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TO: Coastal Commissioners

FROM: Peter Douglas, Executive Director
Mark Delaplaine, Federal Consistency Supervisor

DATE: February 29, 1996

SUBJECT: **ATOC** Status Update - Proposed Modifications
Scripps Institution of Oceanography (Scripps)
Acoustic Thermometry of Ocean Climate Project (ATOC) and Marine Mammal Research Program (MMRP)

NOTE: MINOR SCHEDULING REVISION This Executive Director report item is being rescheduled to Friday, March 15, 1996, 9:00 a.m., rather than Wednesday, March 13, 1996.

Background

On December 1, 1994, Scripps submitted a consistency certification to the Coastal Commission for the ATOC/MMRP project, located at Pioneer Seamount, 48 miles offshore of Half Moon Bay, with a power cable to shore at Pillar Point in San Mateo County (Exhibits 1 & 2). On June 15, 1995, the Coastal Commission concurred with Scripps' consistency certification (CC-110-94). A summary of the Commission's action is attached (Exhibit 4).

On October 28, 1995, Scripps commenced ATOC transmissions in a series of 12 tests occurring over a 5-day period. A number of concerns were raised by these tests, including: (1) inadequate notification of the commencement of operations to permitting agencies that had required such notification (e.g., the National Marine Fisheries Service (NMFS)); (2) inadequate coordination with and control over the transmissions by MMRP biologists, who were supposed to be in control of the transmissions according to Scripps' commitments to the Commission, federal permitting agencies, and other interested parties; and (3) the discovery of three dead humpback whales in the greater project vicinity (one at Stinson Beach and two off the Farallones Islands), all of which appeared to have died near the dates on which the ATOC transmissions took place. On November 28, 1995, NMFS issued a report analyzing the whale deaths, concluding:

> Based on the available information, ... NMFS ... is unable to determine the cause or causes of the recent humpback whale deaths.... However, ... NMFS ... does not believe that the engineering tests of the ATOC sound source were responsible for the humpback whale deaths.

On November 30, 1995, Scripps revised the project to include additional measures that had been recommended by the MMRP Advisory Board (Exhibit 5), including: (1) clearer MMRP oversight of the project; (2) improved plans for responses to any marine mammal strandings; (3) independent monitoring of the cable power output to enable verification of the source strength and transmission schedule; and (4) public disclosure of all future changes to the

transmission schedule. On November 30, 1995, NMFS authorized resumption of the transmissions (i.e., commencement of the normal ATOC/MMRP schedule), and on December 2, 1995, Scripps commenced normal ATOC/MMRP transmissions. On December 13, 1995, the Commission discussed the matter during an Executive Director report, took public testimony, and authorized sending a letter to NMFS and the Monterey Bay National Marine Sanctuary (MBNMS) urging both agencies to strictly enforce all conditions and mitigation measures contained in their respective permits for the ATOC/MMRP project.

Proposed Modifications

Scripps has submitted a "No Effects" letter (NE-16-96) describing what it considers to be a "minor modification" to the ATOC/MMRP project, as follows:

> During a 12-day period [in June 1996], Scripps proposes to suspend operations of the fixed ATOC sound source and instead undertake an alternate source test using a ship-suspended [i.e., boat based] sound source approximately 10 nautical miles southwest of Pioneer Seamount. The alternate test source will have the same total power output as the current fixed source (195 dB) but divided between two frequency bands at 25 Hz [Hertz] and 75 Hz [75 Hz is the standard ATOC/MMRP frequency]. The purpose of testing the alternate source, generally, is to test the propagation characteristics at the alternate source frequency and to evaluate potential impacts of the dual frequency sound source on marine mammals in the Pioneer Seamount vicinity.
>
> The alternate sound source will have the same total power output as the fixed ATOC source (split between two frequencies), and will operate at only a slightly higher duty cycle (approximately 8% rather than 3%) for a brief, 12-day period.

The mitigation and monitoring measures accompanying the normal ATOC/MMRP operations would remain in place during the modified operation, including MMRP monitoring (e.g., visual surveys, vessel-based visual and acoustic monitoring before, during, and after the operation), source shutdown criteria, and use of a 5 minute ramp up period. The proposed schedule and accompanying mitigation/monitoring measures are discussed in the Research Protocol (Exhibit 3).

Procedures

The ATOC sound source is located well outside the coastal zone. The coastal zone extends 3 miles offshore of the mainland and 3 miles offshore of each of the Farallones Islands. On March 10, 1995, the Office of Ocean and Coastal Resource Management (OCRM) confirmed the Commission's federal consistency jurisdiction over the ATOC sound source, by ruling that the ATOC project "can be reasonably expected to affect marine mammals of the coastal zone, including the humpback and blue whales that are sensitive to low frequency noise and which swim at depths where the noise would be audible." OCRM therefore granted the Commission permission to review Scripps' application for a MBNMS permit renewal for the project. The primary action before the Commission was

the activity (and its associated facilities) covered under the federal (MBNMS) permit(s) for this project. The Commission's concurrence with CC-110-94 included the following discussion:

> Finally, additional federal consistency review by the Commission will be triggered in the event that: (1) Scripps makes any significant modifications to either (a) the MMRP or other mitigation measures or (b) the ATOC project itself; (2) any evidence materializes documenting adverse effects on marine resources "substantially different" than those originally proposed ...; or (3) any extension [is proposed] beyond the two-year initial ATOC operation.

Commission review of any modifications and/or changed circumstances regarding the project is governed by Section 307(c)(3)(A) and (d) of the Coastal Zone Management Act (16 U.S.C. Sections 1456(c)(3)(A) and (d)), and the accompanying federal consistency regulations (15 CFR Part 930). Section 930.66(b) of these regulations provides:

> The State agency shall request that the Federal agency take appropriate remedial action following a serious disagreement resulting from a State agency objection to a Federally licensed or permitted activity which was: (1) Previously determined to be consistent with the State's management program, but which the State agency later maintains is being conducted or is having coastal zone effects substantially different than originally proposed and, as a result, is no longer consistent with the State's management program; .... [15 CFR Part 930, Section 930.66(b) and 930.100(b)

Scripps believes the proposed modification does not affect the Commission's consistency concurrence or trigger the need for any action by the Commission. Scripps describes the modification as representing "... only a minor amendment to an activity previously reviewed by the Commission." Scripps believes the modifications would "not cause coastal zone effects substantially different than those originally reviewed by the [Commission]." While it does require an amendment to Scripps' NMFS-issued Scientific Research Permit, Scripps believes this modification does <u>not</u> qualify as a:

> Major amendments of Federal license and permit activities previously reviewed by the State agency which will cause coastal zone effects substantially different than those originally reviewed by the State agency.

Scripps cites Section 930.51(b)(3), as opposed to Section 930.66(b) of the federal consistency regulations, as an applicable regulation governing whether additional consistency review is triggered. Section 930.51(b)(3)) refers to major amendments to federal permits that would normally trigger the need for additional consistency review. However, regardless of whether the modifications are reviewed under Section 930.51(b)(3) or Section 930.66, the standard is the same: additional federal consistency review is triggered when a project: "... is being conducted or is having coastal zone effects substantially different than originally proposed and, as a result, is no longer consistent with the State's management program."

Issues Raised

One of the key project features that contributed to the Commission's concurrence with Scripps' original consistency certification was the inclusion of the following commitment:

> Scripps has now modified the MMRP such that the Pilot Study has been extended for the full length of the project, during which the MMRP research group would maintain control over the sound source for the entire 2 year period. In addition, Scripps has agreed to expand the scope of the MMRP advisory board.

Based on this revision the project was refocused from being primarily an oceanographic research program, and only secondarily a marine mammal research program, to marine mammal research being given the primary focus. These and other modifications, which were included in the final project as concurred with by the Commission, are described in Exhibit 6.

Scripps is in the process of preparing a supplemental environmental analysis under NEPA/CEQA (which would include an alternatives analysis). Scripps anticipates "this analysis will conclude that no new or substantially increased environmental impacts will result" and that the Pioneer Seamount location would provide "the most useful information for marine mammal and climate research purposes."

Nevertheless, concerns have been raised by the proposed modifications, among them:

(1) The lower 25 Hz frequency is expected to potentially affect blue and finback whales to a greater degree than the normal, 75 Hz frequency. This lower frequency is closer than the 75 Hz frequency to the dominant frequency range at which blue whales vocalize.

(2) The sound transmission at two different frequencies has the potential to affect greater numbers of marine mammals than would transmission at a single frequency.

(3) The modifications may threaten the integrity of the normal ATOC/MMRP monitoring effort, by cutting into the time needed for that research and lessening its statistical validity.

(4) The modifications are oceanographically-based rather than biologically-based, which would appear to be inconsistent with the commitments made by Scripps to maintain the project as a biologically-based monitoring effort; for example:

(a) the proposed two-week test is too short a time to generate useful information about effects on marine mammals from transmissions at the modified frequency; and

(b) early to mid-June is not a time period likely to generate much information regarding blue whale responses, given anticipated population densities in mid-June.

In light of these concerns, on February 22, 1996, the Commission staff requested responses to the following questions from Scripps regarding the proposed modifications:

1. When do you anticipate your NEPA/CEQA documentation will be available?

2. What is the anticipated time frame for a response to the proposal by the MMRP Advisory Board?

3. At what depth will the suspended source be transmitting at?

4. There are a number of inconsistencies in the information and schedule presented. Please explain exactly what is meant by an 8% duty cycle. How many minutes would the signal be on at one time: 20 minutes or 40 minutes? Why do you describe the project as a 12-day test? Two 4 day periods with a 2 day control period in between comes to 10 days. Are you adding 1 day at either end to come up with a 12 day total? Your schedule (Research Protocol, p. 3) indicates that, from start to finish, the project is a 40+ day test. Please clarify.

5. The normal ATOC/MMRP was initially estimated to take place over an 18-24 month period. It is our understanding this period has been reduced to approximately 10 months, due to funding shortages. Is this understanding accurate? How does this reduction to 10 months affect the project with regard to obtaining a statistically valid sample of responses from marine mammals?

6. How will the reduction of a more than 40 day period from the normal ATOC/MMRP monitoring further affect its statistical validity?

7. Would Scripps agree to extend the normal MMRP/ATOC study the 40 or more days being lost to this alternative study, so that no statistical validity will be threatened? If not why not?

8. How will the schedule be changed in the event of bad weather? How far can the schedule slip due to weather problems before it would be cancelled?

9. Page 1 of the proposed Research Protocol [Exhibit 3] states:

> The MMRP Director ... will ensure that the total number of ATOC source replicates and aerial surveys during the course of the MMRP will not be significantly changed with the inclusion of the alternate source period.

