to determine the need for maintenance dredging.

(B) If the results of the approved biological monitoring and reporting protocol indicate that the dredging disposal on the proposed receiving beach has adversely impacted the species diversity and/or abundance of adjacent intertidal biological communities based on the goals and objectives set forth in the approved plan, the permittee shall submit a revised or supplemental Maintenance Dredging & Disposal Plan to either (1) relocate the dredged material receiving area to a suitable location that will not have significant adverse effects on species diversity, intertidal biological communities, or other coastal resources, or (2) provide for disposal at an authorized upland disposal site. The revised plan shall be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

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

7. <u>Public Access Plan</u>

(A) **PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010**, the applicant shall submit, for the review and written approval of the Executive Director, a Public Access Plan to maintain reasonable use of the cove area beaches by the public during all phases of development and construction activities authorized under this coastal development permit:

(1) The Public Access Plan shall demonstrate that reasonable use of the beach access road and cove beaches shall be maintained for pedestrians for the duration of the construction period, except for those areas under active construction and those areas used for the staging and transport of active construction equipment working on the authorized development;

(2) The Public Access Plan shall include, at a minimum, the following components:

(a) A site plan showing areas of restricted public access and areas that will be maintained for public pedestrian access; and

(b) A narrative description of proposed access control measures and methods to restrict public access in active construction areas while maintaining reasonable use of the beach access road and cove beaches by pedestrians for the duration of the construction period.

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

8. Exterior Lighting Standards

All exterior lights used during nighttime construction activities and/or installed in the project area shall be the minimum wattage necessary for accomplishing nighttime construction work, non-reflective, shielded, and have a directional cast downward such that no light will shine beyond the boundaries of the construction area or significantly into the cove or surrounding beaches.

9. Assumption of Risk

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

10. Regional Water Quality Control Board Approval

PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010, the applicant shall provide to the Executive Director a copy of a Water Quality Certification or other approval issued by the North Coast Regional Water Quality Control Board, or evidence that no approval is required. The applicant shall inform the Executive Director of any changes to the project required by the Regional Board. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

11. State Water Resources Control Board Approval

PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT NO. 1-07-010, the applicant shall provide to the Executive Director a copy of an Ocean Plan Exception or other approval issued by the State Water Resources Control Board, or evidence that no

approval is required. The applicant shall inform the Executive Director of any changes to the project required by the State Board. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

12. U.S. Army Corps of Engineers Approval

PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, the permittee shall provide to the Executive Director a copy of a permit or other approval issued by the Army Corps of Engineers, or evidence that no permit or other approval is required. The applicant shall inform the Executive Director of any changes to the project required by the Corps. Such changes shall not be incorporated into the project until the applicant obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

13. Length of Development Authorization for Ongoing Routine Repair and Maintenance to the Breakwater and Maintenance Dredging & Disposal

Development authorized by this permit is valid for five (5) years from the date of Commission approval (until October 7, 2014). One request for an additional five-year period of development authorization may be accepted, reviewed and approved by the Executive Director for a maximum total of ten (10) years of development authorization, provided the request would not substantively alter the project description, and/or require modifications of conditions due to new information or technology or other changed circumstances. The request for an additional five-year period of development authorization shall be made prior to October 7, 2014. If the request for an additional five-year period would substantively alter the project description, and/or require modifications of conditions due to new information or technology or other changed circumstances, an amendment to this permit will be necessary.

IV. FINDINGS & DECLARATIONS

The Commission hereby finds and declares as follows:

A. Background

The applicant has been involved in the management of the Shelter Cove Boat Launching Facility since the late 1970s. The facility includes a beach access road, boat launch ramp, turnaround area, utilities, and the breakwater. Prior to the Harbor District involvement, the beach launch area had been used by local commercial and sport fishermen. A low-rock breakwater was originally constructed in the early 1970s along the alignment of a naturally occurring rocky offshore reef. The Commission issued at least four permits or permit amendments in the late 1970s and throughout the 1980s for repair and maintenance of the Shelter Cove Boat Launching Facility, including repairs to the breakwater, beach access road, and boat launch ramp area, and authorization of bluff

stabilization (rock slope protection) at the base of the bluff behind the beach adjacent to the breakwater.

The purpose of the existing breakwater is to create a harbor for boaters to launch and retrieve their boats. The breakwater is oriented to protect the harbor from both northwest and south swells. The existing breakwater consists of native and local beach rocks and concrete construction debris (see Exhibit No. 3). Rocks over four feet in diameter have largely remained in place, although some settling has occurred. Smaller rocks used in the original breakwater construction have largely become displaced as a result of wave action. As the breakwater has settled and lost rocks over the years (since its completion in the late 1970s), it currently is under water at high tides. This settlement and corresponding wave overtopping greatly reduces the breakwater's effectiveness in protecting the launch facility, and boat launching is unstable at times. At public meetings held by the Harbor District over the past 10 years or so, improving the breakwater to increase public safety and boating access has been the expressed overriding interest.

Boats can be self launched at the concrete launch ramp by backing the boat down to the water via the ramp. Alternatively, bigger boats can be carried by high clearance tractors operated by a local boat launching business into the deeper water. As sand has accumulated within the breakwater protected area over time, the harbor has become shallower. At high tide, boats can usually be launched close to the concrete ramp. At low tide, however, boats must be launched from further out, closer to the outer end of the breakwater.

In 2006 the applicant completed an Environmental Impact Report (EIR) for the rehabilitation of the Shelter Cove breakwater, which explored three alternatives (in addition to the "no project" alternative: (1) repairing the breakwater in its original footprint to restore its effectiveness (i.e., the option proposed under this permit application); (2) repairing the breakwater and extending its outer leg by an additional 80 feet to enhance protection of the boat launching ramp; and (3) extending the inner leg of the breakwater by an additional 80 feet and realigning the outer leg of the breakwater at a right angle to increase the size of the protected area. Alternative 3 was the alternative favored by many in the fishing community because it would enable several boats at a time to wait within the protected breakwater area (and out of the peril of rough waves) for the opportunity to be hauled in, whereas currently there is room enough for only one boat to wait within the protected breakwater area to be hauled in. Alternative 1, which is the alternative proposed under this coastal development permit application, was the alternative favored by many in the surfing community because it would not impact wave conditions near Wash Rock, though the alternative would not provide for additional boat mooring within the protected area as would Alternative 3. Alternative 2 was generally the least favorable option because it would impact wave conditions near Wash Rock and would adversely affect navigational safety at the tip of the breakwater (though it would provide additional protection to the boat launch area). The "no project" alternative, though it would avoid all potential environmental impacts associated with the proposed project, would result in a significant adverse impact to boating and fisheries resources, due to the continued diminishment of the breakwater's effectiveness expected to occur

over time with increased settling of rocks and damage by wave action. Therefore, this alternative was found not to be the preferred alternative in the EIR. The EIR determined Alternative 1 (i.e., the proposed project) to be the least environmentally damaging and most cost-effective alternative.

B. Environmental Setting

Shelter Cove is located approximately 25 miles west of Highway 101 at Garberville, at the southwestern end of Humboldt County, on California's "Lost Coast" (Exhibit No. 1). The unincorporated community ranges from the coastal plateau of Point Delgada at sea level up to approximately 2,500 feet in elevation (Exhibit No. 2). The terrain in the area is steep, rugged, and vegetated primarily with coastal prairies, Douglas-fir forest, and chaparral communities.

Shelter Cove is largely characterized by hundreds of small, residential lots (resulting from a series of subdivisions approved in the 1960s), many of which are vacant and many of which are unbuildable due to geologic hazard constraints. The Shelter Cove plateau is the most developed part of the community, containing nearly all of the lodging facilities, restaurants, campground, deli, airstrip, golf course, boating facilities (storage yard, equipment shed, and towing tractors), and much of the developed residential property. The economy of the area is based primarily on seasonal recreational visitors and a small number of commercial fishermen who work out of Shelter Cove.

Many visitors to Shelter Cove, including an increasing number of retirees, take advantage of the airstrip located in the center of the plateau to fly into the area on private planes for daytrips to fish or golf (see Exhibit No. 3). For visitors who choose to drive to the community, the trip takes approximately one hour by vehicle from Highway 101 at Garberville along narrow, windy, steep, rough roads for much of the way.

Shelter Cove is at the southern limit of the community and features the breakwater, drivable hard-packed sand, and a shoreline border of high bluffs (Exhibit Nos. 2 and 3). Shelter Cove is a hook-shaped bay, with Point Delgada as the upcoast (western) limit and rocky outcroppings near Dead Man's Gulch approximately one-half mile to the southeast as the downcoast (eastern limit). The cove faces south, and its location, sheltered by Point Delgada, makes it an important refuge from the predominantly northwesterly winds and seas in the area. In fact, Shelter Cove harbor is the only harbor of refuge from the common northwesterly winds and seas between Noyo Harbor at Fort Bragg and Humboldt Bay at Eureka. During westerly and southerly storms, however, waves diffract around Point Delgada and move unimpeded into the cove, making beach access precarious.

Despite its remote location, Shelter Cove is a popular sport-fishing destination. Recreational fishermen either reside in the Shelter Cove community, haul in boats on trailers along the approximately 25 miles of steep, narrow, windy roads from Highway 101 at Garberville, or use the available charter boat services in the area. Fishing is most common during late spring through mid-fall when the cove is protected from the common

northwest winds and waves and the best conditions for launching and offshore moorage occur.

A relatively steep, paved access road running down the bluff above the cove from the plateau is used to access the boat launch area and adjacent beaches (see Exhibit No. 3). A small beach occupies the area between the base of the bluff and the inward end of the breakwater and serves as an informal parking area for a small number of vehicles to avoid high tide. This informal parking area is about 3,000 square feet in size and can accommodate approximately 10 vehicles with trailers (though fewer vehicles can be accommodated at high tides). A beach extending eastward for approximately 0.5-mile or more along the north end of the cove from the boat launching area to Dead Man's Gulch is a popular public beach for beachcombing, sightseeing, surfing access (surfing is popular near Wash Rock, located about 180 feet northeast from the tip of the existing breakwater, and at Dead Man's Gulch), and other passive recreational uses. A small beach also lies to the west of the boat launching area that is popular for tide-pooling and sightseeing. According to the coastal engineering analysis prepared for the project (Exhibit No. 5), existing sand on this "pocket beach" has resulted from sediment transport over the breakwater, since the breakwater has settled over time and is overtopped at high tide. The beach does not extend far beyond where the breakwater connects to shore.

Shelter Cove is part of the King Range Area of Special Biological Significance (ASBS). The State Water Resources Control Board, under Resolution No. 74-28, has designated 34 coastal and offshore island sites as ASBS to date, and these areas are monitored and maintained for water quality by the Board. ASBS are so designated because they support an unusual variety of aquatic life and often host unique individual species. The King Range ASBS extends the length of the King Range from Punta Gorda in the north to south of Point Delgada near the Humboldt/Mendocino County line.

The breakwater itself supports habitat for a diversity of marine algal, invertebrate, and fish species. Species diversity tends to be higher along the outer (seaward) side of the breakwater compared to the inward side. According to a 2004 biological inventory completed by the applicant, the seaward-side community is similar to assemblages found at nearby natural outer-coast, moderately exposed sites. Biodiversity on the inward side is believed to be decreased due to sand accumulation and scour. Organisms on the inward side of the breakwater were characteristic of protected high intertidal areas. No species of concern were located during the inventory.

In contrast to nearby rocks along Point Delgada, the breakwater is only lightly visited by birds such as gulls and oystercatchers. Harbor seals swim near the breakwater, but they do not haul out there, and they are much more numerous in nearby areas to the west along Point Delgada. The nearest small rocks used by harbor seals for hauling out are about 500 feet south of the breakwater. Additionally, a large haul out rock lies approximately 1,200 feet south of the breakwater. Stellar sea lions occur nearshore off the exposed side of Point Delgada, outside of the cove. The sea lions tend not to enter the cove and are not known to haul out or form rookeries on or near the breakwater.

C. Project Description

The proposed project is to rehabilitate in-place the existing breakwater to restore its effectiveness. The project would repair the breakwater in essentially its current configuration to provide similar dimensions, level of protection, and protected area as it did originally, prior to its deterioration to its current condition. Detailed project plans are included as Exhibit No. 4.

The project would involve creating a base layer of 6-inch rocks in places, an underlayer of quarter-ton to half-ton quarry rock, and an outer armor layer of 3-ton to 5-ton quarry rock. The breakwater rehabilitation would be conducted from land, because the wave climate is too rough for construction from a barge.

The breakwater would be built out incrementally. Specifically, after completing a section from shore, imported crushed rock (or possibly smaller rocks that have sloughed off the breakwater) would be used to construct an accessible path on top of the proposed 11-foot-wide crest of the breakwater, allowing tired or tracked equipment to place rock at the end of the new section to repeat the incremental construction process in the next section outward.

The current footprint area of the existing breakwater is approximately 12,680 square feet. This footprint area excludes rocks that have been dispersed by waves, so it is smaller than the original footprint. The rehabilitated breakwater would have a footprint of approximately 17,080 square feet, an increase of 4,400 square feet, or 35 percent, over the existing eroded breakwater condition, but no larger than the original footprint of the breakwater. The project would not increase the size of the protected area.

New rock to be used in the breakwater rehabilitation would be obtained from one or more permitted sources, most likely a local quarry because of the cost advantage of shorter transportation distances. Some of the rock that has sloughed off the breakwater would be retrieved and reused in the breakwater repair if possible. The total amount of imported rock is estimated at approximately 5,190 tons.

The construction duration, including mobilization and weather delays, is estimated to be approximately five months and would take place between September 15 and May 15. The actual work on the breakwater is estimated to take less than two months. Work on the breakwater would be conducted during low tides for accessibility purposes. To allow a reasonable execution and completion of the project, work would potentially need to be conducted during night-time low tides, which would require the use of portable high-intensity lighting and heavy equipment for placing rock on the breakwater. Equipment needed for the project includes a loader, excavator, and possibly a crane.

The crest of the inner leg of the breakwater would taper up from its current shore elevation of approximately +4.5 feet (NGVD29) to +9.5 feet as the leg progresses outward from shore, which is similar to the condition that existed in 1979. The purpose

for keeping the breakwater low near the beach is to avoid interrupting the long shore transport of sediment over the breakwater toward Point Delgada, while not diminishing the protection from waves. The outer leg of the breakwater would also have a crest elevation of +9.5 feet (NGVD29) for protection against waves by preventing overtopping under normal conditions, which would interrupt the small amount of sediment currently leaking out of the basin through and over the low-crested outer leg resulting in an increase, possibly a doubling, in the sediment accumulation rate in the protected area and concomitant increase in the need for occasional maintenance dredging over the existing deteriorated condition of the breakwater.

Maintenance of the boat launch area would consist essentially of scraping the protected area while exposed during low tides to remove occasional and sporadic accumulated sand shoals. This maintenance requirement is estimated at approximately 2,000 cubic yards every five years, or less than six inches of deposition per year within the deeper portion of the protected area. Accumulated sand removal would be accomplished at low tides while the bottom is not submerged using equipment such as a loader, excavator, or blade to move the excess sand from the protected area of the breakwater to the other (west) side of the breakwater, within the high-tide zone adjacent to the small "pocket beach" (see Exhibit No. 3) The applicant believes that this transfer of dredged material would bypass the sediment transport obstacle created by the breakwater, allowing the bypassed sediment to be picked up gradually by the high tides and transported offshore in the currents. Maintenance sediment removal is expected to be occasional and sporadic, based largely on episodes of ocean conditions that create a fairly sudden accumulation of sand on the northeast side of the breakwater. As described above, the proposed rehabilitation of the breakwater is designed to allow for continued sediment flow over the inner leg of the breakwater.

In addition, the applicant proposes to conduct periodic, routine maintenance repairs on the breakwater due to damage caused by extreme waves. It is estimated that wave damage will occur to 5 percent to 10 percent of the armor layer on average every 10 years. This estimated maintenance would require 110 tons to 220 tons of 5-ton plus armor rock every 10 years. It is anticipated that such repairs could be completed quickly, within a few days of work, because the amount of rock involved would be small, and there would be ready access to the breakwater. Maintenance would be conducted using the same methods described above for initial rehabilitation and would be conducted during low tides only between September 15 and May 15.

Finally, the proposed project also includes repairing the launch ramp apron where the concrete surface has been damaged and repairing and repaving the access road (which currently has an asphalt concrete surface). These repairs would occur after the breakwater rehabilitation is completed, and then occasionally as maintenance work. Repairing the launch ramp would consist of cutting out and replacing damaged sections or patching damaged concrete as needed. Repairing the access road would consist of patching and resurfacing damaged portions of the road, repaving the road as necessary, repairing the existing fencing and guardrail along the access road as necessary (i.e., if damaged by vehicles), and replacing or repairing existing signage along the access road, as necessary.

As discussed above, maintenance would occur during low tides (for repairs to the launch ramp) and only between September 15 and May 15. A concrete saw would be used to cut out rebar and concrete in damaged areas. The damaged rebar would be removed and replaced. A cement truck would be used to pour the new asphalt concrete. An estimated 100 square feet of concrete would be replaced as part of this project.

The applicant proposes to use "lot MMM" (APN 111-181-01), located on the plateau adjacent to the airstrip and the golf course, as a staging area for construction equipment and materials (see Exhibit Nos. 3 and 4). The proposed staging area, owned by the Resort Improvement District, consists of an undeveloped grassy field.

D. Permit Authority, Extraordinary Methods of Repair & Maintenance

Coastal Act Section 30610(d) generally exempts from Coastal Act permitting requirements the repair or maintenance of structures that does not result in an addition to, or enlargement or expansion of, the structure being repaired or maintained. However, the Commission retains authority to review certain extraordinary methods of repair and maintenance of existing structures that involve a risk of substantial adverse environmental impact as enumerated in Section 13252 of the Commission regulations. Section 30610 of the Coastal Act provides, in relevant part, the following:

> *Notwithstanding any other provision of this division, no coastal development permit shall be required pursuant to this chapter for the following types of development and in the following areas: . . .*
>
> *(d) Repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the object of those repair or maintenance activities; provided, however, that if the commission determines that certain extraordinary methods of repair and maintenance involve a risk of substantial adverse environmental impact, it shall, by regulation, require that a permit be obtained pursuant to this chapter.* [Emphasis added]

Section 13252 of the Commission administrative regulations (14 CCR 13000 *et seq*.) provides, in relevant part, the following (emphasis added):

> *(a) For purposes of Public Resources Code section 30610(d), the following extraordinary methods of repair and maintenance shall require a coastal development permit because they involve a risk of substantial adverse environmental impact:…*
>
> *(3) Any repair or maintenance to facilities or structures or work located in an environmentally sensitive habitat area, any sand area, within 50 feet of the edge of a coastal bluff or environmentally sensitive habitat area, or within 20 feet of coastal waters or streams that include:*
>
> *(A) The placement or removal, whether temporary or permanent, of rip-rap, rocks, sand or other beach materials or any other forms of solid materials;*
>
> *(B) The presence, whether temporary or permanent, of mechanized equipment or construction materials.*
>
> *All repair and maintenance activities governed by the above provisions shall be subject to the permit regulations promulgated pursuant to the Coastal Act, including but not limited to the regulations governing administrative and emergency permits. The*

> *provisions of this section shall not be applicable to methods of repair and maintenance undertaken by the ports listed in Public Resources Code section 30700 unless so provided elsewhere in these regulations. The provisions of this section shall not be applicable to those activities specifically described in the document entitled Repair, Maintenance and Utility Hookups, adopted by the Commission on September 5, 1978 unless a proposed activity will have a risk of substantial adverse impact on public access, environmentally sensitive habitat area, wetlands, or public views to the ocean.…*

The proposed project involves three primary components: (1) the rehabilitation of the existing breakwater, and future routine maintenance repairs on the breakwater; (2) repairs to and repaving of the existing launch ramp apron and beach access road, and future routine maintenance repairs on these areas; and (3) periodic maintenance dredging of the boat launch area and disposal of the dredged materials. The portions of the overall proposed development including rehabilitation of the existing breakwater and repair of the existing boat launch apron and access road constitute a repair and maintenance project, because they involve rehabilitating the existing breakwater, boat launch apron, and access road back to their original and/or previously permitted configuration. As discussed above in Finding IV-C "Project Description," the current footprint area of the existing eroded breakwater is approximately 12,680 square feet. This footprint area excludes rocks that have been dispersed by waves, so it is smaller than the original footprint. The rehabilitated breakwater would have a footprint of approximately 17,080 square feet, an increase of 4,400 square feet, or 35 percent, over the existing eroded breakwater condition, but no larger than the original footprint. The project would not increase the size of the protected area.

Although certain types of repair projects are exempt from coastal development permitting requirements, Section 13252 of the regulations requires a CDP for extraordinary methods of repair and maintenance enumerated in the regulation. The proposed development involves the placement of construction materials and removal and placement of solid materials within coastal waters and directly within and adjacent to environmentally sensitive habitat. Therefore, the proposed project requires a coastal development permit under Sections 13252(a)(3) of the Commission's regulations.

In considering a permit application for a repair or maintenance project pursuant to the above-cited authority, the Commission reviews whether the proposed *method* of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act. The Commission's evaluation of such repair and maintenance projects does not extend to an evaluation of the conformity with the Coastal Act of the underlying existing development.