What does the phrase "will not be significantly changed" in that sentence mean? What <u>would</u> you consider a statistically significant change?

10. What is the statistical validity of monitoring a 12 day period of marine mammal responses to a sound source at the newly proposed frequency? How could any conclusions be generated based on such a short time period that could be relied upon for any biological conclusions, and how would the 12 day, 25 Hz effort be compared statistically with the 10 month, 75 Hz effort?

11. What are the relative populations of blue whales in the greater project region for the months of June - December? Why is the alternative source not being proposed during a time period where there would be greater populations of blue whales in the vicinity, assuming for the purposes of discussion that a 12 day monitoring effort could provide any meaningful biological information?

12. What is the expected impact on blue whales, fin whales, and any other potentially affected marine resource from modifying the proposal from a single frequency source to a dual frequency source? If the project is supposed to achieve a potential benefit of ultimately evolving to a lower frequency source (and hopefully utilizing a lesser intensity or reduced duty cycle), then why is Scripps not proposing simply to transmit a single frequency 25 Hz sound, rather than the proposed 25 Hz and 75 Hz sound? Isn't it reasonable to assume that the impact from such a dual source should be considered double, or certainly greater, than that of a single frequency sound, because a greater number of animals would be potentially affected?

13. Why did your initial EIS consider boat based sound transmissions to be infeasible, but you are now proposing to use them? Wasn't ship noise a complicating factor? How statistically will ship noise be factored out of any marine mammal response?

The Commission staff also stated to Scripps in this February 22 letter:

> Once we receive your responses we will inform you as to whether we agree with your conclusion regarding the effects of the modifications, and, therefore, whether or not additional consistency review will be necessary. Also, please be advised that, given the significant Commission interest in this project, we have scheduled an Executive Director report (which will not be accompanied by an opportunity for public comment) at our March 13, 1996, [now March 15, 1996], Commission meeting in Santa Barbara, to inform the Commission of your proposed modifications and your conclusions regarding their effects.

The Commission staff recently received Scripps' response to its letter. This response is attached as Exhibit 7. As of the date of this mailing, the staff has not had adequate time to review this response.

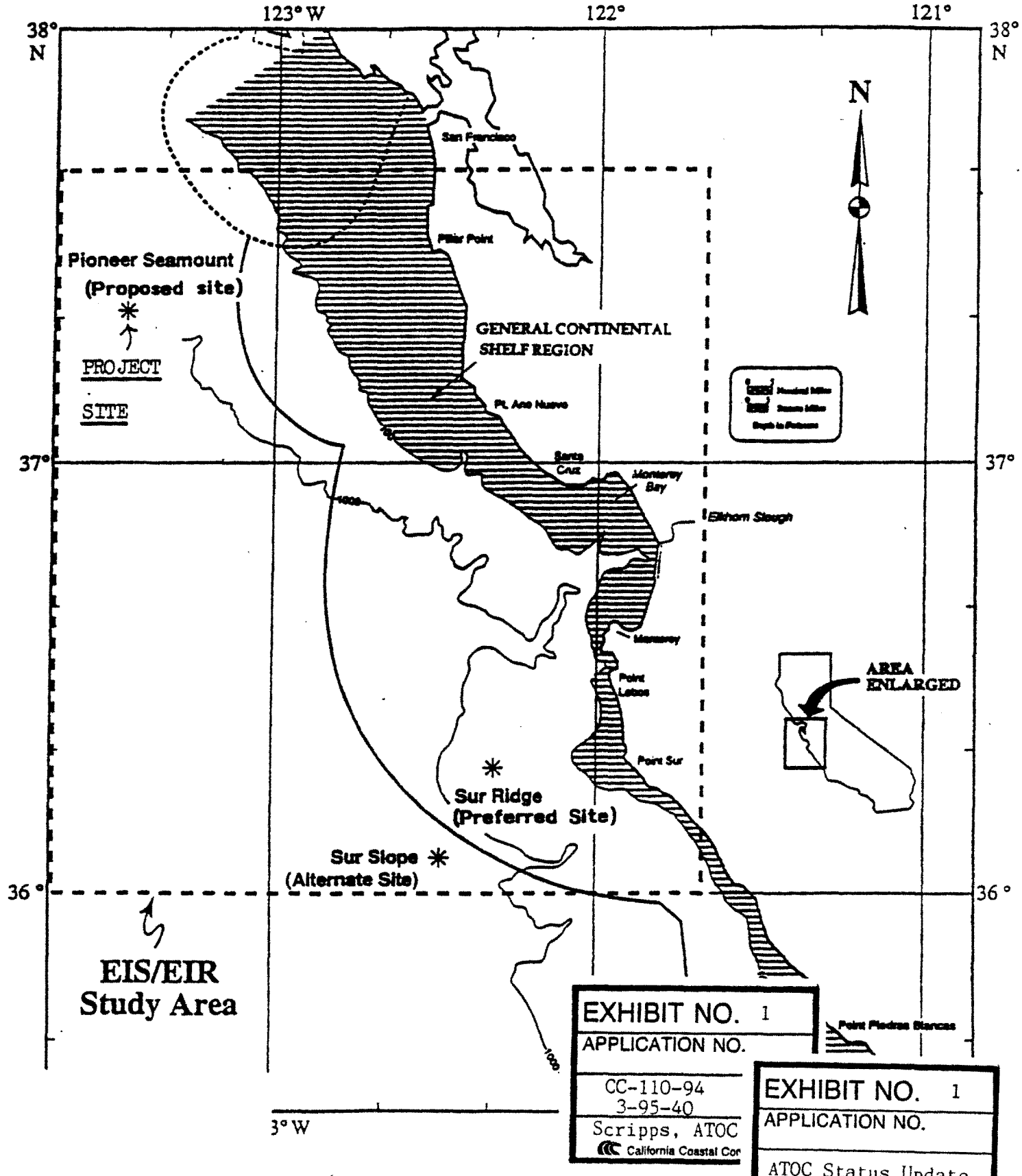

Figure 1.1.6-2 General EIS/EIR study area and ATOC preferre

EXHIBIT NO. 1
APPLICATION NO.
CC-110-94
3-95-40
Scripps, ATOC
California Coastal Cor

EXHIBIT NO. 1
APPLICATION NO.
ATOC Status Update
California Coastal Commission

EXHIBIT NO. 2
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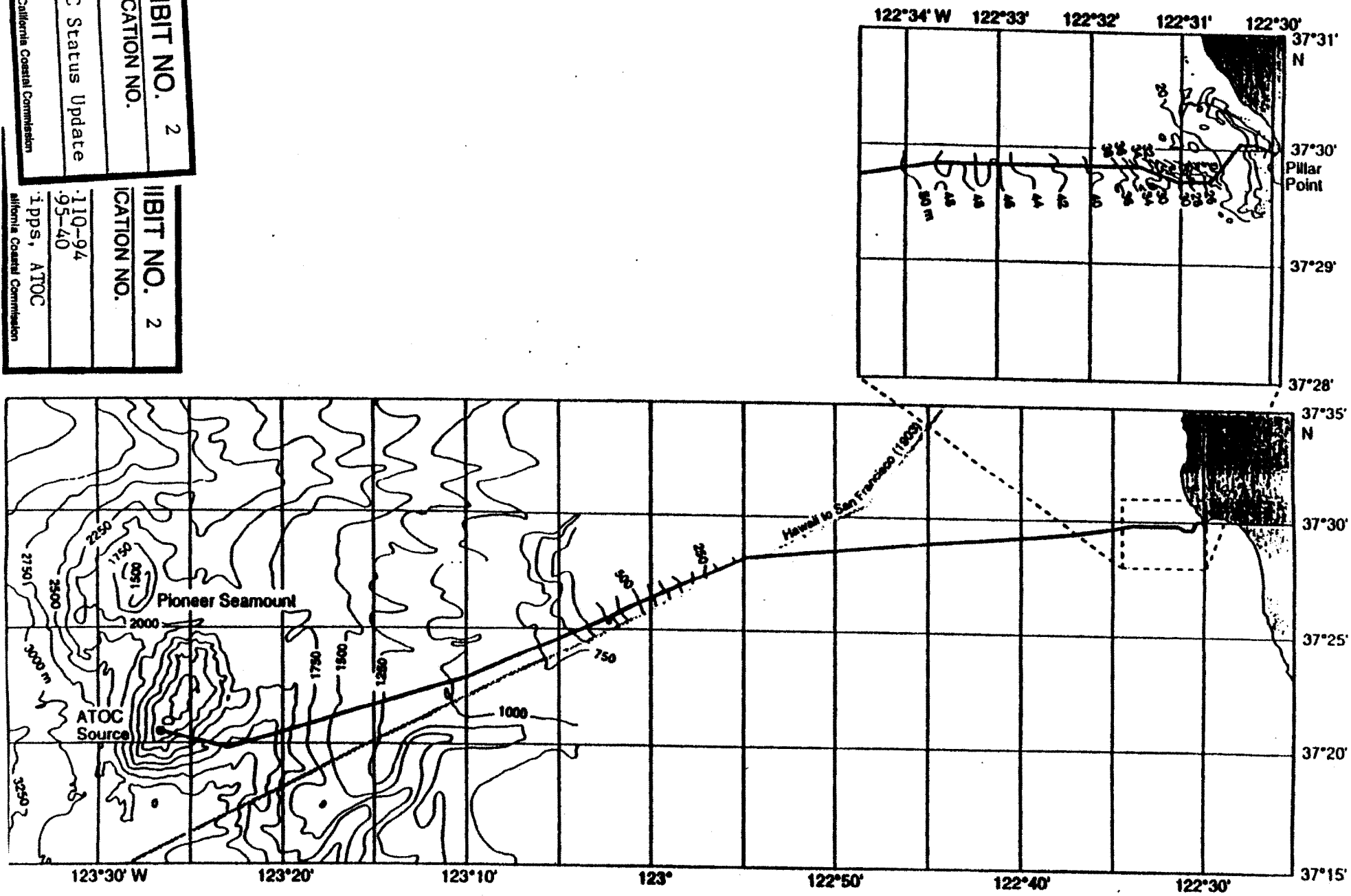

Figure 1.1.6-4 Proposed Pillar Point cable route.

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SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA, CALIFORNIA 92093

February 6, 1996

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Tami Grove
Central California District Director
California Coastal Commission
725 Front Street, Suite 300
Santa Cruz, CA 95060

Re: Acoustic Thermometry of Ocean Climate Project and Marine Mammal Research Program -- Minor Project Revision

Dear Mr. Douglas and Ms. Grove:

I am the current principal investigator of the Acoustic Thermometry of Ocean Climate (ATOC) Project of the University of California, San Diego, Scripps Institution of Oceanography (Scripps). As you know, the Coastal Commission on June 15, 1995, found the proposed ATOC project and associated Marine Mammal Research Program (MMRP) to be consistent with the California Coastal Management Program (CCMP). The Commission's consistency concurrence was based on a consistency certification originally made by Scripps on November 29, 1994, with regard to the then-proposed Sur Ridge source site, as modified on March 16, 1995, to reflect a proposed site change to Pioneer Seamount, as further modified on June 2, 1995, to reflect the terms of a settlement agreement between Scripps and a number of environmental organizations, and again as modified to incorporate mitigation commitments made by Scripps at the June 15, 1995, Commission hearing.

EXHIBIT NO. 3
APPLICATION NO.
ATOC status Update
California Coastal Commission

This letter is written to inform you of a minor modification to the activity proposed for early June, 1996. During a 12-day period, Scripps proposes to suspend operations of the fixed ATOC sound source and instead undertake an alternate source test using a ship-suspended sound source approximately 10 nautical miles southwest of Pioneer Seamount. The alternate test source will have the same total power output as the current fixed source (195 dB) but divided between two frequency bands at 25 Hz and 75 Hz. The purpose of testing the alternate source, generally, is to test the propagation characteristics at the alternate source frequency and to evaluate potential impacts of the dual frequency sound source on marine mammals in the Pioneer Seamount vicinity. This is described in greater detail in the attached "Research Protocol for the California MMRP of the ATOC Experiment, Executive Summary of Proposed Modification No. 3 to NMFS Scientific Research Permit No. 968 (8 February 1996)".

We do not believe that this minor modification of the proposed activity affects the Commission's consistency concurrence or requires action by the Commission, since it represents only a minor amendment to an activity previously reviewed by the Commission. 15 C.F.R. § 930.51(b)(3). As you know, Scripps' original consistency certification was submitted with a reservation of objections based on the threshold criteria for consistency review. In response to the Commission's request and Scripps' reservation, the Office of Ocean and Coastal Resource Management (OCRM) on January 27, 1995, provided additional written guidance concerning some of these issues, without ruling on the Commission's request. Subsequently, OCRM on March 10, 1995, granted the Commission's request to review Scripps' application for a MBNMS permit, and the Commission concurred in Scripps' consistency certification on June 15, 1995.

The alternate source test will not "cause coastal zone effects substantially different than those originally reviewed by the [Commission]." Id. Similarly, we are not aware of any CCMP amendments "not in existence at the time of original [Commission] review" that would apply to the proposed activity. 15 C.F.R. § 930.51(b)(2). The alternate sound source will have the same total power output as the fixed ATOC source (split between two frequencies), and will operate at only a slightly higher duty cycle (approximately 8% rather than 3%) for a brief, 12-day period. MMRP observations will continue under the revised protocols, and the source shutdown criteria applicable to the fixed ATOC sound source will remain in effect during the alternate source test.

A combined environmental assessment/initial study (EA/IS) under the National Environmental Policy Act and California Environmental Quality Act is being prepared, and it is anticipated that this analysis will conclude that no new or substantially increased environmental impacts will result. The EA/IS will also evaluate alternative locations. The alternate source test is currently proposed to take place near Pioneer Seamount in order to take advantage of the ATOC and MMRP facilities and activities currently located at (and in relation to) that site. This is anticipated to result in the most useful information for marine mammal and climate research purposes. The National Marine Fisheries Service has advised us that the most appropriate format for addressing the activity will be a minor modification to Scientific Research Permit No. 968; an application for that modification is currently in preparation.

At the June 15, 1995, hearing the Commission also approved a coastal development permit (CDP) for the portions of the ATOC cable located in state waters. Since the alternate source test will not use the cable permitted by the CDP, and will not affect the CDP-permitted facilities in any way, we do not believe that the CDP is affected by this proposal. Since the proposed activity will occur entirely on the high seas and outside the boundaries of national marine sanctuaries, we have concluded that no other approvals are required.

We appreciate your attention to this minor project revision. If you or your staff have any questions or would like to discuss this matter further, please contact me at (619) 534-4688, or our legal counsel, Alan Waltner, (510) 465 4494. Thank you again for your assistance.

Sincerely,

Peter Worcester
ATOC Principal Investigator

Enclosure

cc: National Marine Fisheries Service
Monterey Bay National Marine Sanctuary
Gulf of the Farallones National Marine Sanctuary
Corps of Engineers
Department of the Navy
Advanced Research Projects Agency
San Mateo County Planning Department

RESEARCH PROTOCOL FOR THE CALIFORNIA MMRP OF THE ATOC EXPERIMENT

EXECUTIVE SUMMARY OF PROPOSED MODIFICATION NO. 3
TO NMFS SCIENTIFIC RESEARCH PERMIT NO. 968
(7 February 1996)

Ref: (a) Final EIS/EIR for the California ATOC Project and its Associated MMRP dtd April 1995
(b) MAI ltr dtd 19 Jun 95 (Research Protocol for the California MMRP of the ATOC Experiment; Executive Summary of Amendments (19 June 1995))
(c) NMFS/OPR ltr dtd 13 Jul 95 (Scientific Research Permit No. 968)
(d) NMFS/OPR ltr dtd 30 Jul 95 (Scientific Research Permit No. 968 Mod. 1)
(e) NMFS/OPR ltr dtd 21 Dec 95 (Scientific Research Permit No. 968 Mod 2)

PREFACE

The proposed modification to NMFS Scientific Research Permit No. 968, provided herein, is comprised of inputs from the ATOC Program Manager, the ATOC MMRP Director, the ATOC MMRP Program Manager, and the ATOC California MMRP Principal Investigator. This executive summary is not meant to be a stand-alone document; it should be considered as a minor modification to Appendix C of reference (a), and references (b) through (e).

EXPERIMENTAL OVERVIEW

The proposed modification involves the conduct of standard, approved MMRP activities during a 12-day period in June 1996, using an alternate source deployed at approximately 700 m depth off a research vessel, located approximately 10 nm southwest of Pioneer Seamount (the ATOC source located on Pioneer Seamount will be shut down for the 12-day period). During the 12-day period, MMRP data will be collected with the alternate source transmitting with almost the same characteristics as the ATOC source, but in two frequency bands, one centered at about 75 Hz (standard ATOC frequency) and one centered at about 25 Hz. As in standard MMRP research operations, acoustic transmissions from the alternate source will be under the control of the California MMRP P.I. Maximum source level will still be 195 dB, maximum duty cycle < 8%, with a 5-minute source ramp-up period. MMRP aerial visual surveys, and vessel-based visual and acoustic monitoring will occur prior to, during, and after the 12-day period. The MMRP Director and California MMRP P.I. will ensure that the total number of ATOC source replicates and aerial surveys during the course of the MMRP will not be significantly changed, with the inclusion of the alternate source period. Blue and fin whales vocalize in the frequency band just below 25 Hz and, thus, will be the most likely candidates for exhibiting any potential effect from the alternate source transmissions. Blue whales are most prevalent in the Farallon Basin area during the June-December timeframe, and fin whales, although rarely seen in this region, have no particular seasonality.

Enclosure (1)

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The proposed modification addresses two of the alternatives considered in the EIS/EIR, one directly (Alternative 6), and one indirectly (Alternative 12):

- Alternative 6: modified source operational characteristics: although very similar to the ATOC source located on Pioneer Seamount, there are some modified characteristics:
  - Depth: 700 m, vice 1000 m.
  - Frequency/bandwidth: approximately 75 Hz (20 Hz) and 25 Hz (8-10 Hz), vice 75 Hz (20 Hz) alone.
  - Transmission Schedule: same but 2000Z transmission is 40 min vice 20 min.
  - Waveforms: 25 Hz transmissions have two options: 1) m-sequence with 9 Hz bandwidth; 2) multi-line signal with 8 Hz bandwidth, all lines equal power, 75 Hz transmissions formed from third harmonics of 25 Hz signals.

- Alternative 12: alternative MMRP techniques--mobile playback experiments: although most playback experiments use sources with much lower power levels than the ATOC source, this is an opportunity to use an alternate source with the same power levels. The research vessel to be used during the 12 day period will remain stationary (using a reliable dynamic positioning system and differential GPS), and will maintain a "quiet ship" routine throughout the 12-day period.

MMRP research protocol criteria (as per references (a) through (e)) will remain in force, except as proposed below. The transmission schedule will consist of a control period of approximately 4-7 days, 4 days of transmissions, approximately 2 control days, 4 days of transmissions, and a control period of approximately 4-7 days. Aerial surveys will occur during all replicate periods, as provided in reference (b), vessel-based visual observations, and vessel-based acoustic observations will be conducted from the alternate source deployment platform.

The primary MMRP objectives, as stated in references (a) through (e) remain valid for the alternate source transmission periods, modified by the goal of utilizing the existing MMRP capabilities (supplemented as stated below) to assess the potential for acute effects of alternate source transmissions (at 25 Hz) on marine animals, particularly marine mammals and sea turtles within the 120 dB sound field (modeled at 100 m depth). Source shut-down criteria, as stated in references (a) through (e) remain in effect during the alternate source transmission period.

The primary acoustic thermometry objectives relative to the alternate source transmissions are: 1) utilize ATOC facilities (AVLAs and SOSUS receivers) and coincidental acoustic transmission paths to help determine the appropriate frequency to use in any long-term follow-on project; 2) utilize the 25 Hz option 1 signal to test the combination of temporal and spatial resolution to separate the lowest few acoustic propagation modes for analysis; 3) utilize the 25 Hz option 2 signal to measure 3 parameters (phase and amplitude coherence across frequencies, incoherent signal power at frequencies close to the signal lines, ambient noise level between signal lines). If analysis of the data from the alternate source transmissions indicates that internal wave effects on the transmitted signals are significantly decreased at 25 Hz, future acoustic thermometry data collection efforts could occur at a lower duty cycle--reduced by as much as 50% or more. A reduction in duty cycle at this frequency could be considered potentially beneficial to marine mammals that vocalize in that band.

PROPOSED MEASUREMENTS

Reference (b) states the focus and priority of the research protocol; the following MMRP activities will be scheduled during the twelve day period:

- Standard aerial visual surveys will be conducted prior to commencement of the first 4-day continuous alternate source transmission period, during the first transmission period, during the following control period, during the second alternate source transmission period, and during the following control period.

- Standard shipboard visual observations will be made from the alternate source deployment vessel, during daylight hours prior to, during and after alternate source transmissions.