The repair and maintenance of the breakwater and boat launch ramp could have adverse impacts on coastal resources, in the case of this permit primarily coastal waters and marine resources, if not properly undertaken with appropriate mitigation. The applicant proposes to minimize impacts to coastal resources in part by (1) designing all new sources of exterior lighting to avoid impacts on navigation and to protect nighttime views, including the night sky, to the extent practicable; (2) designing the project to avoid

unanticipated expansion of the breakwater footprint in the seaward direction and impacting vegetated intertidal rocks; (3) preparing a hazardous materials management plan to address the transport, handling, and storage of fuels and other equipment fluids, with emphasis on preventing releases to the ocean or beach, and to address spill prevention, cleanup, and disposal; and (4) preparing a traffic management plan that in part ensures that reasonable traffic flow and onsite landing use by recreational and commercial fishermen, surfers, and other users will be maintained during construction activities.

Although various measures proposed by the applicant to minimize adverse impacts to coastal resources are appropriate, additional measures are also needed to further avoid, as necessary, or minimize impacts to water quality, coastal waters, public access, and visual resources. The conditions required to meet this standard are discussed in the Findings in the following sections.

E. Protection of Coastal Waters & Water Quality

1. Applicable Coastal Act Policies and Standards

Section 30230 of the Coastal Act states the following:

> *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 30231of the Coastal Act states the following (emphasis added):

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

Section 30232 of the Coastal Act states the following:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containments and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

Section 30233 of the Coastal Act states the following (emphasis added):

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible*

mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

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

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

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

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

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

(6) Restoration purposes.

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

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

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary…

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

2. Consistency Analysis

Coastal Act Sections 30230 and 30231 require in part that marine resources and coastal waters and wetlands be maintained and enhanced. These policies also call for restoration of marine resources, coastal waters, streams, wetlands, and estuaries where feasible. Additionally, Section 30230 calls for "*special protection*" to be given to "*areas of special biological significance*." As mentioned above in Finding IV-B "Environmental Setting," Shelter Cove is part of the King Range Area of Special Biological Significance (ASBS), one of 34 ASBS in the state designated to date. Coastal Act Section 30232 requires protection against the spillage of crude oil, gas, petroleum products and hazardous

substances and requires that effective containments and cleanup procedures be provided for accidental spills that do occur.

The proposed project involves three primary components: (1) the rehabilitation of the existing breakwater, and future routine maintenance repairs on the breakwater; (2) repairs to and repaving of the existing launch ramp apron and beach access road, and future routine maintenance repairs on these areas; and (3) periodic maintenance dredging of the boat launch area and disposal of the dredged materials. The Commission evaluates the first two project components under the "repair and maintenance" provisions described above in Finding IV-D, where the Commission reviews whether the proposed method of repair or maintenance is consistent with the Chapter 3 policies of the Coastal Act (see Subsection (a) below). The Commission evaluates the third project component as "new" development, where for analysis purposes, the Commission must find that the proposed periodic maintenance dredging is allowable under the limitations imposed by Coastal Act Sections 30230, 30231, and 30233, as explained in more detail below in Subsection (b).

(a) ***Rehabilitation of the Existing Breakwater & Repairs to the Launch Ramp Apron and Access Road***

The proposed development is located within Shelter Cove harbor. The breakwater rehabilitation work involves placing rock within coastal waters with the use of heavy equipment. The use of construction equipment and materials within sensitive marine and beach habitats could lead to habitat contamination and impacts through the discharge of debris, trash, and contaminants such as leaky gas and other fluids and sediment- and other pollutant-laden runoff. Allowing such debris or pollutants to enter the ocean could adversely affect water quality and marine organisms inconsistent with Coastal Act Sections 30230, 30231, and 30232. Similarly, the proposed repairs to the launch apron and beach access road also will involve the use of heavy equipment in close proximity to coastal waters, including the use of concrete.

As summarized above, Coastal Act Section 30231 protects the quality of coastal waters, streams, and wetlands through, among other means, controlling runoff. Sediment-laden runoff from a project work site, upon entering coastal waters, increases turbidity and adversely affects fish and other sensitive aquatic species. Sediment is considered a pollutant that affects visibility through the water and affects plant productivity, animal behavior (such as foraging) and reproduction, and the ability of animals to obtain adequate oxygen from the water. In addition, sediment is the medium by which many other pollutants are delivered to aquatic environments, as many pollutants are chemically or physically associated with the sediment particles.

In addition, as discussed above, Coastal Act Section 30232 requires protection against the spillage of crude oil, gas, petroleum products and hazardous substances and requires that effective containments and cleanup procedures be provided for accidental spills that do occur. The applicant has proposed to prepare a hazardous materials management plan to address the transport, handling, and storage of fuels and other equipment fluids, with

emphasis on preventing releases to the ocean or beach, and to address spill prevention, cleanup, and disposal. To date, however, no such plan has been prepared.

Given that the proposed construction methods and activities (1) will be located within and adjacent to coastal waters and beaches and thus could cause an increase in sediment and other pollutants entering coastal waters and other sensitive habitats through either the release of polluted runoff from the project site and/or leaky equipment contaminating coastal waters and beaches, and (2) are located, in part, within a designated Area of Special Biological Significance, which warrants "special protection" under Coastal Act Section 30230, the Commission finds it necessary to attach Special Condition Nos. 1 through 5, as described below.

- **Special Condition No. 1** in part requires that all construction activities within coastal waters authorized under the permit shall be conducted during periods of low-tides only to minimize suspended sediment and potential water quality impacts.
- **Special Condition No. 2** requires adherence to various construction responsibilities including, but not limited to, the following: (a) construction methods shall conform to those described in Finding IV-C "Project Description," specifically, the breakwater rehabilitation shall be conducted from land and shall be built out incrementally, with construction equipment working from the crest of the newly restored breakwater (which will allow marine organisms inhabiting the existing breakwater to continue to have habitat available in areas of the breakwater not being worked on); (b) no construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wave, wind, or rain erosion and dispersion; (c) public roadway surfaces adjacent to the construction entrances shall be swept at the end of each day to remove sediment and/or other construction materials deposited due to construction activities, to prevent such sediment and/or materials from contaminating coastal waters or other environmentally sensitive habitat areas; (d) any and all debris resulting from construction activities shall be removed from the breakwater and adjacent beach areas on a daily basis and disposed of at an appropriate location(s); (e) any fueling and maintenance of construction equipment shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas; mobile fueling of construction equipment and vehicles on and around the breakwater construction site shall be prohibited; mechanized heavy equipment and other vehicles used during the construction process shall not be stored or re-fueled within 50 feet of drainage courses and other coastal waters; (f) construction vehicles shall be maintained and washed in confined areas specifically designed to control runoff and located more than 100 feet away from the mean high tide line; (g) floating booms shall be used to contain debris discharged into coastal waters, and any debris discharged shall be removed as soon as possible but no later than the end of the each day; (h) during construction, all trash shall be properly contained, removed from the work site, and disposed of on a regular basis to avoid contamination of habitat during restoration activities; (i) hazardous materials management equipment including oil containment booms and absorbent

pads shall be available immediately on-hand at the project site, and a registered first-response, professional hazardous materials clean-up/remediation service shall be locally available on call; and (j) at the end of the construction period, the permittee shall inspect the project area and ensure that no debris, trash, or construction material remain on the beach, breakwater, or in the water.

- **Special Condition No. 3** requires submittal of a final Sedimentation and Runoff Control Plan, which shall demonstrate that (a) run-off from the project site shall not increase sedimentation in coastal waters; (b) run-off from the project site shall not result in pollutants entering coastal waters; and (c) Best Management Practices (BMPs) shall be used to prevent the entry of polluted stormwater runoff into coastal waters during the construction of the authorized structures.
- **Special Condition No. 4** requires submittal of a final Hazardous Materials Management Plan, which, at a minimum, shall provide for the following (a) equipment fueling shall occur only during daylight hours in designated fueling areas; (b) oil absorbent booms and/or pads shall be on site at all times during project construction, and all equipment used during construction shall be free of oil and fuel leaks at all times; (c) provisions for the handling, cleanup, and disposal of any hazardous or non-hazardous materials used during the construction project including, but not limited to, paint, asphalt, cement, equipment fuel and oil, and contaminated sediments; (d) a schedule for maintenance of containment measures on a regular basis throughout the duration of the project; (e) provisions for the containment of rinsate from the cleaning of equipment and methods and locations for disposal off-site; (f) a site map detailing the location(s) for hazardous materials storage, equipment fueling and maintenance, and any concrete wash-out facilities; and (g) reporting protocols to the appropriate public and emergency services agencies in the event of a spill.
- **Special Condition No. 5** requires submittal of a final Debris Disposal Plan, which provides for the disposal of excess construction-related debris, including excess concrete and material from the rehabilitation of the breakwater and repairs to beach access road and launch ramp area. The plan shall describe the manner by which the material will be removed from the construction site and shall identify a disposal site that is in an upland area where materials may be lawfully disposed.

In conclusion, the Commission finds that as conditioned to require (1) adherence to various construction responsibilities to protect coastal resources; and (2) submittal of a final sedimentation and runoff control plan, hazardous materials management plan, and debris disposal plan, the proposed development is consistent with Coastal Act Sections 30230, 30231, 30232, and 30233.

(b) ***Periodic Maintenance Dredging & Disposal***

The project proposes to maintain the boat launch area by essentially scraping the protected area while exposed during low tides to remove occasional and sporadic accumulated sand shoals. This maintenance requirement is estimated at approximately 2,000 cubic yards every five years, or less than six inches of deposition per year within

the deeper portion of the protected area. Accumulated sand removal will be accomplished at low tides while the bottom is not submerged using equipment such as a loader, excavator, or blade to move the excess sand from the protected area of the breakwater to the small sandy area of the beach within the high-tide zone adjacent to the west side of the breakwater. Therefore, the Commission finds that the proposed project involves both "dredging" and "filling" within coastal waters.

When read together as a suite of policy directives, Sections 30230, 30231, and 30233 of the Coastal Act set forth a number of different limitations on what types of projects may be allowed in coastal wetlands and waters. For analysis purposes, the limitations applicable to the subject project can be grouped into four general categories or tests. These tests require that projects that entail the dredging, diking, or filling of wetlands and waters demonstrate that:

1. That the purpose of the filling, diking, or dredging is for one of the seven uses allowed under Section 30233;
2. That the project has no feasible less environmentally damaging alternative;
3. That feasible mitigation measures have been provided to minimize adverse environmental effects; and
4. That the biological productivity and functional capacity of the habitat shall be maintained and enhanced, where feasible.

Each category is discussed separately below.

1. Permissible Use for Dredging and Filling in Coastal Waters

The first test set forth above is that any proposed filling, diking, or dredging in coastal waters and wetlands must be for an allowable purpose as specified under Section 30233 of the Coastal Act. The relevant category of use listed under Section 30233(a) that relates to the proposed maintenance dredging is subcategory (2), "*Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps*."

As discussed previously, boating facilities at Shelter Cove include, among other things, the breakwater, which was constructed to create a harbor for boaters to launch and retrieve their boats, and a concrete launch ramp, which was also constructed to allow boaters to self-launch their boats by backing the boat down to the water. As sand has accumulated behind the breakwater over time, the harbor has become shallower. At high tide, boats can usually be launched close to the concrete ramp. At low tides, however, boats have to be launched from further out, closer to the outer end of the breakwater.

Under the breakwater's current deteriorated condition, which has resulted from the settling and loss of rocks over time, sand and sediment are transported over the breakwater at higher tides. As previously discussed, this has resulted in the formation of the small "pocket beach" located west of the breakwater. Once the breakwater is rehabilitated back to its original footprint as proposed, such sediment transport over the

breakwater will be lessened. This will result in sediment accumulation within the harbor area and the anticipated need for maintenance dredging (estimated at approximately 2,000 cubic yards ever five years, or less than 6 inches of deposition per year).

As the applicant proposes to dredge the existing launch ramp area for the purpose of improving boat launch operations, the Commission therefore concludes that the proposed project is permissible under Section 30233(a)(2) for "*Maintaining existing, or restoring previously dredged, depths in…boat launching ramps.*"

Section 30233(b) of the Coastal Act directs that dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. The policy further directs that dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems. As explained in more detail below under "Feasible Mitigation Measures," the Commission finds that proposed placement of dredged material on area beaches, as conditioned, conforms to this provision.

2. Alternatives Analysis

The second test set forth by the Commission's dredging and fill policies is that the proposed dredging or fill project must have no feasible less environmentally damaging alternative. Coastal Act Section 30108 defines "feasible" as follows:

> *"Feasible" means capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, social, and technological factors.*

Alternatives to the proposed project that were examined include (1) the "no-project" alternative; (2) dredging a greater or lesser amount than proposed; and (3) alternative disposal sites. As explained below, each of these alternatives analyzed in the alternatives analysis are infeasible and/or do not result in a project that is less environmentally damaging than the proposed project:

a. <u>"No-Project" Alternative</u>

The "no project" alternative would entail that no maintenance dredging of the accumulated sediments within the Shelter Cove harbor boat launch area be undertaken. With no dredging, there would be no impacts from dredging and no impacts from disposal. However, without maintenance dredging, the boat launch area would eventually silt in to the point that it no longer could be used for commercial fishing vessels or recreational boating. The launch ramp would likely be forced to close, and the boaters who currently use the site would be displaced. As discussed above, Shelter Cove has been used for commercial and recreational fishing for decades, and it provides the only harbor of refuge from the common northwesterly winds and seas between Noyo Harbor at Fort Bragg and Humboldt Bay at Eureka. As discussed previously, commercial fishing and recreational boating are given high priority under the Coastal Act, and the Coastal Act policies call for the protection of these uses and the facilities needed to continue these uses. Therefore, the Commission finds that the no project alternative is <u>not</u> a feasible less

environmentally damaging alternative to the proposed project, as conditioned.

b. Dredging a Greater or Lesser Amount than Proposed

The applicant proposes to dredge approximately 2,000 cubic yards of material over a five year period for maintenance purposes. Dredging is proposed to be conducted from shore at low tide using loader, excavator, or blade to move the excess sand from the protected area of the breakwater to the other (west) side of the breakwater, within the high-tide zone adjacent to the small "pocket beach." Maintenance sediment removal is expected to be occasional and sporadic, based largely on episodes of ocean conditions that create a fairly sudden accumulation of sand on the northeast side of the breakwater (although the proposed rehabilitation of the breakwater is designed to allow for continued sediment flow over the inner leg of the breakwater).

By proposing to maintain the inner leg of the rehabilitated breakwater at a relatively low elevation (similar to the current elevation), the applicant has chosen the design alternative that involves the least amount of necessary maintenance dredging. This result is due to the fact that waves at high tide are currently able to wash over the breakwater and transport sediment in the westward direction. As the applicant is not proposing to increase the elevation of the breakwater near the beach (which would make the breakwater a blocking structure) waves will continue to be able to wash over the breakwater at higher tides post-rehabilitation. However, as the elevation of the outer leg of the breakwater will be increased under the proposed design, less sediment will be able to move out of the harbor in the southerly direction, as it can under the breakwater's existing deteriorated condition. Thus, the applicant estimates that a limited amount of maintenance dredging will be necessary, primarily to address occasional episodes of ocean conditions that create a fairly sudden accumulation of sand on the northeast side of the breakwater.

An alternative to dredging the estimated 2,000 cubic yards of material over a five year period for maintenance purposes would be to dredge a more expansive area of the harbor. This additional dredging potentially could increase the effectiveness of the area for boat launching. However, dredging a larger area than proposed would result in more disturbance to the marine environment, a greater potential for water quality impacts associated with dredging activities and equipment, and an increased potential for adverse impacts to marine organisms inhabiting the rocky intertidal area down from the dredged-material receiving environment. Furthermore, such increased dredging could affect the wave conditions in the vicinity of Wash Rock, according to the engineering study completed for the project (Exhibit No. 5).

Therefore, the Commission finds that the alternative of dredging a greater or lesser amount than as proposed is not a feasible less environmentally damaging alternative to the proposed project, as conditioned.

c. Alternative Disposal Sites

An alternative to depositing the dredged material at the proposed receiving site would be

to dispose of all the dredged material at an upland location outside of the coastal zone. However, depositing the dredged materials suitable for beach replenishment on area beaches roughly simulates the natural sand transport process. Furthermore, Section 30233(b) of the Coastal Act directs in part that "*dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.*"

Another alternative dredged material disposal site is along the beach to the northeast of the breakwater, towards Dead Man's Gulch. However, disposal of suitable dredged material in this area would not guarantee that the material would be transported around the outer edge of the breakwater into the current system moving towards Point Delgada. Instead, material could end up back in the protected area of the harbor, as the analysis of sediment transport completed by the applicant's consultant (Exhibit No. 5) shows that sand moves in a general northwesterly direction through Shelter Cove. Thus, placement of dredged sand spoils on the beach northeast of the breakwater could ultimately impact the efficiency of boat launching and retrieval operations (as the spoils would be redeposited by wave currents in the launch area) and increase the need for more frequent maintenance dredging.

Therefore, the Commission finds that the alternative of disposing of dredged accumulated sediment from the protected area at an upland location is <u>not</u> a feasible less environmentally damaging alternative to the proposed project, as conditioned.

<u>Conclusion</u>

For all of the reasons discussed above the Commission finds that there is no less environmentally damaging feasible alternative to the development as conditioned, as required by Section 30233(a).

3. Feasible Mitigation Measures

The third test set forth by Section 30233 is whether feasible mitigation measures have been provided to minimize adverse environmental impacts. The proposed development would be located within and around coastal waters and wetlands. Depending on the manner in which the proposed maintenance dredging is conducted, the significant adverse impacts of the project may include (1) effects on sensitive fish species; (2) water quality impacts; and (3) impacts to rocky intertidal habitat from the placement of dredged materials in the high tidal zone west of the breakwater. The potential impacts and their mitigation are discussed below in the following sections.

a. <u>Effects on Sensitive Fish Species</u>

The National Marine Fisheries Service (NOAA-Fisheries) completed an informal consultation for the project (File No. 2009/06655), which outlined the project's potential effects on marine species listed under the federal Endangered Species Act and "Essential Fish Habitat" (EFH) under the Magnuson-Stevens Fishery and Conservation Act. The consultation addressed potential impacts to threatened salmonids (Coho, Chinook, and

Steelhead), threatened Green Sturgeon, and EFH for salmon species (Chinook and Coho), coastal pelagic species (e.g., northern anchovy, Pacific sardine, etc.), and groundfish species (e.g., various rockfishes, flatfishes, sharks, etc.).

The NOAA-Fisheries informal consultation concludes that the project may affect, but is not likely to adversely affect, listed salmonids, Green Sturgeon, and EFH. Potential adverse effects to these species and EFH are associated, in part, with changes in sediment transport in the area behind the breakwater, the displacement of larger prey items that will disperse from the area during project activities, and increases in turbidity both during and after project activities. The consultation finds these effects to be discountable and insignificant in part because the work is proposed to be done from land during low tide, and listed species and EFH species will not be occupying the area during construction times.

To ensure that the proposed maintenance dredging activities are carried out in a manner that will not cause significant adverse impacts to sensitive fish species or habitat, as concluded by NOAA-Fisheries staff, the Commission attaches **Special Condition No. 1**. As described above, this condition requires that all maintenance dredging activities shall be conducted during the period of September 15 through May 15, in order to protect sensitive fish species. Furthermore, the condition requires that all dredging activities be conducted during periods of low-tides only, above the water surface to minimize suspended sediment and potential water quality impacts.

b. Water Quality Impacts

The proposed maintenance dredging could adversely affect water quality through increases in turbidity both during and after project activities and changes in sediment mobility and transport in the area. These effects will be temporary and short term in nature and are expected to quickly dissipate in the area following construction activities. As previously discussed, the Commission attaches various conditions to minimize significant adverse effects on water quality. These include the following: **Special Condition No. 1** in part limits the construction window for maintenance dredging to periods of low tide only, above the water surface, which will help minimize water quality impacts. **Special Condition No. 2** requires adherence to various construction protocols including, but not limited to, no construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wave, wind, or rain erosion and dispersion. **Special Condition No. 3** requires submittal of a final Sedimentation and Runoff Control Plan that addresses all phases of development and construction activities authorized under this coastal development permit (including maintenance dredging). **Special Condition No. 4** requires submittal of a final Hazardous Materials Management Plan to reduce impacts to water quality from the use and management of hazardous materials on the site (including, but not limited to, equipment fuels and contaminated sediments that could result from the proposed maintenance dredging activities).

c. Impacts to Rocky Intertidal Habitat from the Placement of Dredged Materials in the High Tidal Zone West of the Breakwater

As described above in Finding IV-C "Project Description," the applicant proposes to dispose of the dredged materials from the periodic maintenance dredging in the high tide zone on the west side of the breakwater, near the small "pocket beach." In response to concerns raised by the Department of Fish and Game and Commission staff about the suitability of dredged materials for deposition at the receiving site, the applicant prepared a Maintenance Dredging and Disposal Plan (Exhibit No. 6). The plan proposes sampling immediately prior to each maintenance dredging activity to ensure (1) that the grain size of the dredged materials is similar in size to the grain size at the receiving site, and (2) that the amount of total petroleum hydrocarbons (gasoline, diesel, and motor oil) within the dredged materials does not exceed certain specified maximum allowable limits.

The proposed plan provides a good start to protecting water quality and providing for sand that is suitable for beach replenishment to be returned to coastal waters. However, as the proposed receiving site is immediately upslope of rocky intertidal habitat, placement of dredged materials in this area could adversely impact marine organisms inhabiting this area, if the rocky intertidal habitat were to be smothered by the deposited dredged materials that as they are carried back into the water by the tides. Furthermore, it is unclear whether or not the standards proposed in the plan for determining sediment contamination adhere to the waste discharge standards imposed by the California Ocean Plan (administered by the State Water Resources Control Board), as the proposed receiving area is within the King Range Area of Special Biological Significance.