- A vertical line array (VLA) will be deployed from the alternate source vessel, to monitor marine mammal vocalizations before, during, and after transmissions.

PROCEDURES AND RESEARCH TECHNIQUES

Reference (b) amendments to the original research protocol apply, with the following exceptions:

- Start-up protocol: Visual observers on the alternate source deployment vessel will conduct behavioral observations before, during and after the first day of transmissions (at maximum 195 dB source level). Two criteria must be met in order to commence the alternate source transmissions: 1) a control aerial survey must have been conducted during the previous 4- 7 days, and 2) weather on first day of transmissions must be conducive to visual and acoustic monitoring from the alternate source deployment vessel.

- Total transmission time will average less than 8%.

- The following schedule is proposed (dates approximate):

20 May-5 Jun 96:	Aerial visual control survey.
6-9 Jun 96:	Alternate source transmission period #1. Standard MMRP aerial visual experiment survey. Shipboard visual and VLA acoustic observations from alternate source deployment vessel.
10-11 Jun 96:	Aerial visual control survey. Shipboard visual and VLA acoustic observations from alternate source deployment vessel.
12-15 Jun 96:	Alternate source transmission period #2. Standard MMRP aerial visual experiment survey. Shipboard visual and VLA acoustic observations from alternate source deployment vessel.
16 Jun-1 Jul 96:	Aerial visual control survey.

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- The VLA will be in use 24 hrs/day during the 12-day period, including during alternate source transmissions, for near-continuous monitoring of marine mammal vocalizations and ambient sound levels.

ENVIRONMENTAL COMPLIANCE

- A joint NEPA/CEQA Environmental Assessment (EA)/Initial Study is being prepared.
- The need for a consistency certification is being explored with the California Coastal Commission.
- A request for modification to Scientific Research Permit No. 968 is being reviewed by the MMRP Advisory Board and will be submitted to NMFS.

REPORTS

- Preliminary results of MMRP activities during the alternate source transmissions will be included in the subsequent bi-monthly report. More details will be available in the quicklook report, and analysis results provided in the final report.

SUBMITTED BY:

Christopher W. Clark, Ph.D.
ATOC MMRP Director

Daniel P. Costa, Ph.D.
ATOC California MMRP P.I.

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EXECUTIVE SUMMARY

Scripps Institution of Oceanography (Scripps) proposes the Acoustic Thermometry of Ocean Climate (ATOC) project, consisting of placing a sound-emitting device at Pioneer Seamount, 48 nautical miles offshore of Half Moon Bay, connected with a power cable to shore at the Pillar Point Air Force Tracking Station. The project goal is studying global warming by measuring the speed of sound transmitted through an underwater channel. The sound source will be 980 meters deep and will emit high intensity (195 dB), low frequency sounds. The sound transmissions would last for 20 minutes every 4 hours, on four out of 11 days, which equates to a duty cycle of 3% (i.e., the source will silent 97% of the time).

Because a number of species of marine animals hear and communicate at low frequencies, concerns have been raised over whether or not project would cause adverse effects on marine resources, such as sperm whales, sea turtles, and elephant seals. Very little is known about the effects of low frequency sound on marine animals, particularly marine mammals and sea turtles. Scripps has included within the project a Marine Mammal Research Program (MMRP), which will monitor the biological effects of the sound transmissions. The MMRP monitoring studies would continue throughout all ATOC transmissions.

In addition to the monitoring Scripps has agreed: (1) to use a "ramp up period" during which the sound will be turned up gradually, rather than starting at "full blast;" (2) to operate ATOC at "the minimum duty cycle necessary to support MMRP objectives and ATOC feasibility objectives;" (3) to cease the ATOC project in the event significant adverse impacts are occurring; (4) to allow the MMRP research group to maintain control over the sound source for the entire 2 year period; (5) to expand the scope of the independent MMRP advisory board; (6) to remove the sound source as soon as is feasible after the 2 year project; (7) that project authorization at this time is not a commitment to use of this location (Pioneer Seamount) for future ATOC studies; (8) to prepare a Programmatic EIS/R prior to any long term ATOC activities; (9) that an essential siting criterion for a long term site will be: Location in an area with minimal abundances of marine life that might possibly be adversely affected by low frequency sound; and (10) to include a fisheries biologist on the MMRP advisory board and include monitoring of impacts on fish behavior.

Given the potential scientific and environmental benefits from the research proposed, and since the only way to determine the project's impacts is to allow it to proceed in the short term and study its impacts, the authorization of a two year initial ATOC project is warranted. This conclusion is dependent on the combination of the monitoring and protective measures incorporated into the project, the relatively short (two-year) duration of the project, and the relocation of the ATOC sound source outside the Monterey Bay National Marine Sanctuary. This conclusion is also based on the future involvement of the Commission in reviewing the results of the MMRP, in consultation with NMFS, MMC, and other reviewers. Such review may lead to modifications and/or cessation of the project, depending on the results of the monitoring. Finally, additional federal consistency review by the Commission will be triggered in the event that: (1) Scripps makes any significant modifications to either (a) the MMRP or other mitigation measures or (b) the ATOC project itself; (2) any evidence materializes documenting adverse effects on marine resources "substantially different" than those originally proposed (see Exhibit 21, Section 930.66 of federal consistency regulations); or (3) any extension beyond the two-year initial ATOC operation.

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SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA, CALIFORNIA 92093

November 30, 1995

Dr. William Fox
Director, Office of Protected Resources
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, MD 20910

Dear Dr. Fox,

In response to the ATOC MMRP Advisory Board's Statement dated 11.30.95, the ATOC Program accepts the Board's recommendations contained in points (2d), (2e), (2h) and (3a-d), and agrees with the MMRP's actions identified by the MMRP Program Manager in his letter to you of 11.30.95.

The ATOC Program reaffirms, as suggested in point (3e), that written statements regarding marine mammals will not be released without MMRP review and concurrence.

Sincerely,

Andrew Forbes
ATOC Program Manager

cc: Hilda Diaz-Soltero
Chris Clark
Dan Costa
Clay Spikes

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COASTAL COMMISSION

EXHIBIT NO. 5
APPLICATION NO.
ATOC Status Update
California Coastal Commission

MARINE ACOUSTICS, INC.

Four Crystal Park, Suite 901
2345 Crystal Drive
Arlington, VA 22202
(703) 418-1888
FAX 418-1042

30 November 1995

Dr. William Fox
Director, Office of Protected Resources
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, MD 20910

Re: LGL, Ltd. ltr dtd 30 Nov 95 (ATOC Marine Mammal Research Program Advisory Board Statement, 30 November 1995)

Dear Dr. Fox:

In response to the referenced letter, the ATOC Marine Mammal Research Program accepts the recommendations specified therein; that being: "...upon authorization by NMFS to initiate transmissions as quickly as possible under the provisions of the previously-agreed California MMRP research protocol, modified by points (2d), (2e), (2h) and (3a-3d)."

The following identifies MMRP actions to comply with the above:

2d. The first four sets of transmissions are scheduled to begin at or about 1200L.

2e. All transmissions will be ramped up over a 5-minute period.

2h. The California MMRP Principal Investigator, Dr. D. P. Costa, has intiated action with NMFS-SWR to develop a more specific plan for rapid response to any future strandings or deaths of large whales or elephant seals, or mass strandings of small cetaceans, that might occur near the study area during the study period.

3a. All future acoustic transmissions from the ATOC source(s), including any future engineering test transmissions, will be under the control of, or with full knowledge and documented advance concurrence of, the MMRP. This is ensured by a modification to the SRP by NMFS that reiterates the aforementioned, the written assurance from Scripps Institution of Oceanography (ATOC Program Manager), and the fact that the MMRP plans to monitor transmission times and levels via independent continuous logging of the power output from the Pillar Point station down the sea cable to the source on Pioneer Seamount (see 3c below).

3b. The agreed-upon California MMRP research protocols will be implemented during all acoustic transmissions by the ATOC source(s), and the source level (overall) will not exceed 195 dB re 1μPa-m at any time. This will be regulated via continuous Pillar Point station monitoring (see 3c below).

EX 5P 2

30 November 1995

Dr. William Fox
Director, Office of Protected Resources
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, MD 20910

Re: LGL, Ltd. ltr dtd 30 Nov 95 (ATOC Marine Mammal Research Program Advisory Board Statement, 30 November 1995)

3c. The MMRP plans to collect and continuously log data at the Pillar Point station in order to maintain an independent MMRP record of the times and source levels of all acoustic transmissions by the ATOC source at the Pioneer Seamount site. These data will be reviewed by MMRP Research Team personnel and will be available to the Advisory Board and other interested groups on request to the MMRP Director.

3d. The past and planned transmission schedule is available to the public, and updates will be made whenever changes or refinements occur. The first update is being transmitted this date by the California MMRP P.I. to all Advisory Board members and interested parties, and will be passed to the public via the public affairs offices at NMFS, Scripps and UCSC. In accordance with MMRP Research Protocol endorsed by the Advisory Board, planned transmission schedules are subject to change at the discretion of the DA.

The Advisory Board will be notified promptly about any future deviations from the agreed-upon California research protocol or potentially significant problems. This action is the responsibility of the MMRP Director or, in his absence, the MMRP P.M.

A specific schedule for issuing planned bimonthly reports will be established and promulgated to all Advisory Board members and observers, interested parties, and the public via aforementioned vehicles. Bimonthly Report #1 is scheduled for 30 days after the commencement of MMRP acoustic transmissions. If transmissions start on 30 November 1995, Bimonthly Report #1 will be available on 30 December 1995.

Plans are for an Advisory Board meeting to occur by 31 March 1996.

Please contact the undersigned if you have any questions or comments, or require amplifying information on any of the above.

EX 503

30 November 1995

Dr. William Fox
Director, Office of Protected Resources
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, MD 20910

Re: LGL, Ltd. ltr dtd 30 Nov 95 (ATOC Marine Mammal Research Program Advisory Board Statement, 30 November 1995)

Sincerely,

C. H. Spikes

Clayton H. Spikes
ATOC MMRP Program Manager

cc:
Scripps (A. Forbes)
NMFS-SWR (H. Diaz-Soltero)
Cornell (C. Clark)
UCSC (D. Costa)
ARPA (A. Cheaure)
LGL, Ltd. (W. J. Richardson)

EX. 8 P. 4

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

Th 4a
Th 5a

TO: Commissioners and Interested Parties

FROM: Peter Douglas, Executive Director

DATE: June 5, 1995

SUBJECT: **Scripps/ATOC** ADDENDUM TO REVISED STAFF REPORT AND RECOMMENDATION ON COMBINED CONSISTENCY CERTIFICATION AND COASTAL DEVELOPMENT PERMIT APPLICATION FOR CC-110-94/3-95-40

I. Background. On June 2, 1995, the Commission staff recomendation was mailed to the Commissioners and interested parties. On June 5, 1995, the Commission staff received the attached letter containing project modifications, based on an agreement between Scripps Institution of Oceanography and representatives of a number of environmental organizations. The major points of this agreement modify the project in a number of ways; the following is a brief summary of these modifications:

1. The MMRP Pilot study, initially a 6 month study, will be extended for the full 2 year period. The MMRP research group will maintain control over the sound source for the entire 2 year period.

2. The scope of the independent MMRP advisory board is expanded, and greater public dissemination of the advisory board discussions will occur. The environmental organizations will be represented by two new members on the advisory board.

3. Project authorization at this time is not a commitment to use of this location (Pioneer Seamount) for future ATOC studies. The sound source will be removed as soon as is feasible after the 2 year project, and Scripps will not reuse the source "until such removal has occurred, except with the consent of the environmental organizations as a group."

4. A Programmatic EIS/R will be prepared prior to any long term ATOC activities. An essential siting criterion for a long term site will be: "Location in an area with minimal abundances of marine life (including but not limited to marine mammals) that might possibly be adversely affected by low frequency sound." In addition, Scripps expresses its understanding that "the MMRP does not claim that it will be able to prove or disprove long-term impacts on marine mammals [from a 2 year study], and therefore the results of the MMRP will not be so used."

II. Staff Recommendation. The staff originally recommended that the Commission concur with the ATOC/MMRP project, for the reasons explained in the staff report mailed for the June 1995 Commission meeting. The above modifications do not alter the staff's recommendation that the Commission concur with the consistency certification for the project as now described. Any further modification to the above commitments and the commitments already reflected in the existing staff recommendation may trigger the need for additional Commission authorization.

Attachment

EXHIBIT NO. 6
APPLICATION NO.
ATOC status Update

LAW OFFICES OF
ALAN C. WALTNER
1736 FRANKLIN STREET, EIGHTH FLOOR
OAKLAND, CALIFORNIA 94612

TELEPHONE
(510) 465-4404
(510) 208-4562 (DIRECT)

FACSIMILE
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(510) 208-4558

June 5, 1995

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CALIFORNIA
COASTAL COMMISSION

Peter Douglas
Executive Director
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

Tami Grove
Central California District Director
California Coastal Commission
725 Front Street, Suite 300
Santa Cruz, CA 95060

Re: ATOC Project Federal Consistency Review

Dear Mr. Douglas and Ms. Grove:

As you know, at the May hearing regarding the consistency review and coastal development permit for the Acoustic Thermometry of Ocean Climate Project ("ATOC") and associated Marine Mammal Research Program ("MMRP"), it was reported that the applicant, Scripps Institution of Oceanography ("Scripps") had undertaken discussions with a number of concerned environmental organizations in an attempt to resolve outstanding differences regarding these pending applications.

We are pleased to inform you that those discussions have been successful, resulting in the attached agreement. Please note that under the agreement Scripps will be requesting that the National Marine Fisheries Service ("NMFS") include as conditions in the pending Scientific Research Permit ("SRP") the following two mitigation measures:

- The MMRP Pilot Study will be extended through the entire initial research period of approximately 18 to 24 months, in lieu of the ATOC feasibility phase in the current proposal. As a result, the MMRP will retain control of the sound source (including determination of duty cycle and decisions regarding operation, suspension and termination) through the entire 18 to 24 month initial research period, and no transfer of control or shift to a climate research transmission schedule will occur during that period. The transmission schedule for the extended Pilot Study will

preliminarily be the same four day on, seven day off protocol as for the original Pilot Study, subject to review and potential mid-course corrections approximately six months into the Pilot Study, under the procedures currently contemplated for the "quick look" report. The objective of the quick look report will be solely to review the progress of the MMRP to that date, and no attempt will be made to come to final conclusions regarding the potential effects of ATOC source transmissions on marine mammals, except as required by the guidelines for shut-down of the sound source.

- o The MMRP will invite two members and two observers to the MMRP Advisory Board, from individuals nominated by the environmental organizations. Minutes of the Advisory Board meetings and a summary of those meetings will be made available to the public, and the summary will be distributed to a mailing list to be developed. The Advisory Board shall be provided full and prompt access to all MMRP documents and data (except documents such as personnel records that may be protected by law from disclosure), and the MMRP shall provide a prompt response to all Advisory Board comments regarding the MMRP. Regular reports shall be provided by the MMRP to the Advisory Board including, at minimum, bi-monthly Pilot Study Status Reports and the Final Pilot Study Report. The parties understand that NMFS will maintain continuing oversight over the MMRP, and any disputes between the MMRP and the Advisory Board will be reported to NMFS for appropriate disposition. In the event of disagreement between the MMRP and the Advisory Board, the MMRP agrees, pending disposition by NMFS, to defer to the Advisory Board.

In addition, under the agreement other mitigation measures that will apply beyond the time-frame of the SRP will be submitted to the Chancellor of the University of California at San Diego to be included as additional mitigation measures and conditions of approval.

Scripps therefore requests that the consistency certification be considered on the basis of the project with the additional features provided for in the agreement.

Sincerely,

Alan Waltner

SETTLEMENT AGREEMENT AND RELEASE

1. This agreement ("the agreement") is made and entered into effective June 2, 1995, by and between the Natural Resources Defense Council, Environmental Defense Fund, Earth Island Institute, Humane Society of the United States, League for Coastal Protection, and American Oceans Campaign ("environmental organizations") and the University of California, including the Acoustic Thermometry of Ocean Climate Project ("ATOC") of the Scripps Institution of Oceanography ("Scripps") (collectively referred to as "the University"), regarding the ATOC project and associated Marine Mammal Research Program ("MMRP"), and shall be binding upon and inure to the benefit of the environmental organizations and the University, and their respective successors, assigns, predecessors, subsidiaries, affiliates, officers, directors, attorneys and shareholders, partners and limited partners, to the extent permitted by law. The parties to this agreement hereby agree as follows:

2. The MMRP Pilot Study will be extended through the entire initial research period of approximately 18 to 24 months, in lieu of the ATOC feasibility phase in the current proposal. As a result, the MMRP will retain control of the sound source (including determination of duty cycle and decisions regarding operation, suspension and termination) through the entire 18 to 24 month initial research period, and no transfer of control or shift to a climate research transmission schedule will occur during that period. The transmission schedule for the extended Pilot Study will preliminarily be the same four day on, seven day off protocol as for the original Pilot Study, subject to review and potential mid-course corrections approximately six months into the Pilot Study, under the procedures currently contemplated for the "quick look" report. The objective of the quick look report will be solely to review the progress of the MMRP to that date, and no attempt will be made to come to final conclusions regarding the potential effects of ATOC source transmissions on marine mammals, except as required by the guidelines for shut-down of the sound source.

3. The installation of the cable to the Pioneer Seamount site will not be considered as a siting criterion or factor pertaining to the location of any long-term ATOC operational sound source offshore California. ATOC further agrees to remove the sound source as soon as feasible after the end of the initial 18 to 24 month research phase, and will not reuse the source until such removal has occurred, except with the consent of the environmental organizations as a group.

4. In the event that ATOC proposes to install and/or operate a long-term sound source, a full environmental review process will be undertaken in compliance with all applicable laws, including the preparation, circulation and approval of a programmatic environmental impact statement under NEPA (and equivalent document for affected states that have corresponding

state law requirements) on any significant impacts of all components of the project, including any source locations contemplated at that time for the full duration of the anticipated project; provided, however, that to the extent the decision to prepare such a document is beyond the control of ATOC, ATOC agrees to request that the federal or state lead agency undertake such preparation. Such programmatic document will contain an analysis of all reasonable alternatives that could feasibly meet project objectives. ATOC further agrees to seek additional appropriate permits from NMFS.

5. In selecting the proposed site for future long-term operational ATOC sound sources that are not to be associated with MMRP activities, none of the siting criteria applicable to the MMRP set forth in the California ATOC/MMRP EIS will be applied, and the following will be included as an essential siting criterion for the ATOC operational phase: "Location in an area with minimal abundances of marine life (including but not limited to marine mammals) that might possibly be adversely affected by low frequency sound." The goal of this siting criterion shall be to minimize impacts on the marine environment, recognizing that in cases where no or insufficient data exist adverse effects will be presumed for siting purposes, and further recognizing the need to provide adequate buffer zones around areas of significant marine life resources.

6. The MMRP will invite two members and two observers to the MMRP Advisory Board, from individuals nominated by the environmental organizations. Minutes of the Advisory Board meetings and a summary of those meetings will be made available to the public, and the summary will be distributed to a mailing list to be developed. The Advisory Board shall be provided full and prompt access to all MMRP documents and data (except documents such as personnel records that may be protected by law from disclosure), and the MMRP shall provide a prompt response to all Advisory Board comments regarding the MMRP. Regular reports shall be provided by the MMRP to the Advisory Board including, at minimum, bi-monthly Pilot Study Status Reports and the Final Pilot Study Report. The parties understand that NMFS will maintain continuing oversight over the MMRP, and any disputes between the MMRP and the Advisory Board will be reported to NMFS for appropriate disposition. In the event of disagreement between the MMRP and the Advisory Board, the MMRP agrees, pending disposition by NMFS, to defer to the Advisory Board.

7. As to those commitments that pertain to the MMRP (items 2 and 6 above), ATOC and the MMRP will request that they be included as permit conditions in the Scientific Research Permit ("SRP") under consideration by the National Marine Fisheries Service ("NMFS"). ATOC and the MMRP also will request the UCSD

Chancellor to include all of the terms above as additional mitigation measures and supplemental conditions of approval. The agreement shall terminate, and shall be void and of no effect as to all of the parties, in the event that these terms are not included in the SRP and UCSD Chancellor's approval as so provided.