Therefore, the Commission attaches **Special Condition No. 6**. This condition requires that the applicant submit a revised maintenance dredging and disposal plan prior to permit issuance for the Executive Director's review and approval. The revised plan shall substantially conform to the plan included as Exhibit No. 6, except it shall demonstrate that (a) prior to each dredging event, dredged materials shall be tested for concentrations of contaminants as directed in the California Ocean Plan for the King Range ASBS; (b) if the dredged material samples are determined to contain contaminant concentrations above the limitations set by the State Water Resources Control Board or are determined to be unsuitable for beach replenishment based on the stated grain size compatibility standards, the dredged materials must be hauled off-site for disposal at an authorized upland disposal location; (c) dredged materials that are determined to be unsuitable for beach replenishment based on the stated grain size compatibility standards and above contaminant standards shall <u>not</u> be temporarily placed or stored on area beaches or where they may be subject to entering coastal waters; (d) dredging activities shall occur only during the period of September 15 through May 15 and during periods of low tides, consistent with Special Condition No. 1; and (e) the placement of suitable dredged materials at the proposed beach receiving site shall not adversely impact adjacent intertidal biological communities. The revised plan shall include, in part, a Biological Monitoring and Reporting Plan designed by a qualified marine biologist to assess and report any changes to species diversity and abundance in the adjacent intertidal biological communities resulting from the placement of suitable dredged materials at the proposed beach receiving site. If the results of the approved biological monitoring and reporting protocol indicate that the dredging disposal on the proposed receiving beach has adversely impacted the species diversity and/or abundance of adjacent intertidal

biological communities based on the goals and objectives set forth in the approved plan, the permittee shall submit a revised or supplemental Maintenance Dredging & Disposal Plan to either (1) relocate the dredged material receiving area to a suitable location that will not have significant adverse effects on species diversity, intertidal biological communities, or other coastal resources, or (2) provide for disposal at an authorized upland disposal site. The revised plan shall be processed as an amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

As explained above, Section 30233(b) directs that dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation, and dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems. As Special Condition No. 6 requires that (1) dredged material determined to be unsuitable for beach replenishment based on the grain size compatibility standards and/or contaminant concentration thresholds specified must be hauled off-site for disposal at an authorized upland disposal location, and (2) the placement of suitable dredged materials at the proposed beach receiving site shall not adversely impact adjacent intertidal biological communities, the Commission finds that the project, as conditioned, is consistent with Section 30233(b) of the Coastal Act.

Conclusion

The Commission finds that as conditioned, feasible mitigation measures have been provided to minimize adverse environmental effects consistent with Section 30233(a) of the Coastal Act.

4. Maintenance & Enhancement of Biological Productivity & Functional Capacity

The fourth general limitation set by Sections 30230, 30231, and 30233 is that any proposed dredging or filling in coastal wetlands must maintain and enhance the biological productivity and functional capacity of the habitat, where feasible.

As discussed above, the conditions of the permit will ensure that the project will not have significant adverse impacts on the water quality of any of the coastal waters in the project area and will ensure that the project construction will not adversely affect the biological productivity and functional capacity coastal waters or wetlands. Therefore, the Commission finds that the project, as conditioned, will maintain the biological productivity and functional capacity of the habitat consistent with the requirements of Sections 30230, 30231, and 30233 of the Coastal Act.

F. Protection of Public Access & Recreation

Coastal Act Sections 30210, 30211, and 30212 require the provision of maximum public access opportunities, with limited exceptions. Coastal Act Section 30210 requires, in applicable part, that maximum public access and recreational opportunities be provided

when consistent with public safety, private property rights, and natural resource protection. Section 30211 requires, in applicable part, that development not interfere with the public's right of access to the sea where acquired through use (i.e., potential prescriptive rights or rights of implied dedication). Section 30212 requires, in applicable part, that public access from the nearest public roadway to the shoreline and along the coast be provided in new development projects, except in certain instances, such as when adequate access exists nearby or when the provision of public access would be inconsistent with public safety. In applying Sections 30211 and 30212, the Commission is limited by the need to show that any denial of a permit application based on these sections or any decision to grant a permit subject to special conditions requiring public access is necessary to avoid or offset a project's adverse impact on existing or potential public access.

As discussed above in Finding IV-B "Environmental Setting," a relatively steep, paved road runs down the bluff to the cove, providing public access to the boat launch area and adjacent beaches. There is a small beach between the base of the bluff and the inward end of the breakwater, which serves as an informal parking area for a small number of vehicles to avoid high tide. This informal parking area is about 3,000 square feet in size and can accommodate approximately 10 vehicles with trailers (though fewer vehicles can be accommodated at higher tides). A beach extending eastward for approximately 0.5-mile or more along the north end of the cove from the boat launching area to Dead Man's Gulch is a popular public beach for beachcombing, sightseeing, surfing access (surfing is popular near Wash Rock, located about 180 feet northeast from the tip of the existing breakwater, and at Dead Man's Gulch), and other passive recreational uses. There is also a small "pocket beach" to the west of the boat launching area that is popular for tide-pooling and sightseeing.

The project proposes to complete repairs to the road, including repairs to the road surface, guard rail, and signage, and concrete launch area, in addition to rehabilitation of the breakwater and periodic maintenance dredging of the launch ramp area. Due to expected weather delays and the ability to work only at periods of low tides, the bulk of the construction is proposed to span the course of an approximately five-month period, although actual construction activities are expected to take closer to just two months. Equipment staging and stockpiling is proposed to be located at "lot MMM" near the airstrip, though during active construction at low tides, equipment and materials will occupy the bulk of the beach parking area near the launch ramp. At high tides, the majority of construction equipment and materials will be staged at lot MMM.

Vehicular access to the boat launch ramp and the adjacent parking area is proposed to be closed during the duration of the construction period for public safety purposes and to minimize interference with construction equipment and materials moving back and forth through the area between tides. This closure will interfere with the public's ability to launch boats from the area for up to five months, which is the anticipated construction duration. Although the project will impact boating access and vehicular access at Shelter Cove, these impacts will be short-term and minimized with the inclusion of **Special Condition No. 1**. As previously explained, this condition limits the timing of

construction to the period of September 15 through May 15, in order to minimize conflicts with the peak commercial and recreational fishing season.

According to information from the applicant, it is feasible to maintain some pedestrian use of the cove beaches during the construction period. Popular pedestrian uses of the area, as described previously, include beachcombing, sightseeing, surfing access, and other passive recreational uses.

Thus, the Commission attaches **Special Condition No. 7** to require that the applicant submit a public access plan for the Executive Director's review and approval prior to permit issuance. The Public Access Plan shall demonstrate that reasonable use of the beach access road and cove beaches shall be maintained for pedestrians for the duration of the construction period, except for those areas under active construction and those areas used for the staging and transport of active construction equipment working on the authorized development.

Therefore, as the interference with public access and recreational use of the site will be limited to a relatively short duration and during non-peak periods of use, and as pedestrian access will be maintained to the site for the duration of the project, the Commission finds that the project, as conditioned, will not have a significant adverse effect on public access, and that the project as proposed without new public access is consistent with the requirements of Coastal Act Sections 30210, 30211, and 30212.

G. Protection of Commercial Fishing & Recreational Boating Facilities

1. Applicable Coastal Act Policies and Standards

Section 30224 of the Coastal Act states the following (emphasis added):

> *Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.*

Section 30234 of the Coastal Act states, in applicable part, the following:

> *Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded…*

2. Consistency Analysis

As discussed above in Finding IV-A, the Shelter Cove Boat Launching Facility, which has been managed by the applicant since the late 1970s, includes a beach access road, boat launch ramp, turnaround area, utilities, and the breakwater itself. Prior to the Harbor District involvement, the beach launch area had been used by local commercial and sport fishermen. A low-rock breakwater was originally constructed in the early 1970s along the alignment of a naturally occurring rocky offshore reef. The Commission issued at least four permits or permit amendments in the late 1970s and throughout the 1980s for

repair and maintenance of the Shelter Cove Boat Launching Facility, including repairs to the breakwater, beach access road, and boat launch ramp area, and authorization of bluff stabilization (rock slope protection) at the base of the bluff behind the beach adjacent to the breakwater.

Shelter Cove has long been used as a launch site for commercial and recreational fishermen, and Shelter Cove harbor provides the only harbor of refuge from the common northwesterly winds and seas between Noyo Harbor at Fort Bragg and Humboldt Bay at Eureka, as discussed above. The breakwater's effectiveness at protecting the popular boat launch facility has been reduced over time due to the settling of rocks and loss (due to wave action) of smaller rocks used in the original breakwater construction. As a result, the breakwater currently is under water at high tides, and boat launching is unstable at times. At public meetings held by the Harbor District, improving the breakwater to increase public safety and boating access has been the expressed overriding interest.

The applicant has proposed construction activities to occur between September 15 and May 15 to minimize conflicts with boating access. Fishing is most common during late spring through mid-fall when the cove is protected from the common northwest winds and waves and the best conditions for launching and offshore moorage occur. Although the project will impact boating access by interfering with the public's ability to launch boats at Shelter Cove during the construction period, the Commission finds that this impact is short-term and temporary, and the rehabilitation of the breakwater will improve boating access and safety over the long-term. As previously discussed, the Commission attaches **Special Condition No. 1** to ensure that the timing of construction does not significantly impact boating use of the area by restricting the construction window to the late fall, winter, and early spring months. Furthermore, **Special Condition No. 2(M)** requires that at the end of the construction period, the permittee shall inspect the project area and ensure, in part, that the project has not created any hazard to navigation.

Therefore, the Commission finds that the project as conditioned will protect and improve the existing boat launching facility that serves commercial fisheries and recreational boating, consistent with Coastal Act Sections 30224 and 30234.

H. Protection of Visual Resources

1. Applicable Coastal Act Policies and Standards:

Section 30251 of the Coastal Act states, in applicable part, the following:

> *The scenic and visual qua1ities 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 qua1ity in visually degraded areas. New development in highly scenic areas…shall be subordinate to the character of its setting.*

2. Consistency Analysis:

The project area is not located within a highly scenic area. Additionally, the project will not result in the alteration of natural landforms and will require only a minimal amount of grading. Moreover, none of the proposed development, including the proposed breakwater crest elevations of 4.5 feet to 9.5 feet (NGVD29), will block public views of the ocean.

To allow a reasonable execution and completion of the project, the project does propose to conduct at least some of the work during night-time low tides, which will require the use of portable high-intensity lighting. Exterior lighting can impact visual resources by creating excessive glare (e.g., which would be out of character with an otherwise rural setting) and impact biological resources by disturbing nocturnal wildlife (e.g., many species avoid areas with excessive lighting, and some species simply stop reproducing if habitat destruction from overly bright lights becomes too severe). The applicant has not provided any details as to the types or standards of lighting to be used for the nighttime construction work. In the Environmental Impact Report prepared for the project, one of mitigation measures requires that all new sources of exterior nighttime lighting be designed to avoid adverse impacts on navigation and to protect nighttime views, including the night sky, to the extent practicable.

To ensure that the effects of project's proposed lighting are minimized, the Commission attaches **Special Condition No. 8**. This condition requires that all exterior lights used during nighttime construction activities and/or installed in the project area shall be the minimum wattage necessary for accomplishing nighttime construction work, non-reflective, shielded, and have a directional cast downward such that no light will shine beyond the boundaries of the construction area or significantly into the cove or surrounding beaches.

Therefore, the Commission finds that as conditioned, the proposed project is consistent with the visual resource policies of Section 30251 of the Coastal Act, as the project is compatible with the visual character of the surrounding area and will not block views to and along the coast.

I. Geologic Hazards & Shoreline Structures

1. Applicable Coastal Act Policies and Standards:

Section 30253 of the Coastal Act states, in applicable part, the following:

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

2. Consistency Analysis:

As described above in Finding IV-B "Environmental Setting," Shelter Cove is a hook-shaped bay, with Point Delgada as the upcoast (western) limit and rocky outcroppings near Dead Man's Gulch approximately one-half mile to the southeast as the downcoast (eastern limit). The cove faces south, and its location, sheltered by Point Delgada, makes it an important refuge from the predominantly northwesterly winds and seas in the area. During westerly and southerly storms, however, waves diffract around Point Delgada and move unimpeded into the cove, making beach access precarious.

The applicant completed a coastal engineering study for the project (Exhibit No. 5) to determine, in part, the following: (1) the effect of the breakwater rehabilitation on launch operations; (2) the effect of the breakwater rehabilitation on surf conditions at Wash Rock; (3) a conceptual analysis of long-shore and cross-shore sediment transport processes and identification of potential sedimentation and erosion areas; and (4) the impact of the project on beach and bluff erosion at Point Delgada. The study included numerical simulations for the range of incident wave conditions (height and period) that the breakwater is exposed to and an assessment of wave transformation parameters at key locations that represent the effects of the breakwater.

The coastal engineering analyses conclude, in part, that the breakwater rehabilitation, as proposed, will result in a reduction in wave energy at high tide in the lee of the breakwater, which will benefit launching and retrieval of boats. The study does not anticipate any improvement in breakwater performance at low tides, as the existing breakwater already effectively protects the harbor at low tides. Furthermore, the study believes that the proposed project will not affect wave conditions at Wash Rock or in the area between Point Delgada and the breakwater. Therefore, no adverse effects are expected to surfing resources or to the beach and bluff west of the breakwater, respectively. Similarly, no changes are anticipated to the beaches east of the launch ramp, because the study concludes that the proposed project will have no effect on littoral transport processes in that area.

Special Condition No. 9 requires the applicant to assume the risks of extraordinary erosion and flood hazards of the breakwater area and waive any claim of liability on the part of the Commission. Given that the applicant has chosen to implement the project despite these risks, the applicant must assume the risks. In this way, the applicant is notified that the Commission is not liable for damage as a result of approving the permit for the development. The condition also requires the applicant to indemnify the Commission in the event that third parties bring an action against the Commission as a result of the failure of the development to withstand hazards.

Therefore, the Commission finds that as conditioned, the project will minimize risks to life and property from geologic and flood hazards, will assure stability and structural integrity, and will neither create nor contribute significantly to erosion, geologic instability, or erosion of the site or surrounding area consistent with the requirements of Section 30253 of the Coastal Act.

J. Public Trust Lands

The project area for the proposed breakwater rehabilitation and maintenance dredging and disposal work (tidelands and submerged lands) is located in an area subject to the public trust. On June 1, 2009, the State Lands Commission (SLC) authorized a 25-year General Lease – Public Agency Use, PRC 1956.9, with the applicant for "continued use and maintenance of a small craft public launching facility and designated anchorage area, maintenance dredging a maximum of 10,000 cubic yards of material during the Lease term, the rehabilitation of an existing breakwater, and temporary placement of warning buoys…". The lease will expire on May 31, 2034. Therefore, no additional approval from SLC is necessary for the proposed development.

K. North Coast Regional Water Quality Control Board Approval

The project falls under the regulatory authority of the North Coast Regional Water Quality Control Board pursuant to Section 401 of the Clean Water Act (33 USC 1341) and/or the Porter-Cologne Water Quality Control Act. The Regional Board posted a 21-day public notice for Water Quality Certification and/or Waste Discharge Requirements (WDID No. 1B07027WNHU) for the project on July 2, 2009.

To ensure that the project ultimately approved by the Regional Board is the same as the project authorized herein, the Commission attaches **Special Condition No. 10**, which requires the applicant to submit to the Executive Director evidence of the Regional Board's approval of the project prior to permit issuance. The condition requires that any project changes resulting from this other agency approval not be incorporated into the project until the applicant obtains any necessary amendments to this coastal development permit.

L. State Water Resources Control Board Approval

Because Shelter Cove lies within the King Range Area of Special Biological Significance, the project falls under the regulatory authority of the State Water Resources Control Board pursuant to California Ocean Plan. The project requires an exception to the Ocean Plan.

To ensure that the project ultimately approved by the State Board is the same as the project authorized herein, the Commission attaches **Special Condition No. 11**, which requires the applicant to submit to the Executive Director evidence of the State Board's approval of the project prior to permit issuance. The condition requires that any project changes resulting from this other agency approval not be incorporated into the project until the applicant obtains any necessary amendments to this coastal development permit.

M. U.S. Army Corps of Engineers Approval

The project requires review and authorization by the U.S. Army Corps of Engineers. Pursuant to the Federal Coastal Zone Management Act, any permit issued by a federal agency for activities that affect the coastal zone must be consistent with the coastal zone management program for that state. Under agreements between the Coastal Commission

and the U.S. Army Corps of Engineers, the Corps will not issue a permit until the Coastal Commission approves a federal consistency certification for the project or approves a permit.

To ensure that the project ultimately approved by the Corps is the same as the project authorized herein, the Commission attaches **Special Condition No. 12**, which requires the applicant to submit to the Executive Director evidence of the Corps' approval of the project prior to commencement of construction. The condition requires that any project changes resulting from this other agency approval not be incorporated into the project until the applicant obtains any necessary amendments to this coastal development permit.

N. California Environmental Quality Act

The Humboldt Bay Harbor, Recreation, and Conservation District served as the lead agency for the project for CEQA purposes. The District completed a final Environmental Impact Report for the project in October of 2006 (SCH No. 2005042024).

Section 13906 of the California Code of Regulation requires Coastal Commission approval of a coastal development permit application to be supported by findings showing that the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Public Resources Code Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available, which would significantly lessen any significant effect that the activity may have on the environment.

The Commission incorporates its findings on conformity with Coastal Act policies at this point as if set forth in full. These findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As discussed herein in the findings addressing the consistency of the proposed project with the Coastal Act, the proposed project has been conditioned in order to be found consistent with the policies of the Coastal Act. As specifically discussed in these above findings which are hereby incorporated by reference, mitigation measures which will minimize all adverse environmental impact have been required. These required mitigation measures include requirements that limit extraction to avoid environmentally sensitive habitat areas, rare and endangered species, migratory fish, and extractions that could lead to changes in river morphology. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity would have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act and to conform to CEQA.

V. EXHIBITS

1. Regional Location Map
2. Vicinity Topographic Map
3. Aerial Photos Showing Site Features
4. Project Plans
5. Coastal Engineering Analyses
6. Maintenance Dredging and Disposal Plan (draft)

APPENDIX A

STANDARD CONDITIONS

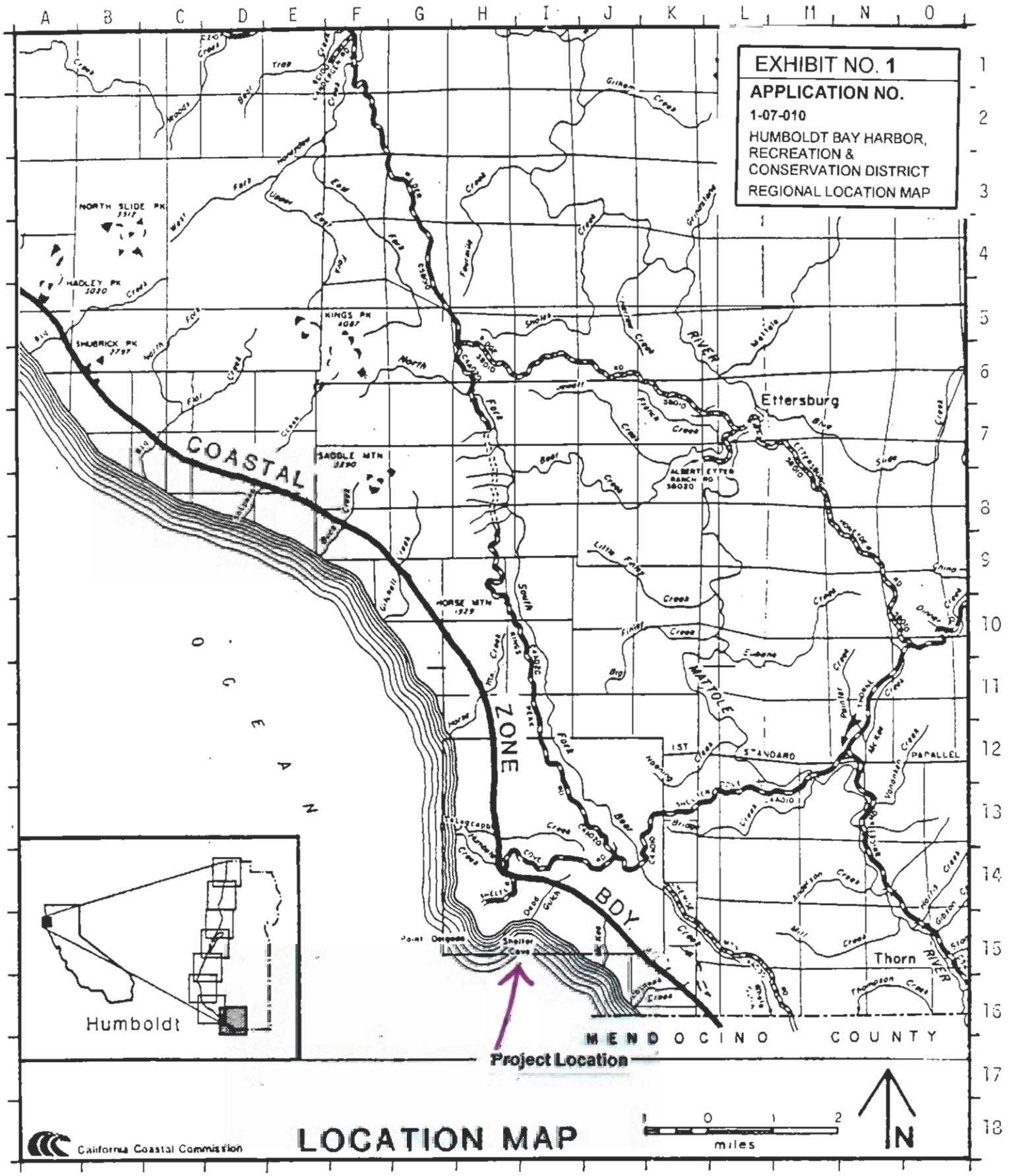
1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