8. The environmental organizations agree not to challenge any of the permits or other approvals for the initial 18 to 24 month experimental period pertaining to ATOC and the MMRP, including the certification/adoption of the Final Environmental Impact Statement/Environmental Impact Report for the California Acoustic Thermometry of Ocean Climate Project and its associated Marine Mammal Research Program ("FEIS/EIR"), and the project approvals listed at page 1-24 of the FEIS/EIR ("approvals"), and hereby waive and release any and all claims and/or causes of action relating thereto. The environmental organizations agree not to commence any legal action challenging these proceedings or permits, and further agree not to oppose these applications or permits in applicable administrative proceedings. The environmental organizations may provide comments in these administrative proceedings, but such comments shall be limited to: (a) issues presented by specific proposed permit language and final revisions to the MMRP and ATOC projects not yet reduced to writing and provided to the environmental organizations, and (b) contingent comments necessary to exhaust administrative remedies in the event that the agreement terminates. Any such comments shall also state the environmental organizations' agreement not to oppose the subject approvals provided that all of the mitigation measures proposed in the FEIS/EIR and adopted by UCSD Chancellor remain in effect and provided further that all of the terms and conditions of the agreement become and remain effective.

Notwithstanding the foregoing, the environmental organizations reserve the right to challenge any violations of permits issued for ATOC and/or the MMRP, and/or violations of the agreement. The environmental organizations further reserve the right to challenge future permits or environmental documents for activities beyond the initial 18 to 24 month experimental period, and by this agreement the environmental organizations do not endorse any long-term ATOC program. The University reserves any and all defenses to such challenges. Furthermore, the agreement by the environmental organizations not to oppose the MMRP shall not be taken as concurrence or agreement in any results of the MMRP.

9. The MMRP recognizes the limitations of any scientific research attempting to prove long-term impacts on marine animal populations and the difficulties of conclusively associating such

impacts with a specific cause. The MMRP recognizes that the predicted statistical power of aerial and boat based survey efforts proposed for the area is predicted to be limited and may, depending upon actual sighting numbers, only resolve large (as compared to slight or subtle) response differences. Other observational platforms, including acoustic observations and tagging, are designed to be capable of resolving relatively slight or subtle short-term responses in individual animals. For these reasons, and given the fact that the proposed research in the Pioneer Seamount study area is limited to less than two years, the MMRP does not claim that it will be able to prove or disprove long-term impacts on marine mammals, and therefore the results of the MMRP will not be so used.

10. The environmental organizations agree that none of the changes provided by the agreement requires delaying any of the applicable permit proceedings.

11. In any public statements regarding the agreement, it will be stated that all parties have worked diligently to resolve disagreements about the MMRP, resulting in an agreement by the environmental organizations not to oppose the MMRP during the initial 18 to 24 month research phase.

12. The agreement shall constitute the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior negotiations and agreement, whether written or oral. This is an integrated agreement.

13. The agreement shall be governed by the laws of the State of California and, except as provided above, shall be modified only by further written agreement among the signatories thereto.

14. The parties acknowledge that they are each represented by competent and independently selected counsel, and that they have each read the agreement and have had the agreement explained to them by their counsel. The parties further acknowledge that the agreement has been drafted in a cooperative and joint effort of all of the parties and that none of the language herein shall be deemed to have been drafted by any particular party.

15. The agreement (with the exception of paragraph 5) shall only apply to the proposed ATOC California sound source and associated MMRP and will have no effect on the pending proposals by ATOC and the MMRP regarding activities in Hawaii, unless a new offer is made by the University and accepted by a sufficient number and composition of Hawaii organizations to be identified in any such offer.

16. Each of the undersigned represents and warrants that he or she has the power and authority to enter into the agreement and to bind legally the party or parties on whose behalf he or she is signing.

17. This agreement may be executed by the parties either by an authorized representative or by and through their counsel, and may be signed in counterparts. Signatures transmitted by facsimile shall be deemed to have the same force and effect as original signatures. This agreement shall become effective if and only if the signatures for all of the undersigned parties (with the exception of the League for Coastal Protection) are received at the offices of the undersigned counsel for the University on or before 6:00 p.m. Pacific Time, June 2, 1995.

Date: 6/2, 1995 LAW OFFICES OF ALAN WALTNER

By: ______________________
Alan C. Waltner
Attorneys for the University of California, including the Scripps Institution of Oceanography and Acoustic Thermometry of Ocean Climate Project

Date: ________, 1995 SIERRA CLUB LEGAL DEFENSE FUND

By: ______________________
Michael R. Sherwood
Attorneys for Humane Society of the United States and American Oceans Campaign

Date: ________, 1995 HELLER, EHRMAN, WHITE & MCAULIFFE

By: ______________________
Nicole J. Walthall
Attorneys for Earth Island Institute

[Signatures on separate pages]

Date: 6/2, 1995 ENVIRONMENTAL DEFENSE FUND

By: Rod Fujita
Rod Fujita

Date: _____, 1995 LEAGUE FOR COASTAL PROTECTION

By: _____

Date: _____, 1995 NATURAL RESOURCES DEFENSE COUNCIL

By: _____
Joel Reynolds

Ex 6 p 9

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

TO: Scripps
Zeke Grader, PCFFA
Pietro Parravano, HMBFMA
ATOC File CC-110-94

FROM: Mark Delaplaine, Federal Consistency Supervisor MD

DATE: June 16, 1995

SUBJECT: **Scripps/ATOC** Modifications to CONSISTENCY CERTIFICATION CC-110-94 made during June 15, 1995 Commission public hearing.

During the June 15, 1995, Scripps incorporated the following project modifications into its project description and consistency certification for the ATOC/MMRP project. These modifications consist of:

1. Fisheries Biologist. Scripps agrees to include a fisheries biologist on the project team.

2. Fisheries Monitoring. Scripps' MMRP will include monitoring and analysis of impacts on fish behavior, and if any significant impacts are determined (as defined using the CEQA criteria in the April 1995 Final EIR for the project), Scripps will modify or stop sound transmissions in the same manner as described for marine mammals and sea turtles in Appendix C to the Final EIR.

3. MMRP Advisory Board. Scripps will recommend to the MMRP Advisory Board that it be expanded by one member to include a fisheries biologist.

(continued)

EXHIBIT NO. 6
APPLICATION NO. Exh. 6, 9, 10
California Coastal Commission

UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SANTA BARBARA • SANTA CRUZ

INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS (0225)
SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92093-0225

TELEPHONE: (619) 534-4688
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INTERNET: pworcester@ucsd.edu
OMNET: P. WORCESTER

February 29, 1996

California Coastal Commission
Attn: M. Delaplaine
45 Fremont, Suite 2000
San Francisco, Ca 94105-2219

Re: California Coastal Commission ltr dtd 2/22/96

Dear Mr. Delaplaine:

This letter responds to your February 22, 1996, letter regarding the alternate source test ("AST") that we propose to undertake in June of this year. As you know, the AST would involve a series of transmissions from a ship suspended sound source during a twelve day period. The principal purpose of the AST is to evaluate the long distance propagation characteristics at an alternate source frequency of 25 Hz. We have proposed to undertake the test at Pioneer Seamount primarily so that thorough marine mammal observations can occur using the systems already in place at that location.

Most of the points raised in your letter are well taken. We share the concern over possible interference with the existing Pioneer Seamount program and have agreed to reprogram funds to ensure that the existing project is not affected by the AST. We also recognize that the lower frequency transmissions have the potential to affect marine animals differently than the 75 Hz transmissions and for that reason have proposed the test at a location where extensive marine mammal observations can accompany the test. We also recognize that the limited period of the test will only provide preliminary data on potential acute effects of the 25 Hz sound source on marine animals and that there will not be sufficient data to address more subtle reactions. However, we feel that, on balance, the opportunity to obtain some preliminary data on marine mammal responses at Pioneer Seamount outweighs the negative factors

From a purely oceanographic perspective, undertaking the test at a remote location unconstrained by marine mammal research program needs might be considered preferable. However, none of those locations would permit the level of marine mammal observations available at Pioneer Seamount. Faced with a choice between obtaining limited data on marine animal responses to the alternate source frequency at Pioneer Seamount, and much less (if any) data elsewhere, we have proposed to

EXHIBIT NO. 7
APPLICATION NO.
ATOC Status Update

perform the test at Pioneer. This data could be important for future decision making if the 25 Hz source frequency proves superior for oceanographic purposes.

Thus, while the AST itself is primarily oceanography-based, the proposal to undertake the test at Pioneer Seamount is primarily biology-based. However, if there is serious disagreement that the benefits of performing the test at this location outweigh the costs, the test could be performed as an engineering test at a remote site, foregoing marine mammal data gathering opportunities.

With this background, the following are our responses to the questions posed in your February 22 letter. While we do not necessarily agree that all of these issues are pertinent to the threshold standards for consistency review, we are pleased to respond for the Commission's information.

Responses to questions posed in referenced letter are provided below:

1. *When do you anticipate your NEPA/CEQA documentation will be available?*

The combined environmental assessment/initial study (EA/IS) is anticipated to be available by March 31, 1996.

2. *What is the anticipated time frame for a response to the proposal by the MMRP Advisory Board?*

The MMRP Advisory Board has already been notified via written correspondence and a conference call on February 6, 1996. The Advisory Board Chairman is currently collating and compiling the Board's comments into a letter to be forwarded to the MMRP Director and NMFS early in March 1996.

3. *At what depth will the suspended source be transmitting?*

Approximately 700 m.

4. *There are a number of inconsistencies in the information and schedule presented. Please explain exactly what is meant by an 8% duty cycle. How many minutes would the signal be on at one time: 20 minutes or 40 minutes? Why do you describe the project as a 12-day test? Two 4 day periods with a 2 day control period in between comes to 10 days. Are you adding 1 day at either end to come up with a 12 day total? Your schedule (Research Protocol, p. 3) indicates that, from start to finish, the project is a 40+ day test. Please clarify.*

a. 8% duty cycle derivation: maximum number of transmission days would be 8; 8 x 140 min/day (five 20-min, one 40-min transmission) = 1,120 min total.

7 2

Total available minutes from start of first four-day period to end of second four-day period, including two-day control period in between = 14,400 min. 1,120 ÷ 14,400 = 7.8%.

b. The project was described as a 12-day test to include control aerial surveys prior to, and after the alternate source transmissions.

c. The 20 May - 1 Jul 96 time period referred to on p. 3 of the Research Protocol allowed ample time prior to and after the alternate source transmissions for control aerial surveys. These would also account for scheduled aerial surveys after the last ATOC source transmissions (prior to alternate source transmissions), and before the return to ATOC source transmissions (after alternate source transmissions).

5. *The normal ATOC/MMRP was initially estimated to take place over an 18-24 month period. It is our understanding this period has been reduced to approximately 10 months, due to funding shortages. Is this understanding accurate? How does this reduction to 10 months affect the project with regard to obtaining a statistically valid sample of responses from marine mammals?*

a. Delays caused by the permitting process and analysis of the humpback whale deaths during November-December 1995 have indeed compressed the time available for the MMRP. The current funding grant to Scripps ends September 30, 1996. This does not necessarily imply that all MMRP activities will terminate on that date; however, unless additional funds are identified, it is unlikely that the MMRP would continue beyond the final Advisory Board meeting, in the October-November 1996 timeframe.

b. Statistically valid sample sizes from the currently planned MMRP are still expected. In fact, aerial surveys to date have had higher marine mammal observation rates than expected.