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

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

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

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



County of Humboldt

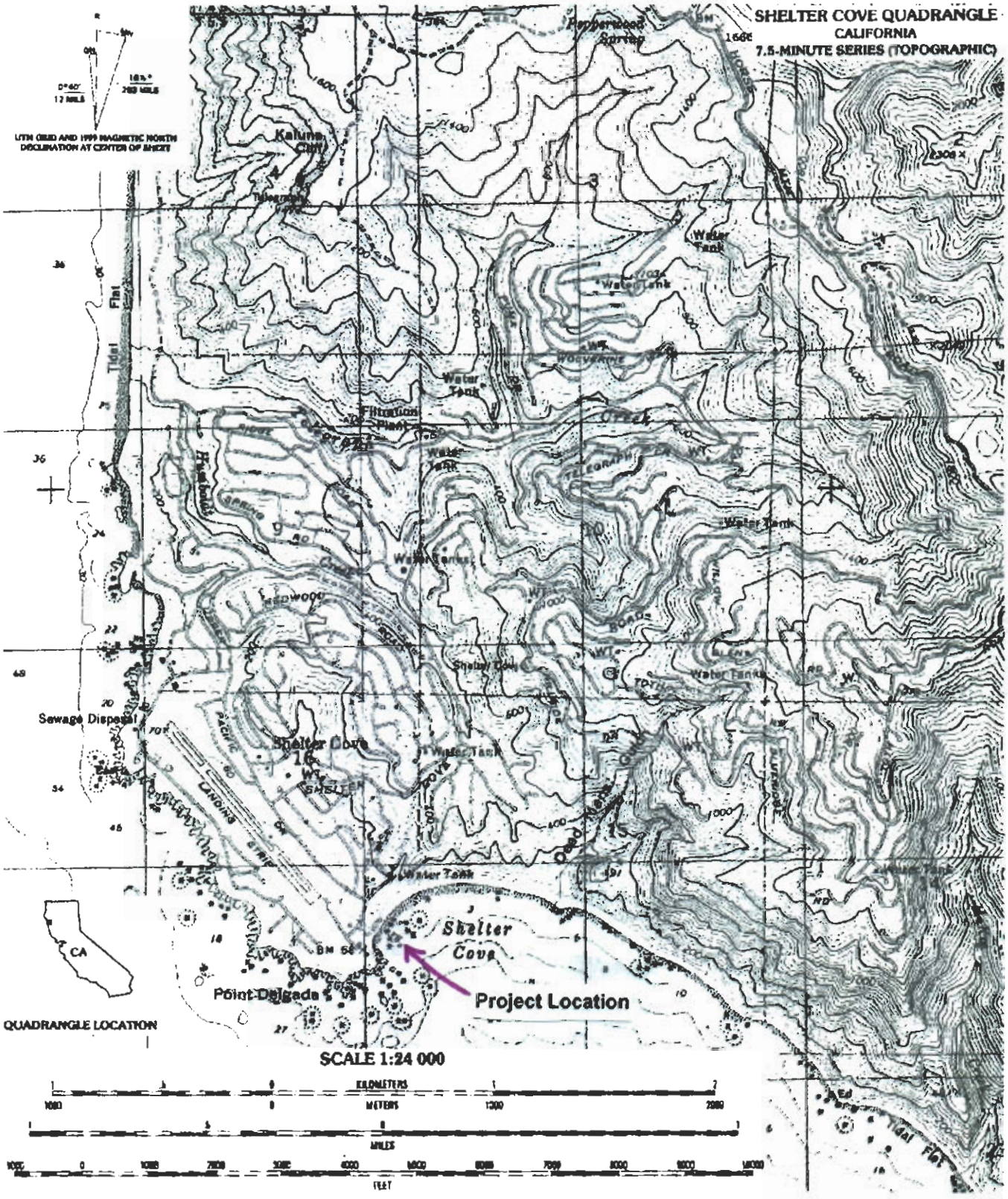


EXHIBIT NO. 2

APPLICATION NO.

1-07-010

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT

VICINITY TOPOGRAPHIC MAP

EXHIBIT NO. 3

APPLICATION NO.

1-07-010

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT

AERIAL PHOTOS (1 of 2)

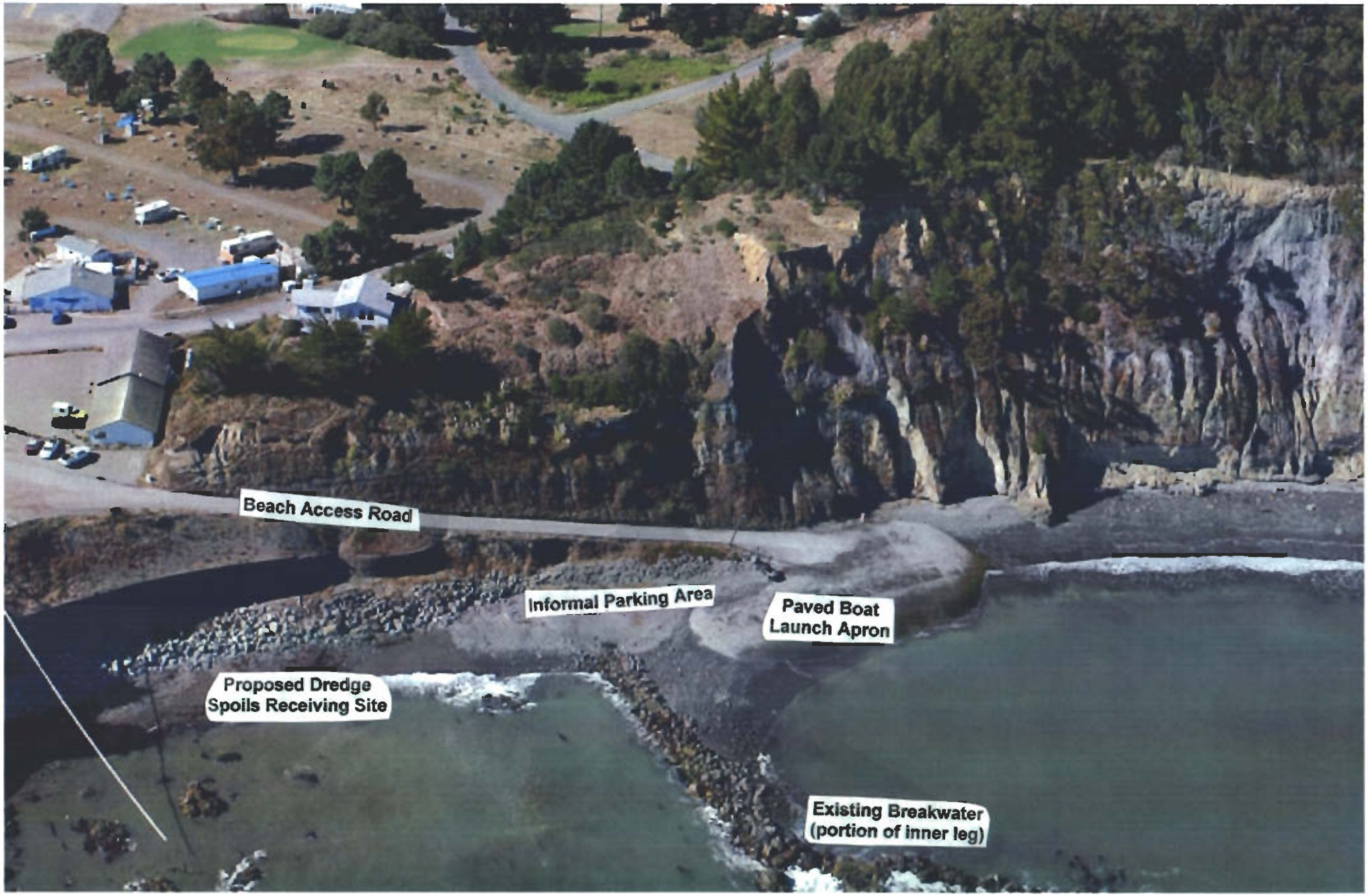

Beach Access Road
Informal Parking Area
Paved Boat Launch Apron
Proposed Dredge Spoils Receiving Site
Existing Breakwater (portion of inner leg)

EXHIBIT NO. 4

APPLICATION NO.

1-07-010

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT

PROJECT PLANS (1 of 6)

HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT
SHELTER COVE
BREAKWATER REHABILITATION PROJECT

SHELTER COVE, CALIFORNIA

INDEX OF DRAWINGS		
SHEET NUMBER	DRAWING NUMBER	TITLE
1	G1	TITLE SHEET
2	C1	SITE PLAN
3	C2	ACCESS ROAD & LAUNCH RAMP IMPROVEMENTS
4	C3	BREAKWATER IMPROVEMENTS
5	C4	BREAKWATER IMPROVEMENTS / SECTIONS

GENERAL NOTES

1. PROJECT VERTICAL CONTROL IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29).
2. TIDAL DATA FOR SHELTER COVE IS BASED ON THE ARENA COVE REFERENCE STATION (STATION ID 9416841, LATITUDE 38°54.8'N, LONGITUDE 123°42.5'W) AND PUBLISHED CORRECTIONS:

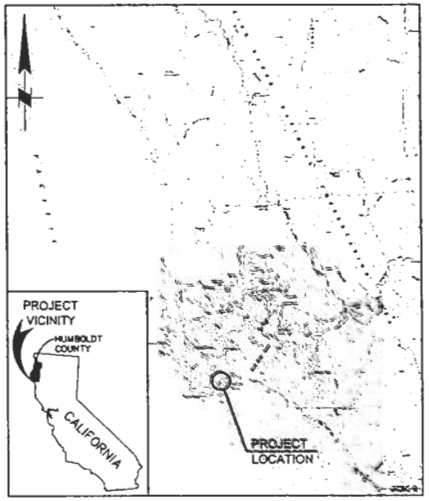
TIDE LEVEL	ELEVATION (FT. NGVD29)
HIGHEST OBSERVED WATER LEVEL (12/03/1983)	5.7
MEAN HIGHER HIGH WATER (MHHW)	2.8
MEAN HIGH WATER (MHW)	2.1
NATIONAL GEODETIC VERTICAL DATUM (NGVD)	0.0
MEAN TIDE LEVEL (MTL)	0.0
MEAN LOW WATER (MLW)	−2.1
MEAN LOWER LOW WATER (MLLW)	−3.3
LOWEST OBSERVED WATER LEVEL (01/19/1988)	−5.9

3. BASE MAP AND HYDROGRAPHIC SURVEY PROVIDED BY OSCAR LARSON & ASSOCIATES ON APRIL 26–27, 2004. HORIZONTAL DATUM IS NORTH AMERICAN DATUM 1983 (NAD83), CALIFORNIA STATE PLANE COORDINATES ZONE 1, BASED ON GPS TIES TO THE CAPE MENDOCINO CONTINUOUSLY OPERATING REFERENCE STATION, NGS PID "AF9558", CORS ID "CME1", EPOCH DATE 2002.00.

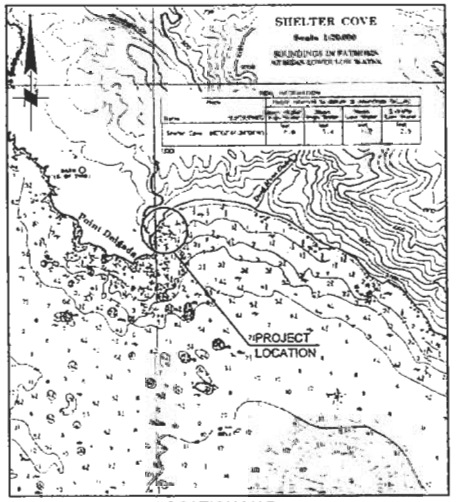
   ELEVATIONS ARE NGVD29 BASED ON "BENCHMARK NO. 1", STAMPED ELEVATION 55.15 SET BY KELLY–O'HERN ASSOCIATES IN 1990 AS SHOWN ON "TOPOGRAPHIC AND BOUNDARY SURVEYS FOR HUMBOLDT COUNTY OF PORTIONS OF THE AIRPORT AREA AT SHELTER COVE, CALIFORNIA" DATED NOVEMBER 1990. KELLY–O'HERN ELEVATIONS WERE BASED ON AN ELEVATION OF 62.50' ON STREET MONUMENT NO. 53 AS SHOWN ON MAPS "PREPARED BY ENGINEERS FOR THE SHELTER COVE RESORT IMPROVEMENT DISTRICT SHORTLY AFTER DEVELOPMENT OF THE SHELTER COVE SUBDIVISION." SHELTER COVE SUBDIVISION ELEVATIONS ARE BASED ON A TIE IN 1965 TO USGS BENCHMARK "S–275" NGVD29 ELEVATION 738.07' WHICH WAS SUBSEQUENTLY DESTROYED (PER RECOVERY NOTE FROM 1969).

SURVEY CONTROL POINTS				
POINT	NORTHING	EASTING	ELEV	DESCRIPTION
#3	1898580.12	5982741.45	62.16'	1" IRON PIPE W/ PLASTIC CAP AT OVERLOOK
#2	1899015.79	5893047.20	12.47'	1/2" REBAR W/ PLASTIC CAP ON ROCKY KNOB

SEE SHEET C1 FOR LOCATION OF SURVEY CONTROL POINTS.



VICINITY MAP
SCALE: 1" = 4500' APPROX

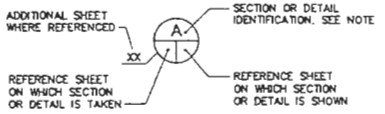


LOCATION MAP
SCALE: 1" = 1400' APPROX

ABBREVIATIONS

AC	ASPHALT CONCRETE
APPROX	APPROXIMATE
℄	CENTERLINE
CONC	CONCRETE
(E)	EXISTING
FT	FEET
LT	LEFT
MAX	MAXIMUM
MIN	MINIMUM
MLLW	MEAN LOWER LOW WATER
(N)	NEW
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
PCC	PORTLAND CEMENT CONCRETE
PSI	POUND PER SQUARE INCH
RT	RIGHT
SIM	SIMILAR
STA	STATION
TYP	TYPICAL
WP	WORK POINT

CROSS-REFERENCE LEGEND



NOTE: LETTER INDICATES SECTION, NUMBER INDICATES DETAIL. WHERE THERE IS NO REFERENCE SHEET INDICATED, IT MEANS THE DETAIL OR SECTION IS TAKEN AND SHOWN ON THE SAME SHEET.

60% DESIGN - NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	BY	DATE

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944–5411

DSGN	BP	DR	NN	CHK	DT
JOB NO.	5306–02	SUBMITTED BY		TITLE	

SHELTER COVE BREAKWATER REHABILITATION PROJECT

TITLE SHEET

DATE 10/17/08

SHEET 1 OF 5

G1

PLAN
SCALE: 1" = 30'

60% DESIGN - NOT FOR CONSTRUCTION

30 0 30 60
SCALE: 1" = 30'

REVISION	DESCRIPTION	BY	DATE

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

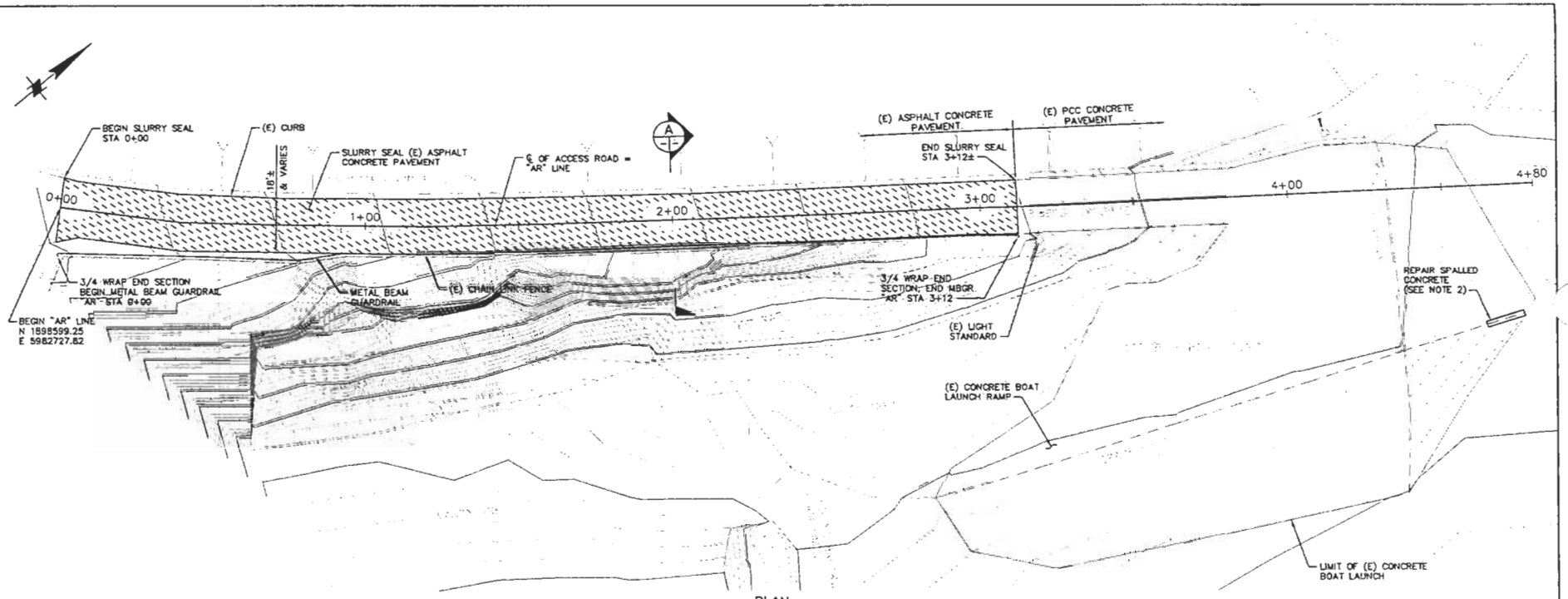
DSN	DR	CHK
BP	NN	DT
JOB NO. 5308-02	SUBMITTED BY	TITLE

SHELTER COVE
BREAKWATER REHABILITATION PROJECT

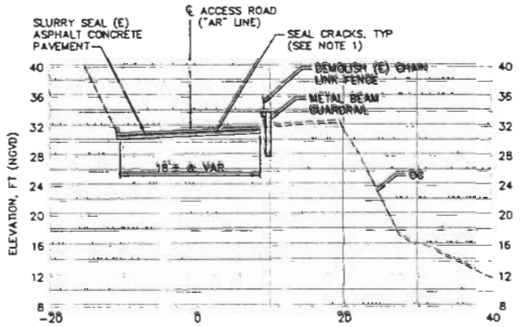
DATE 10/17/08
SHEET 2 OF 5

SITE PLAN

C1



PLAN
SCALE: 1" = 16'



SECTION A
SCALE: 1" = 8'

NOTES

1. CRACKS IN ASPHALT CONCRETE PAVEMENT GREATER THAN 1/16 INCH WIDE SHALL BE BLAST CLEANED AND SEALED PRIOR TO SLURRY SEAL. CLEANING AND SEALING SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. SPALLED AREAS IN CONCRETE PAVEMENT GREATER THAN 1/2 INCH WIDE SHALL BE BLAST CLEANED AND REPAIRED WITH HYDRAULIC GROUT AS SPECIFIED.