6. *How will the reduction of more than a 40 day period from the normal ATOC/MMRP monitoring further affect its statistical validity?*

Funds will be rebudgeted to provide for additional replicates to replace any replicates that would have occurred during the time of the alternate source test.

7. *Would Scripps agree to extend the normal MMRP/ATOC study the 40 or more days being lost to this alternative study, so that no statistical validity will be threatened? If not why not?*

See 6. above.

7 3

8. *How will the schedule be changed in the event of bad weather? How far can the schedule slip due to weather problems before it would be cancelled?*

Climatological conditions expected at the Pioneer Seamount were taken into account in determining the optimum timing for the alternate source test, but ship availability is also a primary determinant. Inclement weather would impinge directly on the number of alternate source transmissions, as there is limited possibility of slipping the ship availability schedule.

9. *Page 1 of the proposed Research Protocol states:*

> *The MMRP Director... will ensure that the total number of ATOC source replicates and aerial surveys during the course of the MMRP will not be significantly changed with the inclusion of the alternate source period.*

What does the phrase "will not be significantly changed" in that sentence mean? What would you consider a statistically significant change?

See 6. above.

10. *What is the statistical validity of monitoring a 12 day period of marine mammal responses to a sound source at the newly proposed frequency? How could any conclusions be generated based on such a short time period that could be relied upon for any biological conclusions, and how would the 12 day,25 Hz effort be compared statistically with the 10 month, 75 Hz effort?*

The proposed measurements cited in the Research Protocol are designed to monitor any potential acute responses from marine animals, or visible behavioral disruption (i.e., measurable and marked decrease in number of animals prior to vs. during/after source transmission). We agree that an insufficient sample size will be obtained for studying more subtle responses.

11. *What are the relative populations of blue whales in the greater project region for the months of June-December? Why is the alternative source not being proposed during a time period where there would be greater populations of blue whales in the vicinity, assuming for the purposes of discussion that a 12 day monitoring effort could provide any meaningful biological information?*

June is traditionally the month that blue whales start appearing in the Pioneer Seamount area. The alternate source test is not being proposed during a time period where there would be greater populations of blue whales in the vicinity because of logistical and source ship scheduling constraints.

12. *What is the expected impact on blue whales, fin whales, and any other potentially affected marine resource from modifying the proposal from a single frequency source to a dual frequency source? If the project is supposed to achieve a potential benefit of ultimately evolving to a lower frequency source (and hopefully utilizing a lesser intensity or reduced duty cycle), then why is Scripps not proposing simply to transmit a single frequency 25 Hz sound, rather than the proposed 25 Hz and 75 Hz sound? Isn't it reasonable to assume that the impact from such a dual source should be considered double, or certainly greater, than that of a single frequency sound, because a greater number of animals would be potentially affected?*

It is not feasible to transmit a single frequency 25 Hz sound from the acoustic projector (HLF-6A) proposed for use. The 75 Hz transmissions are actually formed from third harmonics of the 25 Hz signals. As the estimated maximum source levels are 195 dB at 75 Hz and 186-188 dB at 25 Hz, the latter transmissions are about 80% lower intensity than the former. Comparison of acoustic propagation at the two frequencies will reveal any benefits that might ultimately be realized by using a 25 Hz source. It is not expected that the source to be used in this test (HLF-6A) would be the one ultimately used, should the use of frequencies in the 25 Hz range prove beneficial.

As you know, limited information exists on the potential impacts of low frequency sounds on marine animals, as we presented at some length in the EIS/EIR for the ATOC project and MMRP. A 25 Hz frequency is closer to the dominant frequencies used by certain large marine mammals, such as blue and fin whales, which is a factor that might tend to increase potential impacts. However, if a 25 Hz frequency proves more efficient for long distance transmissions, reductions in transmission duty cycle or intensity may be possible. Without undertaking additional tests, the relative potential environmental impacts at 25 Hz as compared to 75 Hz are largely speculative. At this juncture, we forecast that any impacts will be similar, and that given the limited time period of the proposed test any impacts will be less than significant. The purpose of undertaking the AST at Pioneer Seamount is to be able to respond to questions such as these from an increased knowledge base.

13. *Why did your initial EIS consider boat based sound transmissions to be infeasible, but you are now proposing to use them? Wasn't ship noise a complicating factor? How statistically will ship noise be factored out of any marine mammal response?*

a. Boat-based transmissions are most effective for short- term studies since they involve much smaller setup costs. Short- term studies can address useful issues such as engineering feasibility and potential acute impacts on marine animals. Long- term studies are necessary for other purposes, such as the evaluation of more subtle changes in marine mammal behavior, which are the principal focus of the Pioneer Seamount MMRP. While mobile sources have lower setup costs, they entail

much greater ongoing operational costs, making them infeasible for long-term studies. Thus, a fixed sound source is necessary for longer term studies due to power and other logistical concerns.

b. Ship noise is an inherent complicating factor, and cannot be factored out of marine mammal response analyses; however, it would be minimized by having the ship maintain station throughout the test, so that ship noise would be similar during the time the ship is on site.

We appreciate your attention to this proposal and look forward to the Commission's response at the March hearing. If you have any further questions, please feel free to contact me.

Sincerely,

Peter Worcester
ATOC Principal Investigator

cc:
ARPA (A. Cheaure)
Cornell (C. Clark)
UCSC (D. Costa)
MAI (C. Spikes)
NMFS/OPR (J. Drevenak)
NMFS, Long Beach (Cardero)
MBNMS (Jackson)
GOFNMS (Ueber)
OCRM

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W12a

Consistency Determination	No. CD-13-96
Staff:	JRR-SF
File Date:	2/5/96
45th Day:	3/21/96
Commission Meeting:	3/13/96

FEDERAL AGENCY: **CORPS OF ENGINEERS**

DEVELOPMENT LOCATION: San Lorenzo River, City of Santa Cruz (Exhibit 1)

DEVELOPMENT DESCRIPTION: Modifying landside of the flood-control levees to allow planting of trees and shrubs.

SUBSTANTIVE FILE DOCUMENTS:

1. San Lorenzo River, California, Feasibility Study: Final Main Report, Environmental Assessment, and Appendices A-D; February 1994.

2. The San Lorenzo Watershed Management Plan, December 1979.

3. CD-20-94; A Consistency Determination by the Corps of Engineers for modifications to the San Lorenzo River Flood-Control Facility.

4. Draft Environmental Assessment for San Lorenzo River, Section 1135 Restoration Study, City of Santa Cruz, January 1996.

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (Corps) proposes to landscape the landside of the levees on the San Lorenzo River in Santa Cruz. Specifically, the project includes placement of fill and soil and planting of trees, shrubs, and herbaceous plants on the land-side of the levee slope. The project does not provide for any restoration of river or lagoon habitat.

The project will enhance visual and recreational resources of the coastal zone by improving scenic quality of the levees. The project will not result in significant adverse or beneficial impacts to

terrestrial, river, or lagoon habitats. Although the project has limited restoration value, it does not have any significant adverse effects on coastal resources, and is, therefore, consistent with the CCMP.

STAFF SUMMARY AND RECOMMENDATION:

I. Project Description.

The Corps submitted a consistency determination for the San Lorenzo River Enhancement Plan. Congress funded the project pursuant to Section 1135 of the Water Resources Development Act of 1986, which is for projects that restore habitat affected by the original construction of Corps public works projects. The project on the San Lorenzo River includes importing soil to the landside of the existing levees and planting a variety of plant species to resulting in approximately 10.5 acres of landscaped levee slope.

II. Status of Local Coastal Program.

The standard of review for federal consistency determinations is the policies of Chapter 3 of the Coastal Act, and not the Local Coastal Program (LCP) of the affected area. If the Commission certified the LCP and incorporated it into the CCMP, it can provide guidance in applying Chapter 3 policies in light of local circumstances. If the Commission has not incorporated the LCP into the CCMP, it cannot use the LCP to guide the Commission's decision, but the it can use the LCP as background information. The Commission has not incorporated the City of Santa Cruz's LCP into the CCMP.

III. Federal Agency's Consistency Determination.

The U.S. Army Corps of Engineers has determined the project to be consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Staff Recommendation:

The staff recommends that the Commission adopt the following resolution:

A. **Concurrence**.

The Commission hereby **concurs** with the consistency determination made by the U.S. Army Corps of Engineers for the proposed project, finding that the project is **consistent** to the maximum extent practicable with the enforceable policies of the California Coastal Management Program.

V. Findings and Declarations:

The Commission finds and declares as follows:

A. Visual Resources. Section 30251 of the Coastal Act provides, in part, that:

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

The proposed project will improve visual resources of the coastal zone. The landside of the existing levee currently consists of dirt and rip rap slopes and does not support significant amounts of vegetation. The existing character of the levee is an eyesore that degrades the visual quality of the area. The proposed project will enhance the visual resources of the area by planting native trees, shrubs, and herbaceous vegetation on the landside of the levees. Thus, the project will improve the visual quality of the levees. Additionally, the project will improve one of the negative impacts from the flood-control improvement project that the Commission concurred with in 1994 (CD-20-94). That project includes construction of "floodwalls" on top of the levees. In reviewing that project, the Commission found that the floodwalls would degrade visual resources of the coastal zone. Specifically, the Commission found that:

> *These floodwalls have the potential to block coastal views and otherwise degrade visual resources. However, this impact will not be significant. Within in the coastal zone, the floodwalls will be between 1.5 feet and 2.5 feet high .... The floodwalls will be constructed on top of an existing levee. The previously constructed levees have already degraded the visual resources of this area. From public areas adjacent and near the river, views are blocked or otherwise degraded by the existing levees. The 1.5 to 2.5 additional height to the levees created by the proposed project will not significantly change existing views (or lack thereof) from public places. Additionally, the floodwalls will be visually compatible with the character of a channelized river with rip rapped levees. Therefore, the Commission finds that the proposed project will not affect visual resources of the area, and thus the project at its conceptual phase is consistent with the visual policies of the CCMP.*

Although the Commission found the visual impact from the floodwalls to be consistent with the CCMP, the proposed enhancement project will remove any residual impact. The fill material imported for this project will cover the existing landside of the levees up to the top elevation of the proposed floodwalls. Therefore, floodwalls and the riprap slopes will be covered by soil and

vegetation. In conclusion, the Commission finds that the project will improve visual resources of the coastal zone, and therefore, is consistent with visual resource policy of the CCMP.