60% DESIGN - NOT FOR CONSTRUCTION

16 0 16 32
SCALE: 1" = 16'

REVISION	DESCRIPTION	BY	DATE

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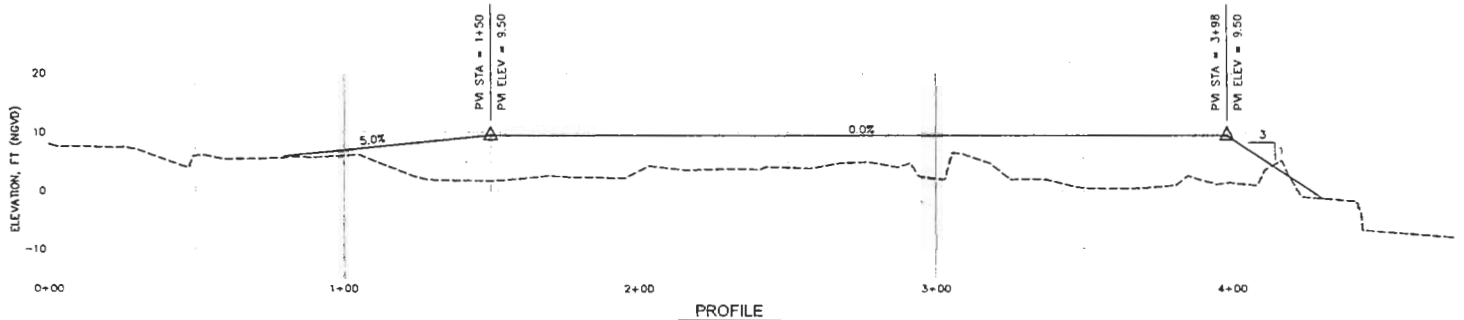
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

DSGN	DR	CHK
BP	NN	DT
JOB NO. 5308-02	SUBMITTED BY	TITLE

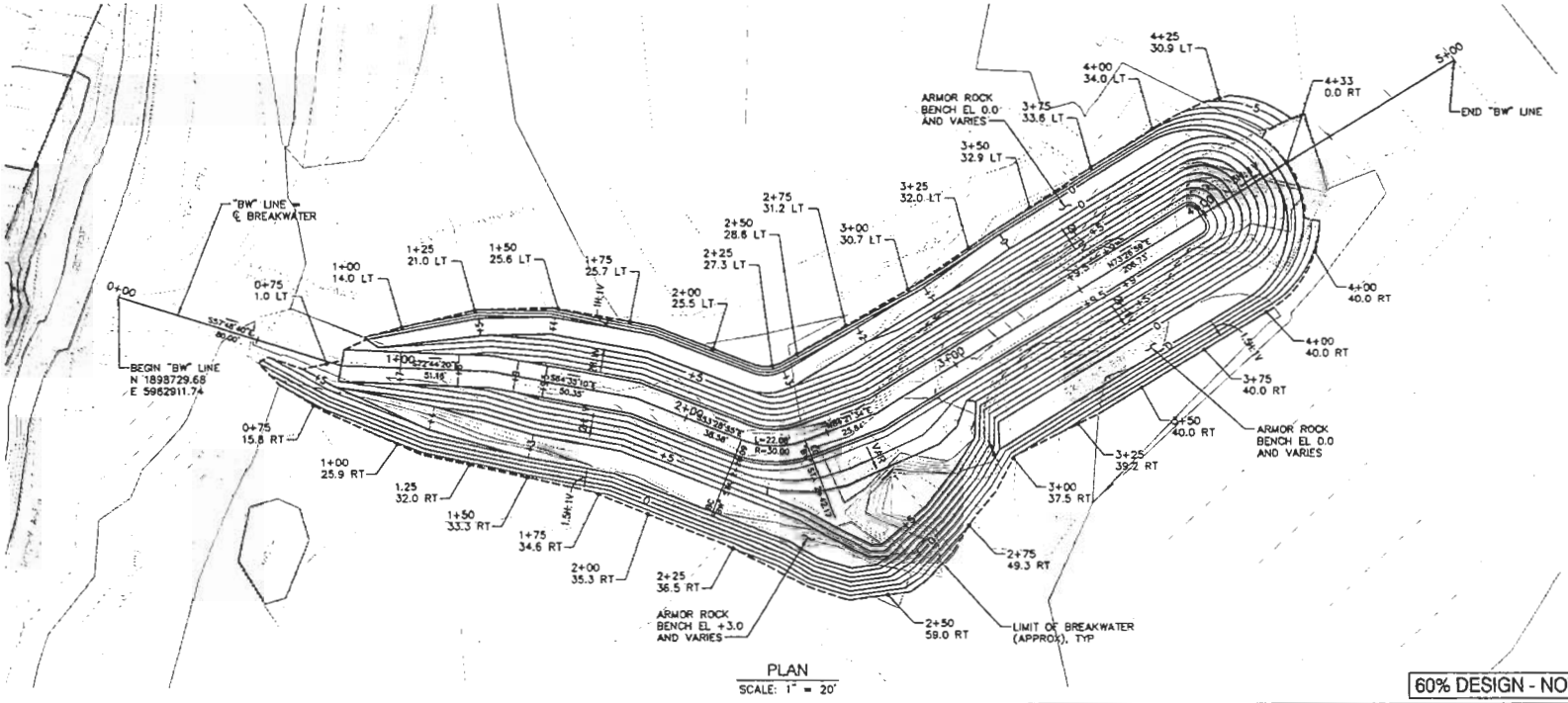
SHELTER COVE
BREAKWATER REHABILITATION PROJECT

ACCESS ROAD AND LAUNCH RAMP IMPROVEMENTS

DATE 10/17/08
SHEET 3 OF 5
C2



PROFILE
SCALE: 1" = 20' HORIZONTAL
1" = 10' VERTICAL



PLAN
SCALE: 1" = 20'

60% DESIGN - NOT FOR CONSTRUCTION

20 0 20 40
SCALE: 1" = 20'

REVISION	DESCRIPTION	BY	DATE

Moffatt & Nichol
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Walnut Creek, California 94596
(925) 944-5411

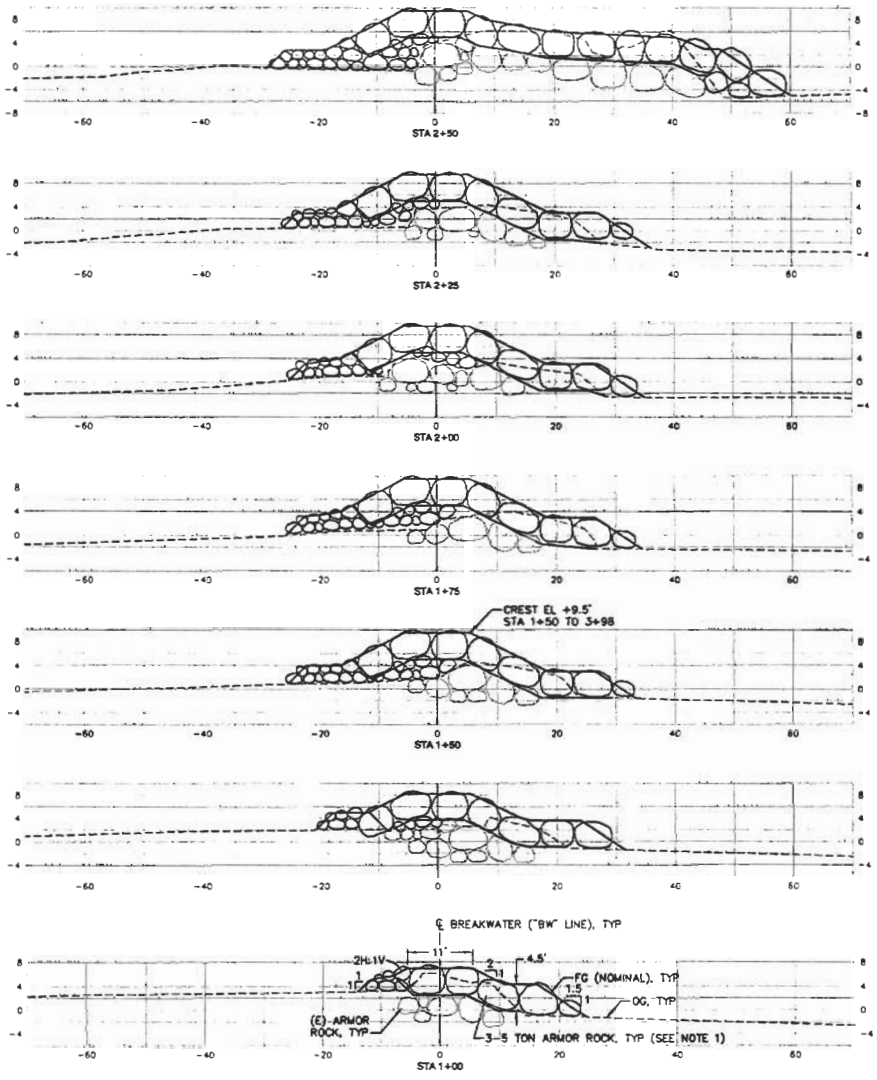
DSGN	DR	CHK
BP	NN	DT
JOB NO. 5308-02	SUBMITTED BY	TITLE

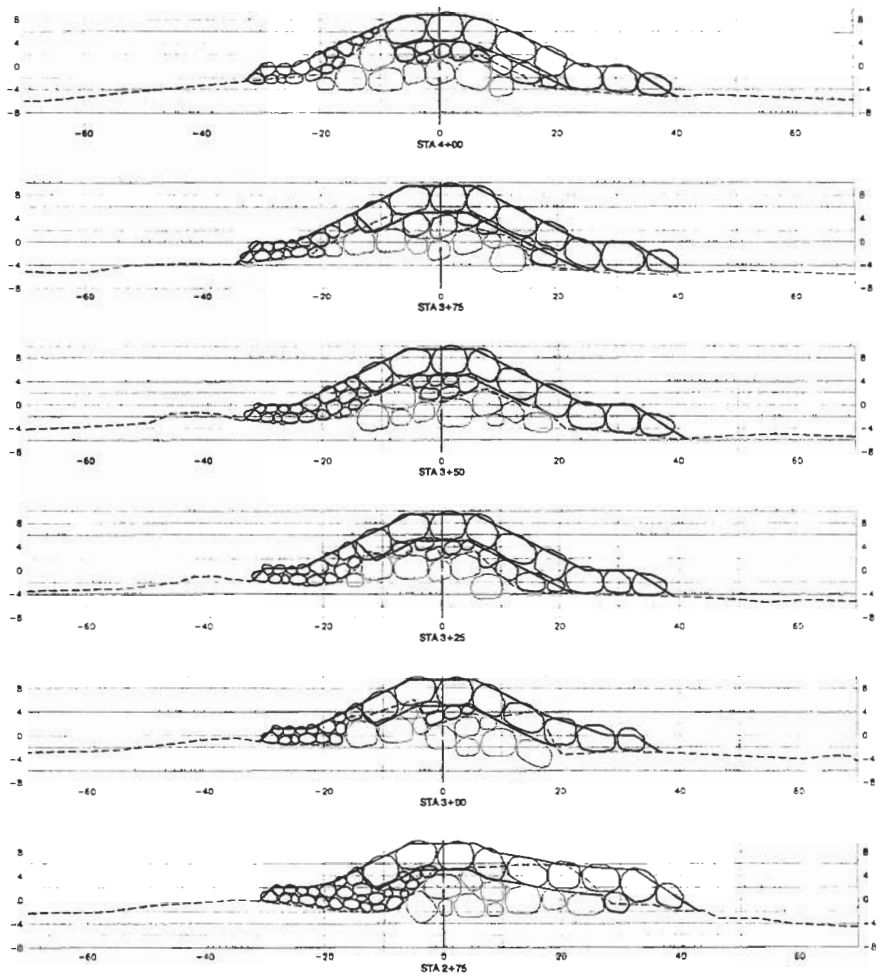
SHELTER COVE
BREAKWATER REHABILITATION PROJECT

DATE 10/17/08
SHEET 4 OF 5

BREAKWATER IMPROVEMENTS

C3





SECTIONS
SCALE: 1" = 10'

60% DESIGN - NOT FOR CONSTRUCTION

NOTES:

1. EXISTING ARMOR ROCK MEETING THE SIZE AND GRADATION REQUIREMENTS MAY BE REUSED WITHIN THE BREAKWATER.

SCALE: 1" = 10'

REVISION	DESCRIPTION	BY	DATE

Moffatt & Nichol
2001 N. Main Street, Suite 360
Walnut Creek, California 94596
(925) 944-5411

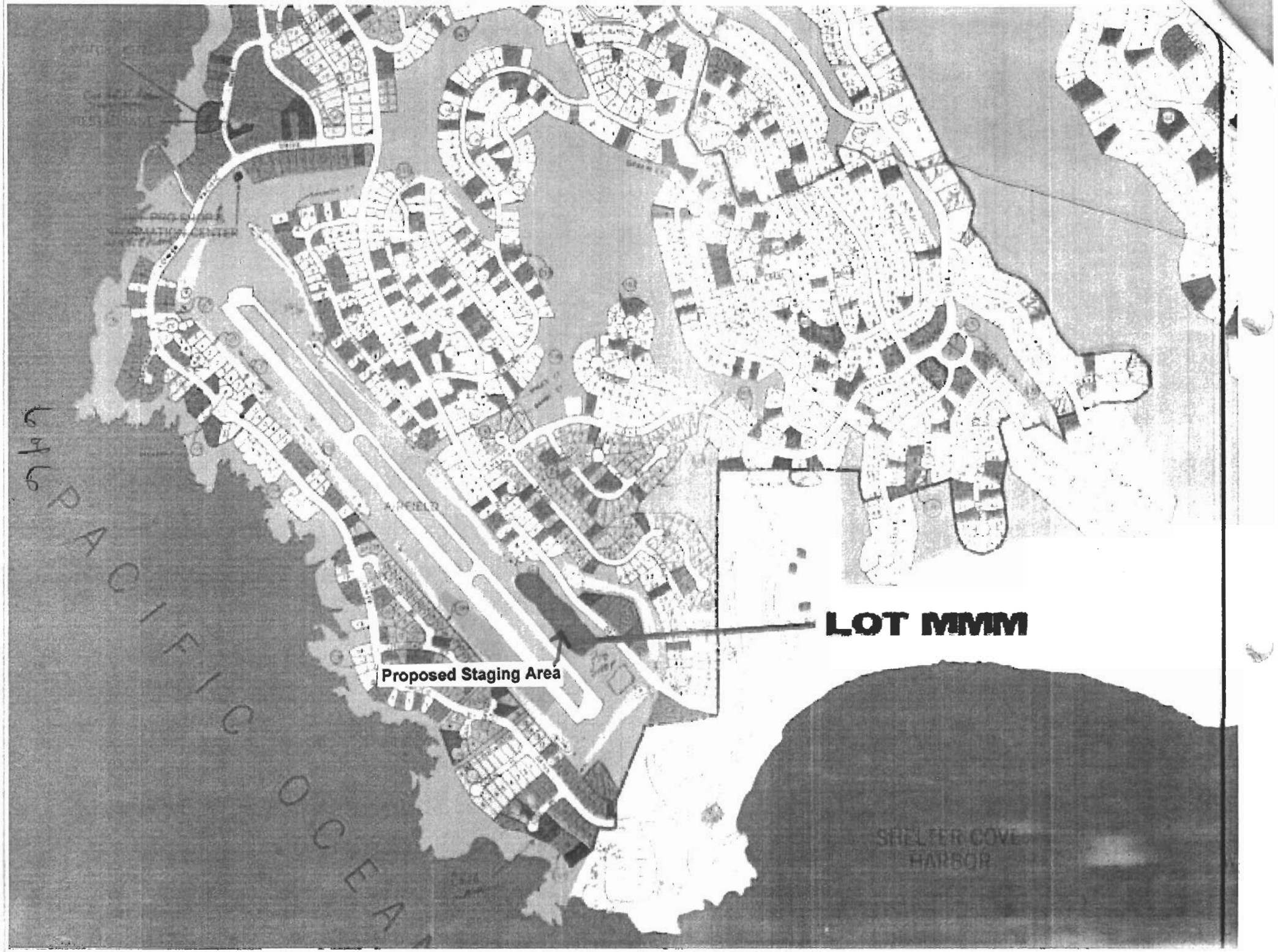
DSGN	DR	CHK
BP	NN	DT
JOB NO. 5308-02	SUBMITTED BY	TITLE

SHELTER COVE
BREAKWATER REHABILITATION PROJECT

DATE 10/17/08
SHEET 5 OF 5

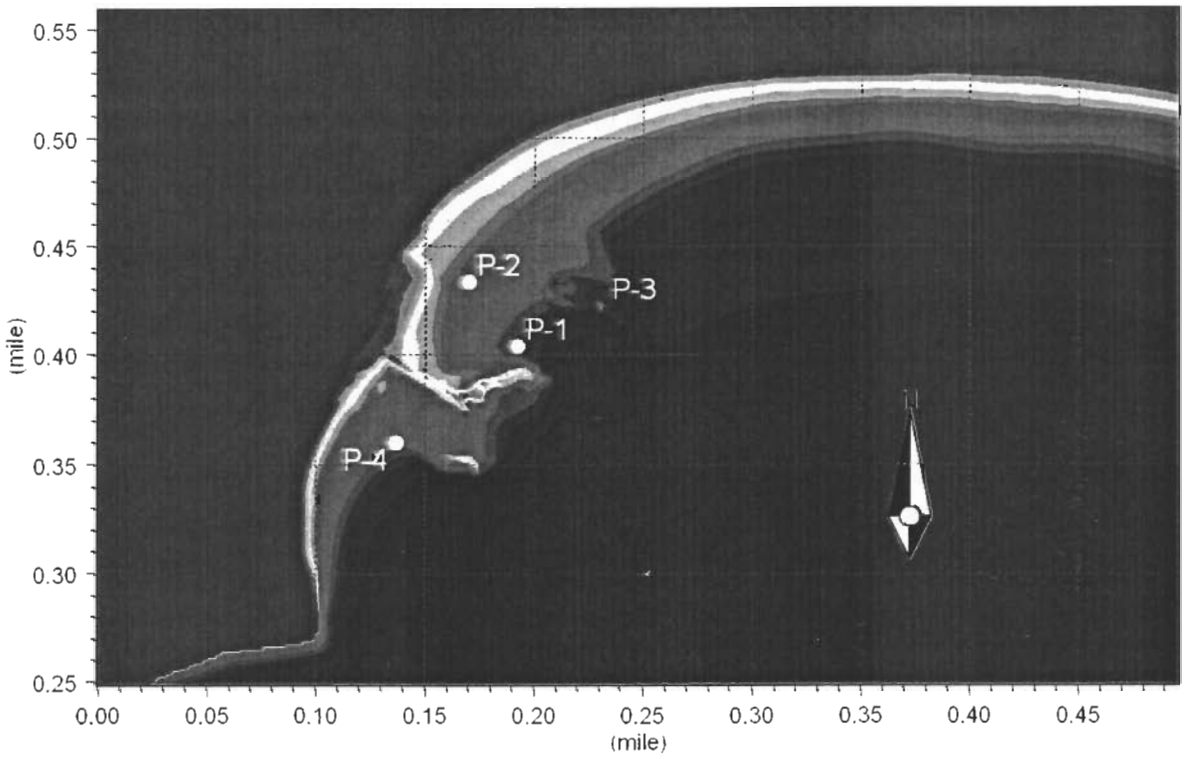
BREAKWATER IMPROVEMENTS
SECTIONS

C4


LOT MMM
Proposed Staging Area
PACIFIC OCEAN
SHELTER COVE
HARBOR

Shelter Cove
Breakwater Rehabilitation Project

COASTAL ENGINEERING ANALYSES



Prepared for:
Humboldt Bay Harbor, Recreation and Conservation District

Prepared By:

MOFFATT & NICHOL
2001 North Main Street, Ste 360
Walnut Creek, CA 94596

February 2006
M&N Job No: 5308-01

EXHIBIT NO. **5**
APPLICATION NO.
1-07-010 - HUMBOLDT BAY HARBOR, RECREATION & CONSERVATION DISTRICT
COASTAL ENGINEERING ANALYSES (EXCERPT)
(1 of 29)

MOFFATT & NICHOL

CONTENTS

1. INTRODUCTION 1
   - 1.1 BACKGROUND 1
   - 1.2 SCOPE OF WORK 2
2. BREAKWATER REHABILITATION INFLUENCES 3
   - 2.1 ANALYSIS APPROACH 3
   - 2.2 OFFSHORE WAVE CONDITIONS 3
   - 2.3 NUMERICAL SIMULATION OF OFFSHORE WAVE TRANSFORMATION 6
   - 2.4 NUMERICAL SIMULATION OF NEARSHORE WAVE TRANSFORMATION 11
   - 2.5 IMPROVEMENTS TO LAUNCH OPERATIONS 18
   - 2.6 EFFECT ON SURF CONDITIONS NEAR WASH ROCK 20
   - 2.7 EFFECT ON BEACH AND BLUFF EROSION 22
3. MAINTENANCE & CONSTRUCTION ISSUES 27
   - 3.1 OPERATION & MAINTENANCE ISSUES 27
   - 3.2 CONSTRUCTION ISSUES 28
4. SUMMARY 29
5. REFERENCES 31

TABLES

Table 2.2.1: Average Monthly Wave Height and Period at Cape Mendocino Buoy 4

Table 2.3.1: Wave Transformation From Deepwater to 30-ft Depth Contour 7

Table 2.5.1: Wave Transmission Into Harbor at MLW (P-1) and at MHW (P-2) 19

Table 2.6.1: Wave Transformation Near Wash Rock (P-3), at MLW 20

Table 2.6.2: Wave Transformation Near Wash Rock (P-3), at MHW 21

Table 2.7.1: Wave Height and Direction in 30 ft Water Depth ½ Mile South of the Breakwater (from wave rose at the buoy and offshore wave simulations) 23

Table 2.7.2: Wave Direction Distribution near the Breakwater Tip 24

Table 2.7.3: Transformation Coefficients (Ct) And Wave Directions (Dir) At P-4 (MLW) 25

Table 2.7.4: Transformation Coefficients (Ct) And Wave Directions (Dir) At P-4 (MHW) 25

Table 3.1-1: Probable Breakwater Maintenance Cost 27

FIGURES

Figure 2.2-1: Wave Height Rose for Cape Mendocino Buoy 4
Figure 2.2-2: Wave Period Rose for Cape Mendocino Buoy 5
Figure 2.3-1: Offshore Wave Model Domain (NSW Model) 8
Figure 2.3-2: Wave Transformation For NNW Through W Directions (9.8 ft @ 12 sec) 9
Figure 2.3-3: Wave Transformation For WSW Through S Directions (9.8 ft @ 12 sec) 10
Figure 2.4-1: Nearshore Wave Model Domain (PMS Model) 13
Figure 2.4-2: Model Bathymetry near the Vicinity of the Breakwater 14
Figure 2.4-3: Nearshore Wave Transformation – Existing Conditions (7.5 ft @ 12 sec, MHW) 15
Figure 2.4-4: Nearshore Wave Transformation – Alternative 1 (7.5 ft @ 12 sec, MHW) 16
Figure 2.4-5: Nearshore Wave Transformation – Alternative 3 (7.5 ft @ 12 sec, MHW) 17
Figure 2.7-1: Wave Diffraction and Refraction around Point Delgada (1981 photograph) 22
Figure 2.7-2: Wave Transformation from Offshore to Nearshore 26

1. INTRODUCTION

1.1 BACKGROUND

This report presents the results of coastal engineering analyses conducted for the Shelter Cove Breakwater Rehabilitation Project. The breakwater, which was constructed during the late 1970's to protect the boat launch ramp, has deteriorated over the past 25 years. The study was conducted for the Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD), who has been the lead agency for several projects at the Shelter Cove Boat Launching Facility since the late 1970s. The objective of the Breakwater Rehabilitation Project is to make it safer for launching and retrieval of boats from the Shelter Cove Boat Launch Ramp in a manner that surfing and other environmental resources in the vicinity are not impacted.

Moffatt & Nichol had earlier completed an Engineering Feasibility Study for the same project (M&N 2004) for the HBHRCD. Three breakwater improvement alternatives, as listed below, were presented and evaluated at a preliminary level in the feasibility study.

Alternative 1: Repair In Place
Repair the breakwater in place, raising the crest elevation from approximately 4.5 feet NGVD to 9.5 feet NGVD – similar to the 1979 condition. The rationale for this alternative was to maintain the original breakwater dimensions, thereby providing the same level of protection as before.

Alternative 2: Repair and Extend
Repair the breakwater in place as for Alternative 1, and extend the outer leg by approximately 80 feet. The objective of this alternative was to enhance the level of protection at the concrete launch ramp, such that it would be more protected than the original construction.

Alternative 3: Realign Outer Leg
Repair the breakwater as for Alternative 1, but realign the outer leg to be shore parallel. The rationale for this alternative was to increase the size of the protected basin, such that it would provide safe harbor as well as allow launching/retrieval at lower tides than at present, while minimizing any changes to the local wave regime.

The analyses completed for the Feasibility Study concluded that, for the predominant wave conditions considered, Alternatives 1 and 3 would meet the performance objectives of the breakwater rehabilitation (enhance protection from waves while minimizing other environmental impacts). Alternative 1 would bring the breakwater back to as-constructed conditions (ca. 1979), and Alternative 3 would provide similar wave protection while increasing the basin area protected from waves by about 13% (equates to about 10,000 ft^2) . It was also recognized that additional analyses, which would encompass the complete range of wave conditions occurring at the site, would be necessary during design to confirm that environmental impacts are truly negligible.

At a public meeting in Shelter Cove, several boaters expressed interest in having the larger protected basin resulting from Alternative 3 if it did not negatively affect other resources. Subsequently, a Notice of Preparation and Initial Study, with Alternative 3 being the preferred alternative, was prepared by the HBHRCD and circulated for public

and agency review and comment. Comments on the Initial Study were largely related to potential negative impacts on surfing at Wash Rock, potential for bluff and beach erosion in the area, quantification of improvements to navigation, and impacts to the littoral sand system. Many of the comment letters expressed a bias towards Alternative 1 rather than Alternative 3, because of uncertainties associated with a larger footprint of breakwater.

The coastal engineering analysis conducted as part of this study was conducted to specifically address the comments received on the Initial Study.

1.2 SCOPE OF WORK

The following scope of work is included in the report:

A) Assess Effect Of Breakwater Rehabilitation On Launch Operations

1. Develop a large scale numerical offshore wave model, conduct wave transformation simulations for a range of offshore wave heights, periods and directions to determine wave characteristics jut offshore of Shelter Cove.
2. Use a combination of the above results and the existing wave models developed for the Feasibility Study to simulate local wave characteristics in the vicinity of the breakwater and Wash Rock. Compare results for Alternatives 1 and 3 to Existing Conditions.

B) Assess Effect Of Breakwater Rehabilitation on Surf Conditions At Wash Rock

1. Conduct a hydrographic survey around Wash Rock.
2. Use the existing PMS wave model to simulate wave characteristics (height and direction) in vicinity of Wash Rock for different tidal elevations, incident wave heights, periods and directions. Compare results for Alternatives 1 and 3 to Existing Conditions.

C) Assess Impact On Beach And Bluff Erosion At Pt. Delgada

1. Qualitatively describe morphologic processes in the vicinity of Pt Delgada, based on the wave model simulation results obtained from Task A) and B), other similar studies along the coast, and published scientific principles, experiences and judgment with the objective of comparing Existing Conditions to the proposed Alternatives.

D) Develop Operations & Maintenance Costs

1. Conduct a conceptual analysis of long-shore and cross-shore sediment transport processes, and identify potential sedimentation and erosion areas.
2. Develop a cost estimate for breakwater repair and maintenance dredging.

E) Discuss Construction Logistics and Methods

1. Develop a construction scenario by coordinating with regulatory agencies, potential contractors, District staff and the environmental consultant.
2. Discuss material transportation routes, access issues, equipment type and potential methods of construction.

2. BREAKWATER REHABILITATION INFLUENCES

2.1 ANALYSIS APPROACH

For the purpose of assessing effects and performance of the breakwater, it is important to understand the full range of local wave characteristics in the project vicinity and the subsequent effects of the proposed breakwater rehabilitation project. In order to analyze local waves, it is necessary to understand how waves are transformed from offshore to the beach. Since waves can come from many directions, the full direction range of offshore waves needs to be considered. Due to the highly irregular bathymetry off the coast, numerical modeling techniques were applied to analyze the wave transformation from offshore to nearshore regions.

For any numerical model, good boundary conditions (wave height and period) at the edges of the model domain are required. Since offshore wave data are available from the Cape Mendocino Buoy, which is about 20 miles west of Cape Mendocino, the offshore wave model domain has to be extended west to where the buoy is located so that the wave buoy data can be used as boundary conditions for wave model input. However by doing this the offshore wave model domain has to be very large (see Figure 2.3-1), and it is difficult to resolve local coastal features such as Wash Rock which is less than 50 feet wide at mid-tide, and the breakwater which is less than 400 feet in length. One practical method is to divide the wave simulation into two stages as described below, which is what was done for this study :

1. First, simulate wave transformation from the buoy to an intermediate location closer to the shoreline. Simulated wave results then can be extracted at this intermediate location. The intermediate location selected was about ½ mile south of the project site, in water depths of about 30 feet (see Figure 2.3-1);
2. Second, develop a nearshore wave model, which only needs to extend from the intermediate location described above to the shoreline, which can resolve the local coastal features and bathymetry well. The extracted wave results from the first step are used as boundary conditions to drive the nearshore model (see Figure 2.4-1).

2.2 OFFSHORE WAVE CONDITIONS

The Coastal Data Information Program (CDIP) includes data from the Cape Mendocino Buoy. A wave rose from about 1 year's worth of data (Mar 1999 to Feb 2000, and Jan 2004 to Feb 2004, see Figure 2.2-1) shows that waves come predominantly from the west through northwest directions (about 81% of the time), with the balance from the south to southwest directions. A wave period rose for the same data is shown on Figure 2.2-2. The maximum recorded wave height was on 10/28/1999 with a significant wave height of 9.42m and a peak wave period of 16.67 seconds from the WNW direction. Average monthly wave heights and periods are summarized in Table 2.2.1. The data show that, on average, wave heights and periods in the summer are smaller than the rest of the year. The significant wave height and peak wave period for the Jun-Aug period is about 1.86m and 9.3 second, while for the rest of the year it is about 2.7m and 11.4 seconds.

The data set does not include extreme wave data during El Nino years, but overall it is considered representative of typical conditions, and can be used for the wave modeling analysis. The Feasibility Study had also included wind data and a wind rose, which is not repeated here.

Table 2.2.1: Average Monthly Wave Height and Period at Cape Mendocino Buoy

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Hs (m)	2.76	2.91	3.01	2.60	2.03	2.03	1.95	1.61	2.21	2.58	2.79	3.23
Mean Tp (s)	11.80	12.78	12.59	10.92	9.89	9.79	9.20	8.89	9.91	11.26	11.46	12.11

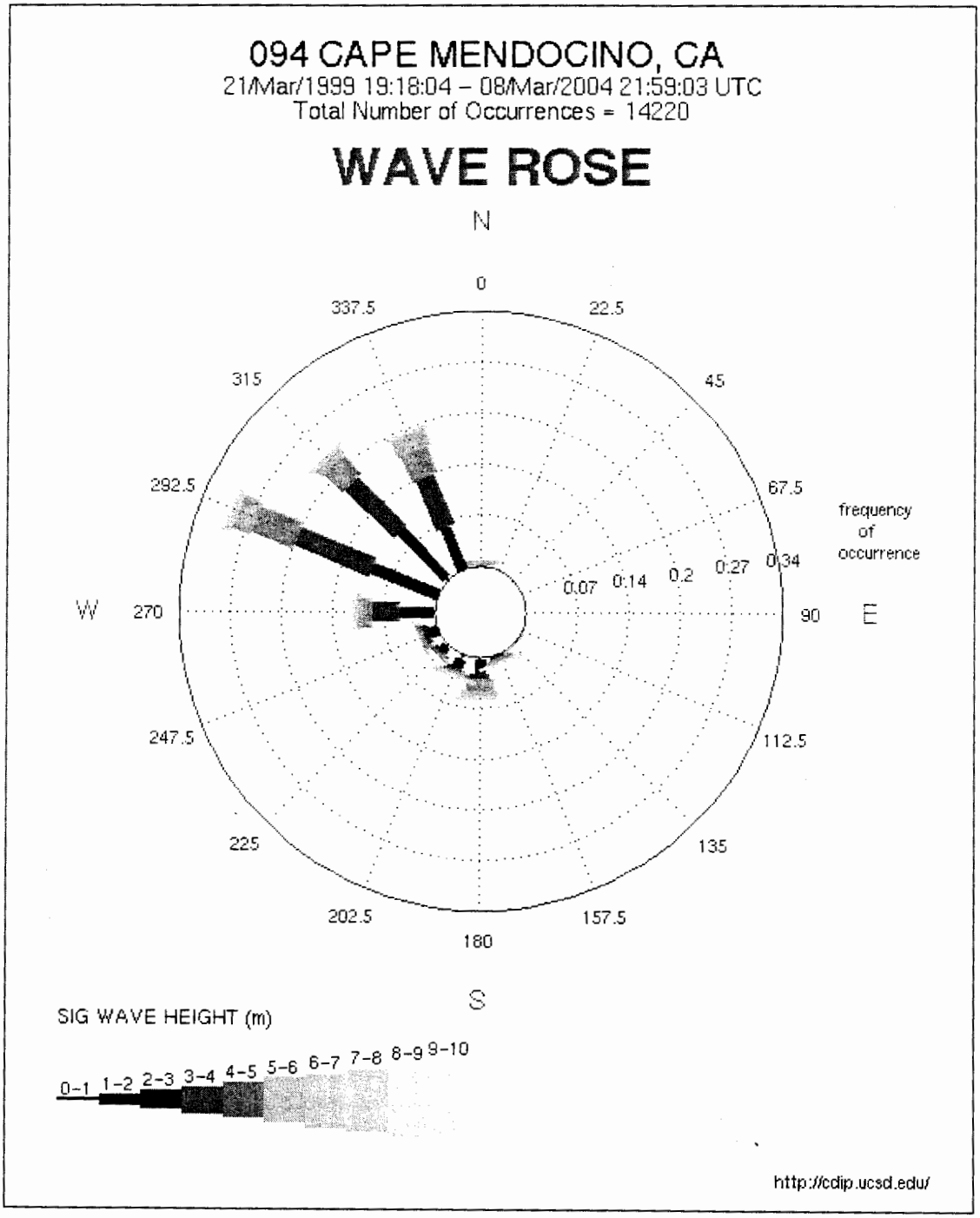


Figure 2.2-1: Wave Height Rose for Cape Mendocino Buoy

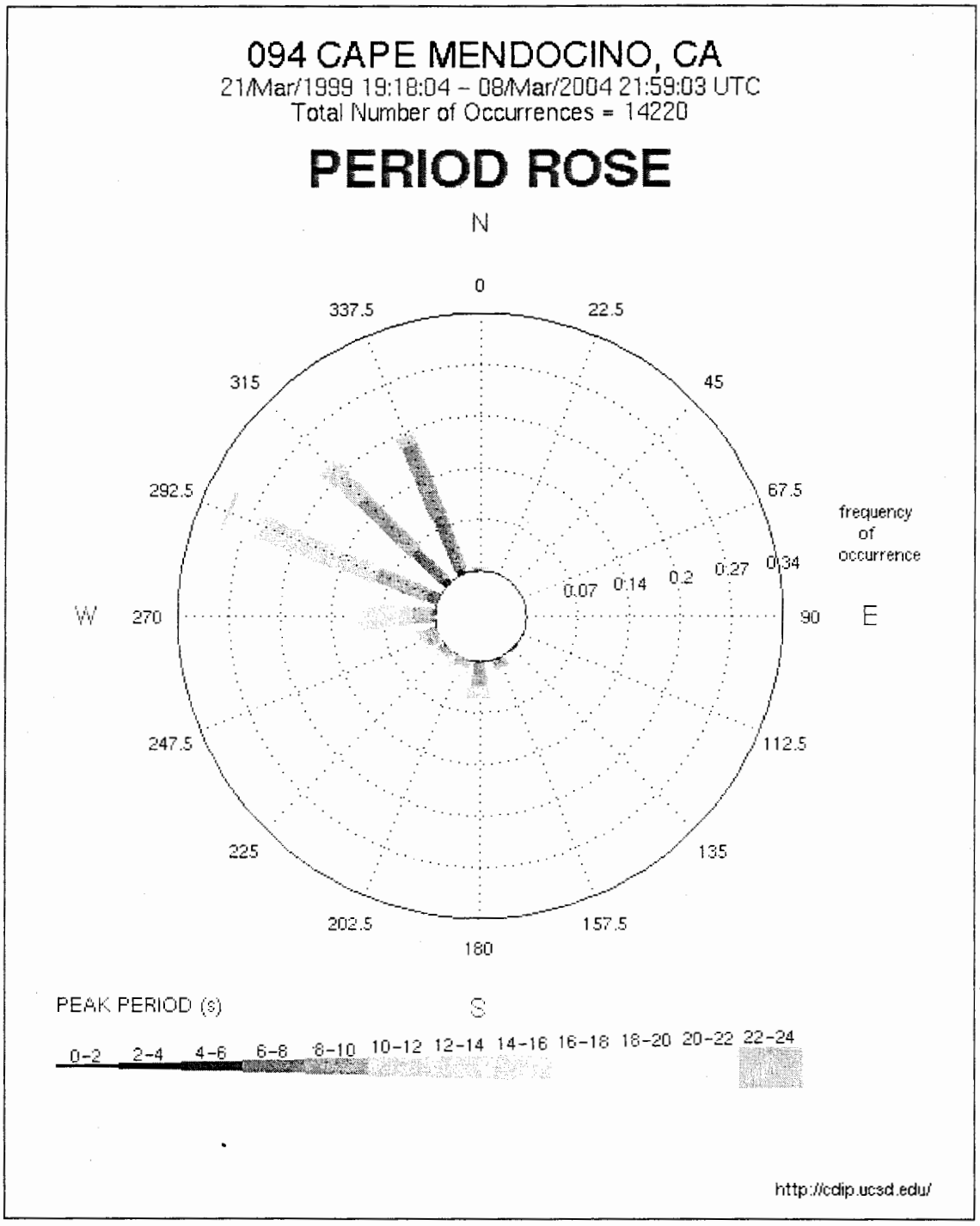


Figure 2.2-2: Wave Period Rose for Cape Mendocino Buoy

2.3 NUMERICAL SIMULATION OF OFFSHORE WAVE TRANSFORMATION

To simulate offshore wave transformation, a two dimensional finite difference rectangular grid wave model, MIKE21 NSW, was used. The NSW model is a spectral wave model that describes the propagation, growth and decay of swells and wind waves. The model takes into account the effects of refraction and shoaling due varying water depth, local wind generation and energy dissipation due to bottom friction and wave breaking. NSW is a stationary, directionally decoupled parametric model. It requires input of bathymetry, water surface elevation, incident wave conditions, bottom friction and wave breaking parameters. The basic output from the model is integral wave parameters such as significant wave height, mean wave period and direction, etc.

The model bathymetry file was developed based on NOAA Chart 18620, Pt. Arena to Trinidad Head [Reference 2]. For computational efficiency, a 20-meter grid spacing in the X direction and an 80-meter grid spacing in the Y direction were selected for the offshore wave model.

Like most wave models, the model requires input waves from the model left boundary within a relatively narrow angle band. For incident waves from many directions, separate bathymetry files are usually required. The offshore buoy data show that 99% of waves come from directions between 180° and 337.5°. Therefore eight wave directions (180° ~ 337.5°) were simulated. For this purpose, three offshore wave model domains were established, as shown in Figure 2.3-1. For waves from 292.5°, 270°, and 247.5°, model domain 1 was used. For waves from 337.5° and 315°, model domain 2 was used. For waves from 180°, 202.5° and 225°, model domain 3 was used.

The wave and period roses indicate that about 70% of the time waves are less than 10 feet high, and about 85% of the time the period is shorter than 15 seconds. Since wave transformation is primarily affected by wave period and depth, 2 wave periods were simulated (12 seconds and 15 seconds). An input wave height is also required in the model, therefore a wave height of 10 feet was used. A tide equivalent to Mean High Water level (+2.1 feet, NGVD) was used in the analysis. A total of 16 offshore wave simulations were therefore conducted to (8 directions x 2 wave periods).

Waves transform in height and direction as they approach the coast, and tend to become more parallel to the bottom contours nearshore. Waves approaching perpendicular to the shoreline (shore normal waves) tend to *shoal* and increase in wave height until they break. Waves approaching at an angle to the shoreline *refract* and reduce in wave height as they change direction to become more shore normal. The amount of shoaling and refraction is also significantly dependent on the period of the waves (long period waves feel the bottom quicker than short period waves). Wave transformation is therefore a function of wave direction, water depth, and wave period.

Figure 2.3-2 and Figure 2.3-3 present simulated wave transformation patterns for all eight incident directions described above. Results are shown for an incident wave height of 9.8 feet and a wave period of 12 seconds (15 second wave periods were simulated, not shown). For presentation purposes, the wave pattern maps in the figures are subsets extracted from the offshore wave model results, and rotated so that true north points upward. Results of the simulations are also summarized in Table 2.3.1. The parameters *"Wave Transformation Coefficient"* (defined as the ratio of the transformed wave height to the incident wave height) and *"Wave Direction at 30-ft*

Contour" (signifying change in direction between offshore and the 30-ft contour) were used to characterize the transformation of waves as they approach the coast.

The results show that waves from the WNW through NNW directions refract substantially as they approach the coast (for example, NNW waves with 15 sec period reduce to 14% of their offshore wave height as they change about 70^0 in direction), and become more westerly as they approach the coast. Waves from the SW through W directions shoal more than they refract (for example, W waves with 15 sec period increase to 115% of their offshore wave height with a 40^0 change in direction). Waves from the S through SSW directions do not change appreciably in height or in direction.

In other words, for northwest and south waves, wave refraction dominates over shoaling, while for westerly waves, wave shoaling dominates over refraction. A significant conclusion that can be drawn from the results is that the full direction band of the offshore waves (180° ~ 337.5°) is essentially reduced to a narrow band between 188° and 268° at the 30-ft depth contour. Therefore, for nearshore wave simulation (shallower than 30 feet), it is only necessary to simulate waves from this 188° to 268° direction band to represent the wider offshore wave direction band.

Table 2.3.1: Wave Transformation From Deepwater to 30-ft Depth Contour

Wave Direction (offshore)	Frequency of Occurrence	Wave Period	Transmission Coefficient at 30-ft Contour	Wave Direction at 30-ft Contour
337.5°	18.2%	12s	0.16	268°
		15s	0.14	267°
315°	22.9%	12s	0.31	267°
		15s	0.26	267°
292.5°	30.3%	12s	0.84	238°
		15s	0.86	234°
270°	9.4%	12s	1.05	232°
		15s	1.15	230°
247.5°	3.3%	12s	1.05	228°
		15s	1.20	228°
225°	2.3%	12s	0.98	214°
		15s	1.13	216°
202.5°	5.5%	12s	0.86	199°
		15s	0.91	204°
180°	6.8%	12s	0.85	188°
		15s	0.82	192°
Other	1.3%	-	-	-

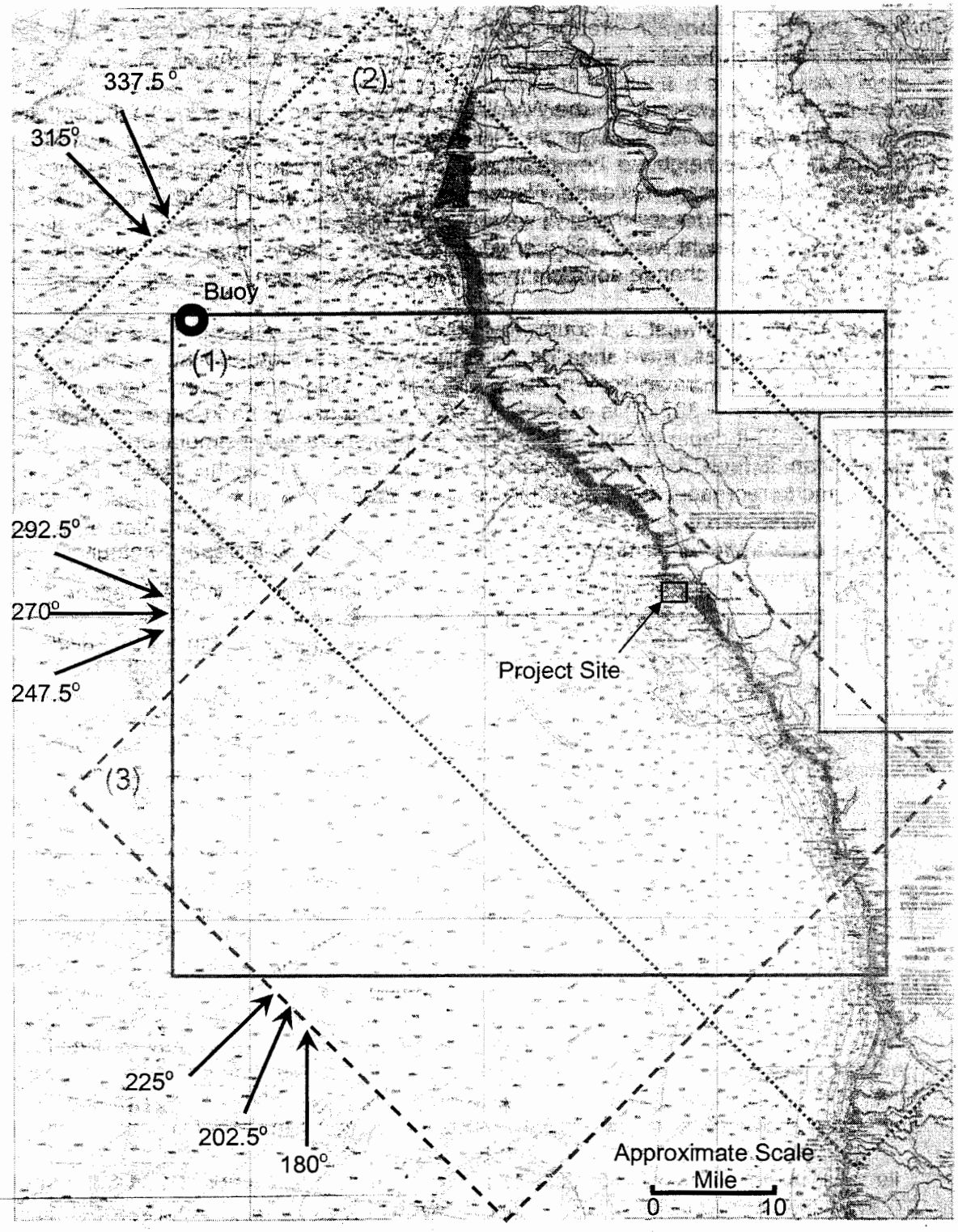


Figure 2.3-1: Offshore Wave Model Domain (NSW Model)

2.4 NUMERICAL SIMULATION OF NEARSHORE WAVE TRANSFORMATION

As shown in the previous section, wave directions at 30-ft water depth are confined to a narrow direction band between 190° and 270°. To simulate waves coming from within these directions, two nearshore wave model domains were constructed. The nearshore domain 1 was used for simulating waves coming from 180°, 200° and 220° directions and the nearshore domain 2 was used for simulating waves coming from 240° and 260° as shown on Figure 2.4-1.

The PMS wave model, originally developed for the Engineering Feasibility Study, was refined to better resolve important local features such as the breakwater and Wash Rock. A 2-meter grid spacing in both X and Y directions was used for the model. The model bathymetry file used for the Engineering Feasibility Study was updated with more recent survey data around Wash Rock obtained from November 2005, which was applied for this study.

The PMS model is a two dimensional rectangular grid finite difference wave model. The model takes into account the effects of refraction and shoaling due to varying depth, diffraction along the perpendicular to the predominant wave direction and energy dissipation due to bottom friction and wave breaking. The basic input data are bathymetry, water level, incident wave condition and various parameters such as bottom friction coefficient and wave breaking parameters. The basic output data from the model are integral wave parameters such as the significant wave height, peak wave period and mean wave direction.

The incident wave boundary conditions for the nearshore wave model were obtained from the offshore wave simulation results described in the previous section, and results from the nearshore wave model were used to analyze the impact of the proposed breakwater rehabilitation project.

Existing conditions, and the two alternatives, Alternatives 1 and 3 [Reference 1] were analyzed in this study.

Four numerical stations were established and simulated wave transformation coefficients and wave directions at these stations were extracted from the model results and compared for both alternatives and existing conditions to evaluate the significance of the breakwater rehabilitation on launch operations, surf conditions near wash rock, and bluff erosion near Pt Delgada. The locations of these stations are shown in Figure 2.4-2 and are described as follows:

Within Harbor (to assess effects on launch operations)

- Station P-1 - located just on the leeward side of the tip of the breakwater and close to the channel, in a water depth of about 6 feet NGVD. Currently, boats launch at this point at low tide.
- Station P-2 - located near the concrete launch ramp, in a water depth of 2 feet NGVD. Currently, boat launches at this point at high tide.

Near Wash Rock (to assess effects on surf conditions)

- Station P-3 - located near wash rock in a water depth of about 7 feet NGVD, is used to evaluate the surf conditions in this area.

Near Pt Delgada (to assess effects on bluff erosion)

- Station P-4 - located between Pt Delgada and the breakwater in water depths of about 4 feet NGVD, is used to evaluate the effect of the breakwater on sediment processes west of the breakwater.

Since the nearshore water depth is shallow, wave breaking, in addition to refraction, diffraction and shoaling, will occur. The wave height transformation coefficient will largely dependent on the incident wave condition and water depth, as well as wave direction and breakwater configuration. Therefore, the following wave height/period, direction, water level and breakwater alternative combinations were considered in the simulation.

- Incident Wave Height/Period: 3.3 feet/9 seconds, 7.5 feet/12 seconds.
- Incident Wave Direction: 180°, 200°, 220°, 240°, 260°.
- Water Surface Elevation: Mean High Water (+2.1' NGVD), Mean Low Water (-2.1' NGVD).
- Breakwater Alternatives: Existing Condition, Alternative 1, Alternative 3.

Combining the two incident wave conditions, five directions, two water surface elevations, and three breakwater alternatives, a total of 60 simulations were conducted. Representative results for Existing, Alternative 1, and Alternative 3 conditions are presented on Figure 2.4-3, Figure 2.4-4, and Figure 2.4-5 respectively. The incident wave height and period was 7.5 feet and 12 seconds. The incident wave directions were 180°, 200°, 220° and 240°. MHW was used for water surface elevation. The wave height and direction maps shown in these figures are a subset of the entire nearshore model domain for better presentation in the breakwater vicinity. The figures demonstrate that although incident wave directions were from 180° to 240°, they refract such that the incident waves near the breakwater are from the 170° to 180° band.

It can be seen from the Figures that waves in the leeward side of the breakwater, for both Alternatives 1 and 3, are reduced significantly compared to the incident waves. Only a very small amount of wave energy gets around the tip of the breakwater into the harbor. Results are described in more detail in the next section (Section 2.5).

The shoaling of waves near Wash Rock (station P-3) for westerly waves is also seen on the figures, which demonstrates why waves break here most of the time. No discernible changes in wave height, resulting from breakwater rehabilitation, can be observed near Wash Rock. However, results are described in more detail in the Section 2.6.

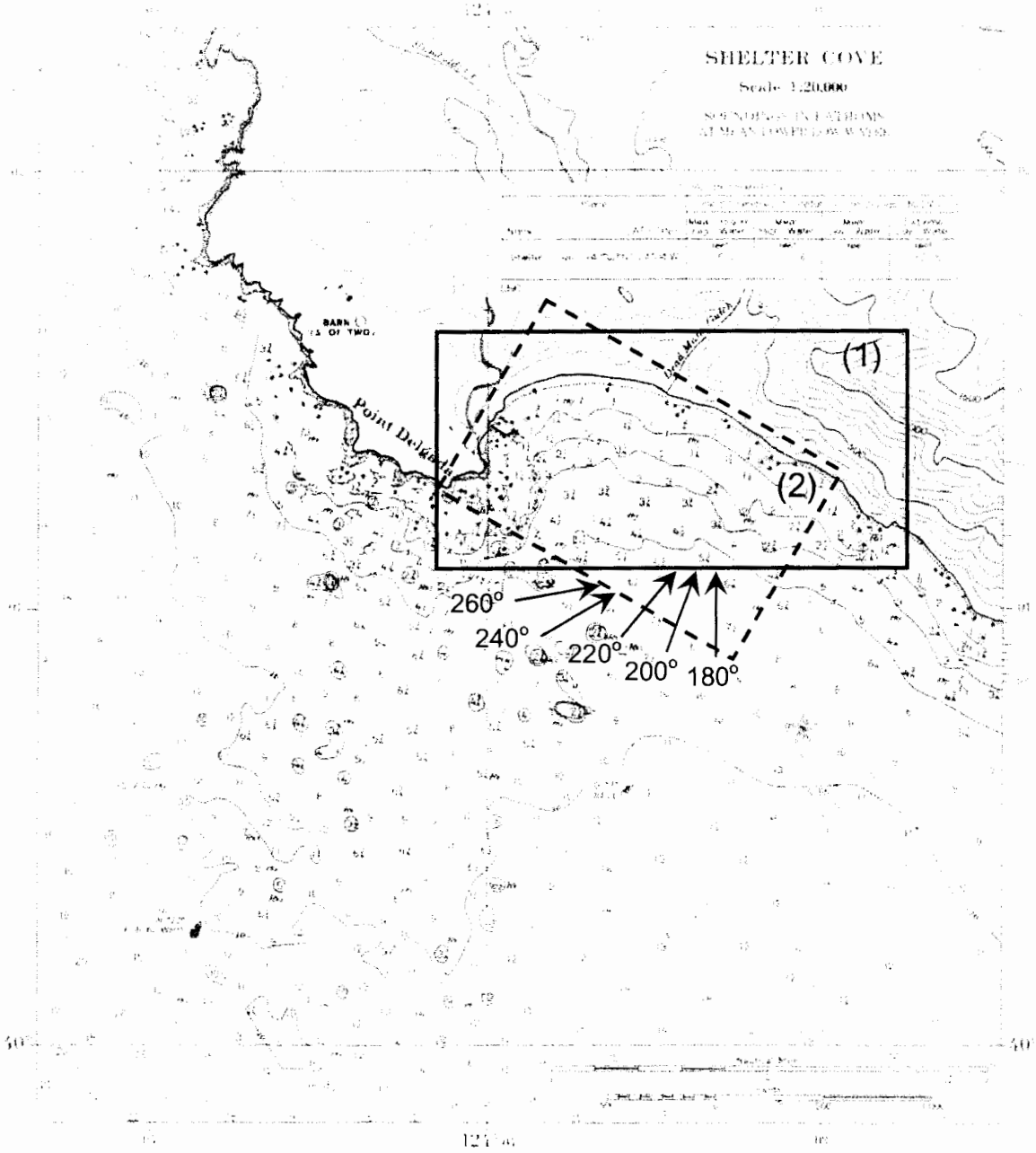


Figure 2.4-1: Nearshore Wave Model Domain (PMS Model)

2.5 IMPROVEMENTS TO LAUNCH OPERATIONS

The existing breakwater at Shelter Cove was constructed many years ago and served well to create a harbor for boaters to launch and retrieve their boats. The existing breakwater was oriented so that it protects the harbor from both northwest and south swells. A concrete launch ramp was constructed to facilitate boat launching. Boats can be self launched by backing the boat down to the water via the concrete ramp or carried by high clearance tractors operated by the local boat launching business so that it can drive further into the deeper water for bigger boats. Sand was accumulating behind the breakwater and the harbor became shallower. At high tide, boats can usually be launched at station P-2 (see Figure 2.4-2), which is close to the concrete ramp. At low tide, boats have to be launched from further out, usually at P-1 which is closer to the end of the breakwater.

Due to large storm wave action, the existing breakwater has been damaged and the larger rocks have fallen off the breakwater, resulting in the lowering of the crest. As a result, it no longer provides as good a protection as it used to for boaters to launch and retrieve their boats at the harbor. When there are over 5 foot swells riding on high tide, the breakwater is submerged and waves overtop the breakwater putting the boaters at risk.

In order to restore the harbor to a safer place for launching, the breakwater has to be rehabilitated. As described above, two improvement alternatives were analyzed in this study. The effectiveness of the proposed breakwater rehabilitation on launch operations was analyzed by comparing the calculated wave height transmission coefficient for the breakwater for alternative conditions with those for the existing conditions. Here specifically, the wave height transmission coefficient for the breakwater was defined as the ratio of the wave height on the lee side of the breakwater to the incident wave height in 30-ft water depth. Waves in the lee side of the breakwater come from two sources: diffraction around the tip of the breakwater and overtopping over the crest of the breakwater. While the diffracted wave was obtained from the nearshore wave model, the transmitted wave due to overtopping was calculated based on the van der Meer and d'Angremond formula [Table VI-5-15 of Reference 3]. The total transmitted wave was calculated using the following formula:

$$C_t = \sqrt{C_{tD}^{\ 2} + C_{tO}^{\ 2}}$$

where,

C_t is the total wave transmission coefficient

C_{tD} is the wave transmission coefficient due to diffraction

C_{tO} is the wave transmission coefficient due to overtopping

The calculated total wave transmission coefficients for the Existing, Alternative 1, and Alternative 3 conditions are summarized in Table 2.5.1. From the table it can be seen that at MLW, the wave transmission coefficients for Alternative 1 are the same as those for Existing Conditions for all incident waves. For Alternative 3, the wave transmission coefficients are the same for those waves coming from 180° and 260°. For waves coming from 200°, 220° and 240°, there is an increase in wave transmission of up to

0.04 (or 4%), which is considered minor. For MHW conditions, wave transmission for both Alternatives 1 and 3 is reduced significantly. The maximum reduction is about 0.23 (or 23%). Therefore boats can launch and be retrieved more efficiently at high tide.

In summary, both Alternatives 1 and 3 result in reduced wave conditions for launch operations at high tide. The overall reduction in wave heights at Station P-2, at high tide, is slightly better for Alternative 1 than Alternative 3. Farther inside the harbor basin, the wave heights are the same for both Alternatives. Alternative 3 provides a larger basin for queuing and berthing of boats. The existing breakwater already protects the harbor well at low tide, therefore the results do not indicate any improvements in breakwater performance at low tide.

Table 2.5.1: Wave Transmission Into Harbor at MLW (P-1) and at MHW (P-2)

Wave Conditions @ 30-ft water depth		Wave Transmission Coefficient (C_t) for:					
		Existing Condition		Alternative 1		Alternative 3	
Direction	Hs(ft), Tp(s)	MLW	MHW	MLW	MHW	MLW	MHW
180°	3.3ft, 9s	0.07	0.36	0.07	0.18	0.07	0.20
	7.5ft, 12s	0.09	0.31	0.09	0.19	0.11	0.21
200°	3.3ft, 9s	0.17	0.42	0.17	0.29	0.21	0.32
	7.5ft, 12s	0.10	0.31	0.10	0.19	0.11	0.21
220°	3.3ft, 9s	0.21	0.43	0.21	0.30	0.25	0.34
	7.5ft, 12s	0.10	0.31	0.10	0.19	0.11	0.21
240°	3.3ft, 9s	0.21	0.38	0.21	0.23	0.24	0.23
	7.5ft, 12s	0.10	0.29	0.10	0.16	0.11	0.16
260°	3.3ft, 9s	0.00	0.32	0.00	0.09	0.00	0.09
	7.5ft, 12s	0.00	0.26	0.00	0.09	0.00	0.09

2.6 EFFECT ON SURF CONDITIONS NEAR WASH ROCK

There were concerns about the potential impact of the breakwater rehabilitation on surf conditions near Wash Rock, which is located about 180 feet northeast from the tip of the existing breakwater. Since the reef near Wash Rock is generally sheltered from northwest swells by Pt. Delgada, waves in this area are gentle and predictable. It is used by children as well as seniors to learn and enjoy surfing. Therefore it is important to assure that the breakwater rehabilitation does not alter the existing surf in this area. Wave height and direction were used to describe surf conditions in the numerical model.

The effect on waves near Wash Rock was evaluated by looking at transformed wave height and direction at Wash Rock (station P-3 in Figure 2.4-2) for all possible incident waves. The wave transformation coefficients and directions at P-3 were obtained from the nearshore wave model results for Existing as well as Alternatives 1 and 3 conditions. Two typical water surface elevations, MLW and MHW were used. The results are summarized in Table 2.6.1 and Table 2.6.2 with the largest changes in bold typeface, and are discussed in the following text. In general, the simulated wave transformation coefficients and directions for Alternatives 1 and 3 are very close to that for Existing Conditions, regardless of incident wave height, period, direction or water level.

Mean Low Water Conditions

For MLW conditions, there is no change in wave conditions for either alternative. This is to be expected because the breakwater is already effective during low to mid tide conditions. The values for the transformation coefficient (C_t) and direction presented in Table 2.6.1 below are identical for all 3 cases.

Table 2.6.1: Wave Transformation Near Wash Rock (P-3), at MLW

Incident Wave @ 30-ft water depth		Wave Height Transformation Coefficients, C_t and Direction at P-3					
		Existing Condition		Alternative 1		Alternative 3	
Direction	Hs(ft) & Tp (s)	C_t at MLW	Dir at MLW	C_t at MLW	Dir at MLW	C_t at MLW	Dir at MLW
180°	3.3ft, 9s	0.70	168	0.70	168	0.71	168
	7.5ft, 12s	0.39	176	0.39	176	0.38	175
200°	3.3ft, 9s	0.57	170	0.57	170	0.57	171
	7.5ft, 12s	0.35	169	0.35	169	0.34	168
220°	3.3ft, 9s	0.78	171	0.78	171	0.78	172
	7.5ft, 12s	0.40	180	0.40	180	0.40	180
240°	3.3ft, 9s	0.79	175	0.79	175	0.79	174
	7.5ft, 12s	0.40	181	0.40	181	0.40	181
260°	3.3ft, 9s	0.25	185	0.25	185	0.26	186
	7.5ft, 12s	0.17	168	0.17	168	0.17	167

Mean High Water Conditions

For MHW conditions, Alternative 1 does not alter wave conditions at Wash Rock. The largest simulated change is for a 240^0 direction, which shows a 0.04 change in C_t

(corresponds to less than a 2-inch change in wave height), and a 3° change in direction. These are not significant numbers.

Although the results show some changes for Alternative 3 compared to Alternative 1, the effect is not considered significant for coastal processes. For example, the maximum change in C_t is 0.09 for waves from 220° which corresponds to about a 3-inch change in wave height. However, waves from a 220° wave approach direction have an occurrence of less than 4% (see Table 2.7.1), and is therefore considered not significant. Similarly, the maximum change in wave direction is 12° for waves from a 180° direction, which again has an occurrence of less than 4% of the time.

Table 2.6.2: Wave Transformation Near Wash Rock (P-3), at MHW

Incident Wave @ 30-ft water depth		Wave Height Transformation Coefficients, C_t and Direction at P-3					
		Existing Condition		Alternative 1		Alternative 3	
Direction	Hs(ft) & Tp (s)	C_t at MHW	Dir at MHW	C_t at MHW	Dir at MHW	C_t at MHW	Dir at MHW
180°	3.3ft, 9s	0.52	165	0.51	**162**	0.49	**153**
	7.5ft, 12s	0.44	160	0.44	160	0.47	167
200°	3.3ft, 9s	1.02	176	1.02	175	1.05	177
	7.5ft, 12s	0.58	168	0.59	168	0.62	174
220°	3.3ft, 9s	1.07	174	1.09	175	**1.16**	180
	7.5ft, 12s	0.61	169	0.62	171	0.63	172
240°	3.3ft, 9s	1.19	181	**1.23**	**184**	1.22	184
	7.5ft, 12s	0.66	182	0.64	181	0.61	178
260°	3.3ft, 9s	0.19	199	0.21	200	0.20	198
	7.5ft, 12s*	-	-	-	-	-	-

* Not Simulated - Occurrence less than 0.5% from this direction (see Table 2.7.1)

2.7 EFFECT ON BEACH AND BLUFF EROSION

2.7.1 Morphology of Shelter Cove

Shelter Cove is a typical hook-shaped bay. This is a very common shape for beaches between two headlands, groins, or other fixed points along the Western US; it is also commonly bounded by areas with erosional bluffs. The shape is variously termed log-spiral, crenulate, or hook-shaped (e.g., References 4 and 5). Point Delgada acts as the upcoast (western) limit for hook-shaped bay that includes Shelter Cove; the rocky outcroppings approximately one mile to the southeast acts as the downcoast (eastern) limit.

The characteristic curved shape of hook-shaped bays arises from the wave conditions at the bay. Consider the arrival of uniform swell waves to a pocket beach – for example, the prevailing northwest waves in the area. The headland on the upcoast side of a hook-shaped bay, which is generally to the north or west in California, blocks waves approaching from the upcoast direction and acts as a diffraction point. This headland is always the most prominent. Diffraction of waves around the headland and refraction of waves as they approach the beach cause the waves crests to curve near this end, giving rise to the curved segment of the shoreline. The downcoast (south or east) structure anchors the other end of the bay; the shoreline is relatively straight near this end.

The aerial photograph in Figure 2.7-1 illustrates this pattern of diffraction and refraction around Point Delgada. The waves are actually diffracted twice: once around Point Delgada, and once around the tip of the breakwater. The swell offshore is from approximately northwest; the wave crests, visible on the left side of this photograph, are essentially straight. As the waves travel around Point Delgada, they turn towards the north and the wave crests become more curved. By the time the waves reach the shoreline in Shelter Cove, the wave crests are curved in an approximate log-spiral shape, and are essentially shore-parallel.

Figure 2.7-1: Wave Diffraction and Refraction around Point Delgada (1981 photograph)

The pattern of wave transformation from offshore to nearshore is also demonstrated on Figure 2.7-2. The figure shows wave roses in different water depths, based on results of the numerical modeling.

2.7.2 Sediment Transport Processes at Shelter Cove

Wherever wave crests strike a shoreline at an angle, they produce a longshore transport of beach sediment. Sediment continues to be shifted alongshore as long as the waves continue to break obliquely to the shore. The equilibrium shape of a shoreline is that for which the breakers are parallel to the beach everywhere along the shoreline – only then is there no longshore transport of sediment. In addition to longshore transport, there is a seasonal transport process called cross-shore transport, which erodes beaches in winter as sand is deposited offshore, and brings back beaches in summer as the offshore sand deposits come back. A beach in *equilibrium* implies seasonal variation in beach width as cross-shore and longshore transport processes occur.

As described above, the Shelter Cove littoral cell is bounded between Pt. Delgada (upcoast control) and the rocky bluff south of the Dead Man's Gulch (downcoast control). There is little sediment coming in and out of the system along the coast (although cross-shore processes continue), and the shoreline change is largely dependent on local processes.

For the study area, a distribution of wave conditions is shown on Table 2.7.1, which gives a summary of the wave height and direction distribution in 30 ft water depth ½ mile south of the breakwater. The table was developed based on wave rose data at the buoy, and numerical simulations of offshore wave transformation.

Table 2.7.1: Wave Height and Direction in 30 ft Water Depth ½ Mile South of the Breakwater (from wave rose at the buoy and offshore wave simulations)

Wave Height (ft)	Direction (from true north)				
	180°	200°	220°	240°	260°
>13.2	0.18%	0.20%	0.27%	3.33%	-
9.9-13.2	0.77%	0.60%	0.32%	3.33%	-
6.6-9.9	0.71%	0.68%	0.56%	7.02%	0.12%
3.3-6.6	1.47%	5.36%	1.62%	12.54%	4.64%
0-3.3	0.32%	2.76%	0.99%	17.76%	34.45%
Total	3.45%	9.60%	3.76%	43.98%	39.21%

From the same wave data, the distribution near the breakwater is shown on Table 2.7.2, which implies that the incident wave direction is limited to a 160^0 to 200^0 band. As the wave approaches the shoreline, the direction changes further such that it induces a northwesterly sand transport (longshore transport). This is the source of sand within the basin in Shelter Cove, as well as for the beach where the breakwater connects to the shoreline. The shore-normal leg of the breakwater interrupts this supply to reaches farther west, upto the Point. South storms in particular drive this sediment into the harbor, where it would normally be deposited onto the beach and move in a onshore-offshore direction as cross-shore transport. The offshore leg of the breakwater does not allow this to happen, and the sand remains within the harbor basin. Occasional

dredging in the harbor has happened over time, and sand taken from behind the breakwater.

Because the breakwater has settled and is overtopped at high tide, there is some sediment transport over the breakwater which has resulted in a small pocket beach west of the breakwater, between the breakwater and the rocky point. The beach does not extend far beyond where the breakwater connects to shore. Although the amount transported over and through the breakwater is small – the pocket beach is not completely isolated from the littoral system of Shelter Cove.

Table 2.7.2: Wave Direction Distribution near the Breakwater Tip

Direction	% Occurrence
160°	3%
170°	12%
180°	45%
190°	20%
200°	20%

If the breakwater rehabilitation project envisioned interrupting this process by constructing shore normal structures, the processes would change. However, the breakwater rehabilitation for Alternatives 1 and 3 will only raise the portion of breakwater beyond the beach. The elevation of the shore connected portion of the inner breakwater leg will remain the same for both concepts so that the long shore sediment transport flow will not be interrupted. The small amount of transport which is leaking out of the basin through and over the existing low crested offshore portion of the breakwater will be interrupted, and will accumulate within the harbor. The sand presently leaking out of the basin is not accumulating outside the basin – the presence of tide pools demonstrates this.

For assessing beach and bluff erosion west of the breakwater, wave conditions in the area (station P-4) were compared. Wave transformation coefficients and directions at P-4 were extracted from the nearshore wave model, and results summarized in Table 2.7.3 and Table 2.7.4.

Table 2.7.3: Transformation Coefficients (Ct) And Wave Directions (Dir) At P-4 (MLW)

Incident Wave		Existing Condition		Alternative 1		Alternative 3	
Direction	Hs(ft) & Tp (s)	Ct at MLW	Dir at MLW	Ct at MLW	Dir at MLW	Ct at MLW	Dir at MLW
180°	3.3ft, 9s	0.13	158	0.13	158	0.13	158
	7.5ft, 12s	0.05	171	0.05	171	0.05	171
200°	3.3ft, 9s	0.14	155	0.14	155	0.14	155
	7.5ft, 12s	0.07	157	0.07	157	0.07	157
220°	3.3ft, 9s	0.07	160	0.07	160	0.07	160
	7.5ft, 12s	0.07	158	0.07	158	0.07	158
240°	3.3ft, 9s	0.12	159	0.12	159	0.12	159
	7.5ft, 12s	0.04	151	0.04	151	0.04	151
260°	3.3ft, 9s	0.02	165	0.02	165	0.02	165
	7.5ft, 12s	0.01	178	0.01	178	0.01	178

Table 2.7.4: Transformation Coefficients (Ct) And Wave Directions (Dir) At P-4 (MHW)

Incident Wave		Existing Condition		Alternative 1		Alternative 3	
Direction	Hs(ft) & Tp (s)	Ct at MHW	Dir at MHW	Ct at MHW	Dir at MHW	Ct at MHW	Dir at MHW
180°	3.3ft, 9s	0.06	148	0.06	147	0.06	147
	7.5ft, 12s	0.12	169	0.12	170	0.12	170
200°	3.3ft, 9s	0.21	152	0.21	152	0.21	152
	7.5ft, 12s	0.13	171	0.13	171	0.13	171
220°	3.3ft, 9s	0.10	179	0.10	179	0.10	179
	7.5ft, 12s	0.06	177	0.06	177	0.06	177
240°	3.3ft, 9s	0.28	168	0.28	168	0.28	168
	7.5ft, 12s	0.11	164	0.11	164	0.11	164
260°	3.3ft, 9s	0.03	193	0.03	193	0.03	193
	7.5ft, 12s	0.02	166	0.02	166	0.02	166

Based on the simulation results it can be concluded that there is no change in wave conditions due to breakwater rehabilitation in the area between Point Delgada and the breakwater. Therefore no adverse effect is expected on the beach and bluff west of the breakwater. Similarly, no changes are anticipated to the beaches east of the launch ramp, because littoral transport processes will not change there.

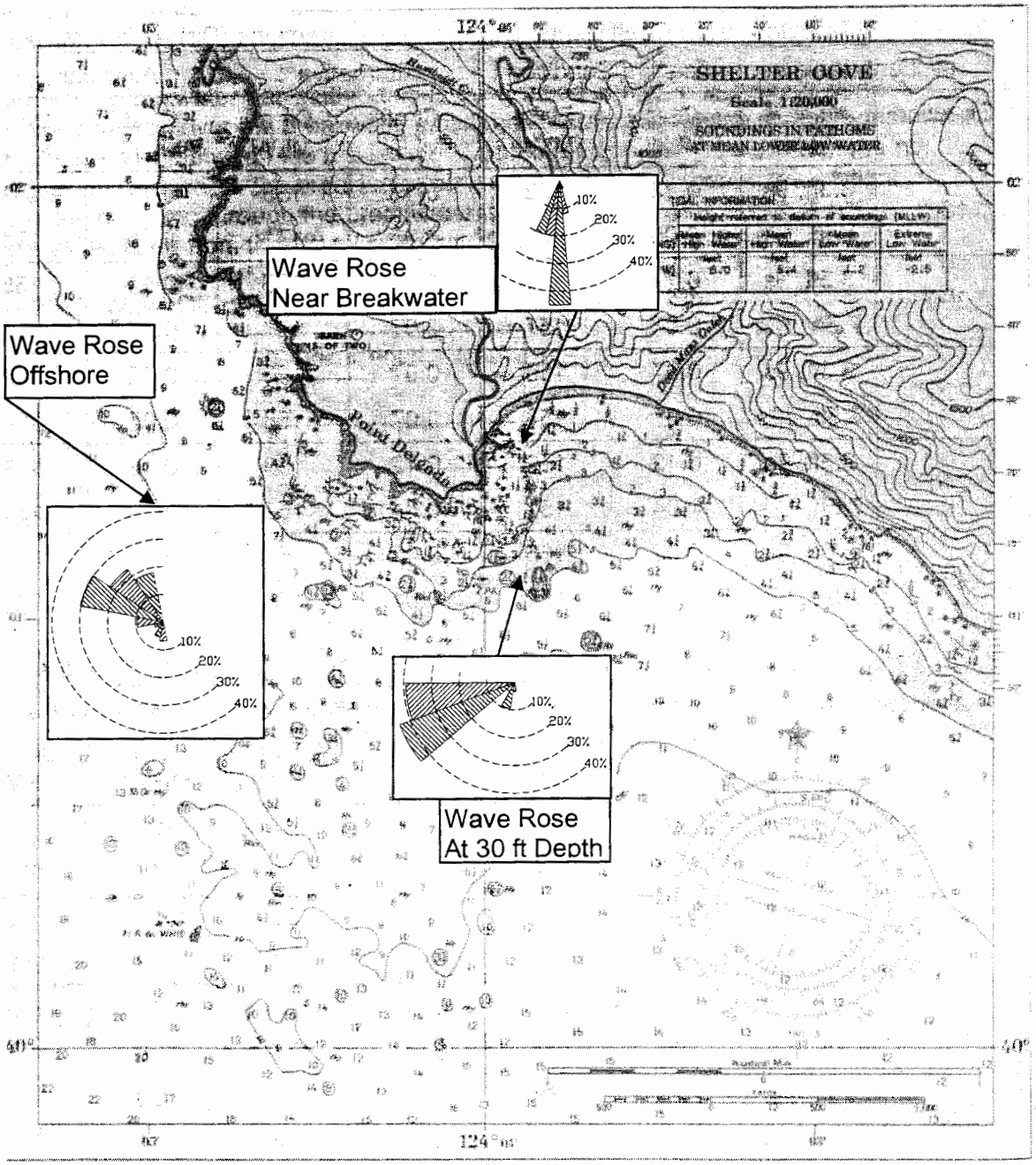


Figure 2.7-2: Wave Transformation from Offshore to Nearshore

3. MAINTENANCE & CONSTRUCTION ISSUES

3.1 OPERATION & MAINTENANCE ISSUES

3.1.1 Breakwater Maintenance Repair

A design wave height of 10 feet was used for determining the breakwater armor protection, which is considered to be a practical extreme wave height. The rehabilitated breakwater may need maintenance as a result of extreme El Nino type of storm wave + surge conditions.

It is assumed that a 5%-10% damage of the armor layer will occur on average every 10 years. Assuming a unit cost of $80 per ton for armor rock repair and 25% contingency, the repair cost for each alternative is shown in Table 3.1-1. We recommend an average annual maintenance budget of about $3,000 be set aside for breakwater repairs.

Table 3.1-1: Probable Breakwater Maintenance Cost

Parameter	Alternative 1		Alternative 3	
	5% Damage	10% Damage	5% Damage	10% Damage
Maintenance Requirement (5-10 Ton Armor Rock)	110 tons	220 tons	160 tons	320 tons
Armor Rock Repair Cost	$8,800	$17,600	$12,800	$25,600
Contingency (25%)	$2,200	$4,400	$3,200	$6,400
Total Maintenance Cost	$11,000	$22,000	$16,000	$32,000

3.1.2 Harbor Maintenance Dredging

Sediment transport is a function of the bed shear stresses imposed by the waves on the bottom. The simulations indicate that for existing condition the waves are reduced to about 35% on average compared to incident waves at 30-ft depth. For Alternative conditions the waves are reduced to about 20% on average compared to incident waves at 30-ft depth (see Table 2.5-1). Standard relationships between wave height, bed shear stresses and potential for depositions indicate that there would be a two-fold increase in potential for deposition for alternative conditions within the harbor resulting from the rehabilitation.

Estimating the true longshore transport would typically require conducting transport calculations for each wave height, period, direction and grain size distribution and performing statistics based on relative rates of occurrence. For this study, recognizing that there is no formal maintenance dredging program for the harbor, we anticipate that there will be a need for maintenance dredging for either of the alternatives. For budgeting purposes, using the results of the simulations and engineering judgment, we recommend that an allowance for dredging about 2000 cubic yards every five years be set aside. This corresponds to less than 6 inches of deposition per year within the deeper part of the basin. This would occur after storms with a southerly component. Using a unit rate of $20 per cubic yard, we recommend that an average annual maintenance budget of about $8,000 be set aside for maintenance dredging.

3.2 CONSTRUCTION ISSUES

The breakwater rehabilitation will take place from land using dozers and other tire/track equipment. Crushed rock will be used to construct an accessible path along the existing crest of the breakwater, and placement will start at the seaward tip of the structure, moving landward. The proposed 11-foot crest width will be wide enough for this. The smaller rocks that have sloughed off the breakwater could potentially be used in place of imported crushed rock for this purpose.

All new rock used in the rehabilitation would be sourced from local quarries, and transported by trucks along Shelter Cove Road. The amount of rock for each Alternative is as follows :

Quantity	Unit	Alternative 1	Alternative 3
3 - 5 ton armor rock	tons	4,240	6,360
500 - 1000 lb rock	tons	650	1,920
6-inch rock	tons	300	1,350
Total imported rock	tons	5,190	9,360

Using a 25-ton capacity for trucks (about 15-17 CY/truck), Alternative 1 implies about 200 round trips between the quarry and the launch ramp. Alternative 3 implies about 375 round trips. The environmental review document for this project should evaluate whether this is an impact of significance.

It is expected that construction for Alternative 1 would last just about 1 month including mobilization and weather delays. Of this, delivery of rock would most likely be about 10-15 days. Alternative 3, if selected, would take about 2.5 to 3 months, with delivery of rock taking place over about 20 days. A staging area would be needed near the top of the bluff to stockpile some of the rock and to store equipment over the construction period.

The construction will have to be timed during periods of low tide and offshore swell, as well as consider the fishing season, when ramp usage is at a maximum.

4. SUMMARY

This study was conducted to address comments received on the Initial Study, with the primary objectives being assessing the effects of rehabilitation on launch operations, surf conditions, and beach/bluff stability for Alternatives 1 and 3. The analysis included numerical simulations for the range of incident wave conditions (height and period) that the breakwater is exposed to, and an assessment of wave transformation parameters at key locations that represent the effects of the breakwater. A summary of the analysis is presented below.

1. Immediately offshore of the Shelter Cove launch facility, the full direction band of the offshore waves (northwest through south directions) is essentially reduced to a southwest quadrant incident wave approach direction. Therefore, for nearshore wave simulation, it is only necessary to simulate waves from this quadrant to represent the wider offshore wave direction band. Results are described in Section 2.3.

2. Alternatives 1 and 3 both result in a reduction in wave energy at high tide in the lee of the breakwater, which will benefit launching/retrieval of boats. Immediately behind the breakwater, the overall reduction in wave heights is slightly better for Alternative 1 than for Alternative 3, primarily because of the alignment of the breakwater. However, Alternative 3 provides a larger basin (about 10,000 ft^2 larger) for queuing and berthing of boats. Farther inside the harbor basin, the wave heights are the same for both Alternatives. The existing breakwater already protects the harbor well at low tide, therefore the results do not indicate any improvements in breakwater performance at low tide. Results are described in Sections 2.4 and 2.5.

3. The analyses for effects at Wash Rock indicate that, in general, wave transformation coefficients and directions for Alternatives 1 and 3 are very close to that for Existing Conditions, regardless of incident wave height, period, direction or water level. Alternative 1 does not alter wave conditions at Wash Rock (simulations for both MLW and MHW conditions indicate no change). Alternative 3 simulations also show no change in wave conditions at Wash Rock for low to mid-tide conditions. For MHW conditions, Alternative 3 shows a 0.04 change in C_t (corresponds to less than a 2-inch change in wave height), and a 3° change in direction, which are not significant numbers. Results are described in Section 2.6.

4. The breakwater rehabilitation concept for both alternatives envision raising the portion of breakwater beyond the beach. The elevation of the shore connected portion of the inner breakwater leg will remain the same for either alternative, so that the long shore sediment transport flow will not be interrupted. As a result, the simulations indicate no change in wave conditions due to breakwater rehabilitation in the area between Point Delgada and the breakwater. Therefore no adverse effect is expected on the beach and bluff west of the breakwater. Similarly, no changes are anticipated to the beaches east of the launch ramp, because littoral transport processes will not change there. Results are described in Section 2.7.

5. Alternative 3 has a higher capital cost because of the lager structure, as well as a higher operations and maintenance cost associated with repairs and dredging (see Section 3.1). However, it provides a larger basin area for queuing of boats.

6. Since Alternative 3 envisions a larger construction operation and a longer construction duration, traffic and noise effects need to be evaluated. In addition, since the footprint of the structure is larger than at present our experience suggests that it will be subject to greater scrutiny by regulatory and resource agencies, as well as environmental groups, because it will be perceived as an *Improvement Project* rather than a *Rehabilitation Project*. Also, the benefits of a larger basin (increase in number of boats being able to launch or be retrieved) will need to be evaluated against the cost of implementing this alternative.

REFERENCES

1. Moffatt & Nichol, Shelter Cove Breakwater Rehabilitation Project, Engineering Feasibility Study, Prepared for Humboldt Bay Harbor, Recreation and Conservation District, January 12, 2005.

2. National Oceanic And Atmospheric Administration, National Ocean Service, Nautical Chart 18620, Pt. Arena to Trinidad Head, 20th Ed., December 28, 1991.

3. U.S. Army Corps of Engineers, Coastal Engineering Manual, Engineer Manual 1110-2-1100, U.S. Army Corps of Engineers, Washington, D.C.

4. Silvester, R. and S.K. Ho. 1972. Use of Crenulate-Shaped Bays to Stabilize Coasts. Proceedings of the 13th Coastal Engineering Conference, ASCE, pp. 1347-1365.

5. Everts, C.H., and C.D. Eldon. 2002. Sand Management in Hook-Shaped Bays. California and the World Ocean '02 Conference Proceedings, Ocean Resources Management Program, California Resources Agency.

EXHIBIT 6

Shelter Cove Breakwater Rehabilitation

Maintenance Dredging and Disposal Plan

Maintenance dredging of the launch area will consist of scraping the protected area while exposed during low tides to remove occasional and sporadic accumulated sand shoals. This maintenance requirement is estimated at about 2,000 cubic yards every five years, or less than 6 inches of deposition per year within the deeper portion of the protected area. Accumulated sand removal will be accomplished during low tides while the bottom is not submerged using equipment such as a loader, excavator, or blade to move the excess sand from the protected area of the breakwater to the small sandy area of the beach within the high-tide zone adjacent to the southwest side of the breakwater (the receiver site). This would bypass the sand over the sand-transport obstacle created by the breakwater, allowing the bypassed sand to be picked up gradually by high tides and transported offshore in the currents. Sand removal is expected to be occasional and sporadic, based largely on episodes of ocean conditions that create a fairly sudden accumulation of sand on the northeast side of the breakwater, although the breakwater is designed to allow sand flow. Specific measures, described below, will be taken to minimize potential environmental impacts.

SUITABILITY OF DREDGE SPOILS FOR DEPOSITION AT THE RECEIVING SITE

Sampling will be conducted to ensure that the grain size of the dredge spoils is similar in size to the grain size at the receiving site. If the percent composition of silt, clay, or sand of the dredge spoils differs by >10% from the percent composition of silt, clay or sand at the receiver site, than the dredge spoils will be deposited at an upland disposal site outside of the coastal zone.

Sampling Method

Sampling will be conducted immediately prior to each dredging activity. Samples will be collected using a drive-tube methodology. A sediment sampler designed and manufactured by AMS Inc. will be utilized. This sampler consistently collects undisturbed samples without contaminating samples. A minimum of 12 random samples and a total of 150 grams of sediment will be sampled from the dredge site and the receiving site. Grain size distribution will be determined by sieve analysis for particles greater than 63 micrometers and less than 32 millimeters[1].

[1] Plumb R. H., 1981, Procedures for handling and chemical analysis of sediment and water samples, Technical Report EPA/CE-81-1, prepared for Great Lakes Laboratory, State University Collage at Buffalo, NY, for the USEPA/ Corps of Engineers Technical Committee on Criteria for Dredged Materials. Published by US Army Engineer Waterways Experiment Station, Vicksburg, MS.

Below 63 micrometer particle sizes will be determined based upon settling rates, using a pipette method.

CONTAMINATED SEDIMENT REMOVAL

Total petroleum hydrocarbons (TPH) of dredge spoils will be sampled prior to each dredging event. The table below outlines the methods that will be used for assessing TPH and the maximum TPH limit to allow for the dredge spoils to be deposited at the receiving site. If this limit is exceeded, the spoils will be legally disposed of at an appropriate upland location outside of the coastal zone.

Total Petroleum Hydrocarbons	Method	Maximum Limit to Allow for Disposal at the Receiving Site
Gasoline	EPA Method 5030	10 mg / kg
Diesel (with Silica Gel Cleanup)	EPA Method 3550	50 mg / kg
Motor Oil (with Silica Gel Cleanup)	EPA Method 3550	50 mg / kg

INTERFERENCE WITH COASTAL RECREATION AND FISHING

The grain size of sediment at the receiving site will not be altered. The elevation will be slightly raised for a short time period, not expected to be more than a few high tide cycles. This is not expected to have a significant impact on coastal recreation or fishing. The recreation and fishing benefits of the rehabilitated breakwater will greatly surpass any temporary impacts that result from the maintenance dredging activities or other actions associated with this activity.

ALTERNATIVE ANALYSIS

An alternative to depositing the dredge material at the suggested receiving site would be to dispose of all dredge material at an upland location outside of the coastal zone. However, depositing the dredge spoils at the receiver site roughly simulates natural sand transport and is therefore considered the preferred method.