B. Recreational Resources. Section 30210 of the Coastal Act provide that:

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

Section 30223 of the Coastal Act provides that:

> *Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.*

The public uses the access roads on top of the levees adjacent to the San Lorenzo River for walking, running, bicycling, and access to the shoreline. The Corps' environmental assessment for the improvements to the flood-control channel describes this recreational resource as follows:

> *The paved tops of the levees accommodate pedestrian and bicycle traffic and provide easy access to the beach, amusement park, commercial and residential districts, historic sites, and government buildings.*

The proposed landscaping may interfere with recreational use of the levees during construction and after completion of the project. Construction activities on the levees will restrict access to and use of the levee in order to protect public safety. However, this impact will not be significant, because it will be temporary and the Corps will only restrict access at the construction point not along the entire length of the levees. Therefore, the landscaping of the levees will not significantly interfere with recreational use of the levees.

Once the Corps completes the landscaping, it may affect access to the levees. However, this recreational impact will not be significant. The landscaping will not affect public use of the existing access road on top of the levees. Although the landscaping will make it little more difficult to access the levees, they will not prevent it. After landscaping the slopes, the public will have to navigate around the vegetation to access the levee tops. The project will offset this minor inconvenience by improving the visual resources of the area. Therefore, the Commission finds that the project will not interfere with recreational use of the levee road.

In conclusion, the Commission finds that the landscaping will have temporary and minor effects on recreational resources of the coastal zone. Additionally, the landscaping will not interfere with public use of the levee access road. Therefore, the Commission finds that the proposed project is consistent with the recreational policies of the CCMP.

C. Habitat. Section 30231 of the Coastal Act provides that:

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

Section 30240 of the Coastal Act provides that:

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

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

The San Lorenzo River provides habitat for anadromous fish, including coho salmon and steelhead trout. The Fish and Wildlife Service (Fish and Wildlife Coordination Report, February 1994) describes the fish habitat value of this river as follows:

The principle fish species in the San Lorenzo River and Branciforte Creek are anadromous steelhead and coho salmon. The river is recognized as one of the most important steelhead streams south of San Francisco. In 1964, the California Department of Fish and Game (CDFG) estimated the adult steelhead run size at 20,000 fish. Since that time, the steelhead population has steadily declined. The 1978-79 run was estimated by the CDFG at 625 steelhead, and the run has subsequently remained at low levels.

....

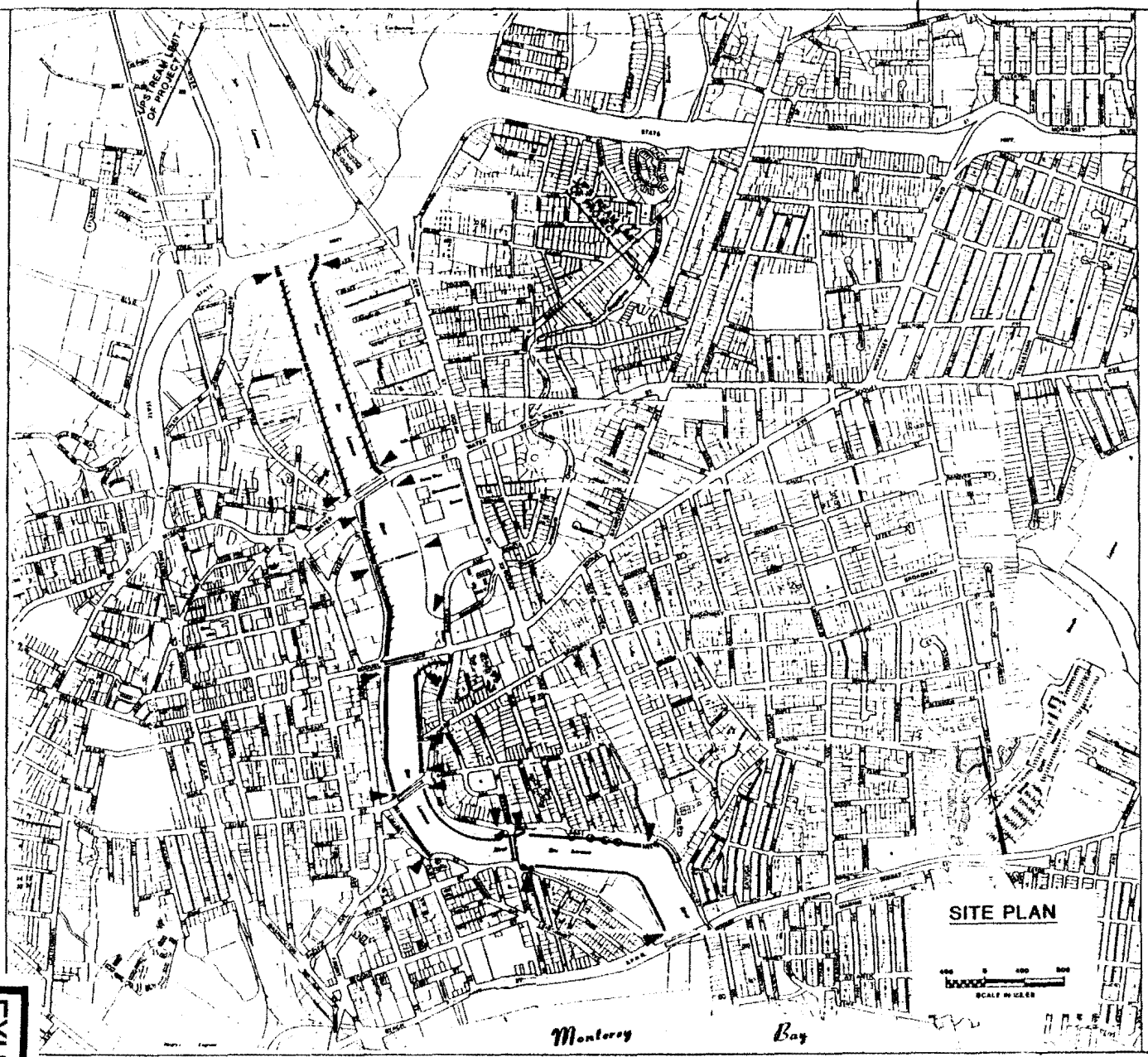
Historically, natural runs of coho salmon also enter the San Lorenzo River and Branciforte Creek for spawning. The river is among the southernmost streams in the Pacific Coast that have supported a coho salmon run. In 1965, the CDFG estimated the annual run of coho

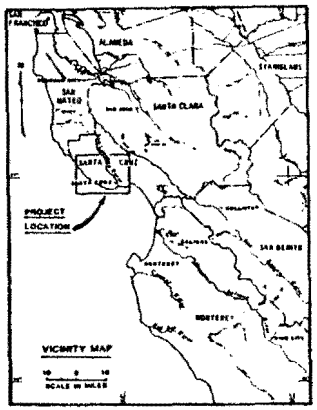
salmon to be about 1,600 fish. By 1979, the coho run had declined to about 100 fish. Since that time juvenile coho were observed in the river in 1981, and adult observations have been sporadically reported during the 1980's. No quantitative estimate of the current coho population is available.

The portion of the San Lorenzo River affected by the proposed project also contains some limited riparian habitat. In constructing and maintaining the original flood-control project, the Corps has severely degraded this habitat resource. However, the river continues to support some riparian habitat.

The Corps of Engineers describes the purpose of the project to "improve habitat conditions for fish and wildlife" and "to restore to the maximum extent practical habitats lost as a result of the existing 1959 flood control project." The Commission strongly disagrees with Corps conclusion that the proposed project will benefit fish and wildlife resources. The project is limited to planting of terrestrial vegetation on the land side of the existing levees. This vegetation will be over sixty feet from the river channel, and thus, will not provide significant benefit to fisheries or riparian resources. The trees are too far from the river to provide any significant amounts of shading or detritus to the aquatic environment. Additionally, the amount of area planted by the Corps (10.5 acres) is to small to provide significant benefits to terrestrial wildlife. Therefore, the Commission concludes that the project will not result in enhancement of habitat resources. Rather than characterize the project as a habitat enhancement project, the Corps should describe the project as a landscaping project.

As a landscaping project, the Commission finds that the proposed project does not affect existing fisheries or other environmentally sensitive resources. As described above, the project does not include any instream construction or removal of existing riparian resources. Additionally, the landside of the levees do not support any endangered or otherwise sensitive species, and thus, the project will not affect any environmentally sensitive habitat. Therefore, the Commission finds that the project is consistent with the habitat policies of the CCMP.





SCHEDULE OF DRAWINGS		
SHT NO	PROJECT	TITLE OF DRAWINGS
1	SAN LORENZO RIVER	SITE PLAN AND VICINITY MAP
2	SAN LORENZO RIVER	PROFILE
3	SAN LORENZO RIVER	PLAN
4	SAN LORENZO RIVER	PLAN
5	SAN LORENZO RIVER	PLAN, TYPICAL CROSS SECTIONS AND DETAIL

LEGEND:

- RAISED EXISTING GABION WALL
- TRANSITION BERM
- CONCRETE CAPPED SHEETPILE FLOODWALL
- PRECAST CONCRETE BLOCK FLOODWALL
- RIVER ACCESS LOCATION

OTHER PROJECT FEATURES

1. STOPLOG STRUCTURE AT SOUTHERN PACIFIC RAILROAD BRIDGE AREA
2. FLOOD PROOFING OF BUILDING AT SANTA CRUZ GOVERNMENT CENTER
3. RAISE SOQUEL AVENUE BRIDGE APPROXIMATELY THREE FEET
4. REPLACE OLD HALF OF WATER STREET BRIDGE
5. PROVIDE TOE DRAINS ALONG INTERIOR SIDE OF LEVEES
6. OVERFLOW PROTECTION FOR THE INTERIOR SIDE OF LEVEE NORTH OF WATER STREET BRIDGE FOR 1200 LINEAL FEET ALONG THE WEST LEVEE

U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO
CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

SANTA CRUZ COUNTY CALIFORNIA
SAN LORENZO RIVER FEASIBILITY STUDY
SAN LORENZO RIVER/
BRANCIFORTE CREEK
SITE PLAN, VICINITY MAP AND
SCHEDULE OF DRAWINGS

PLATE 1

EXHIBIT NO. 1
APPLICATION NO.
CO-13-96

California Coastal Commission

EXHIBIT NO. 1
APPLICATION NO. CD-13-96
California Coastal Commission

LEGEND

REVEGETATION AREAS

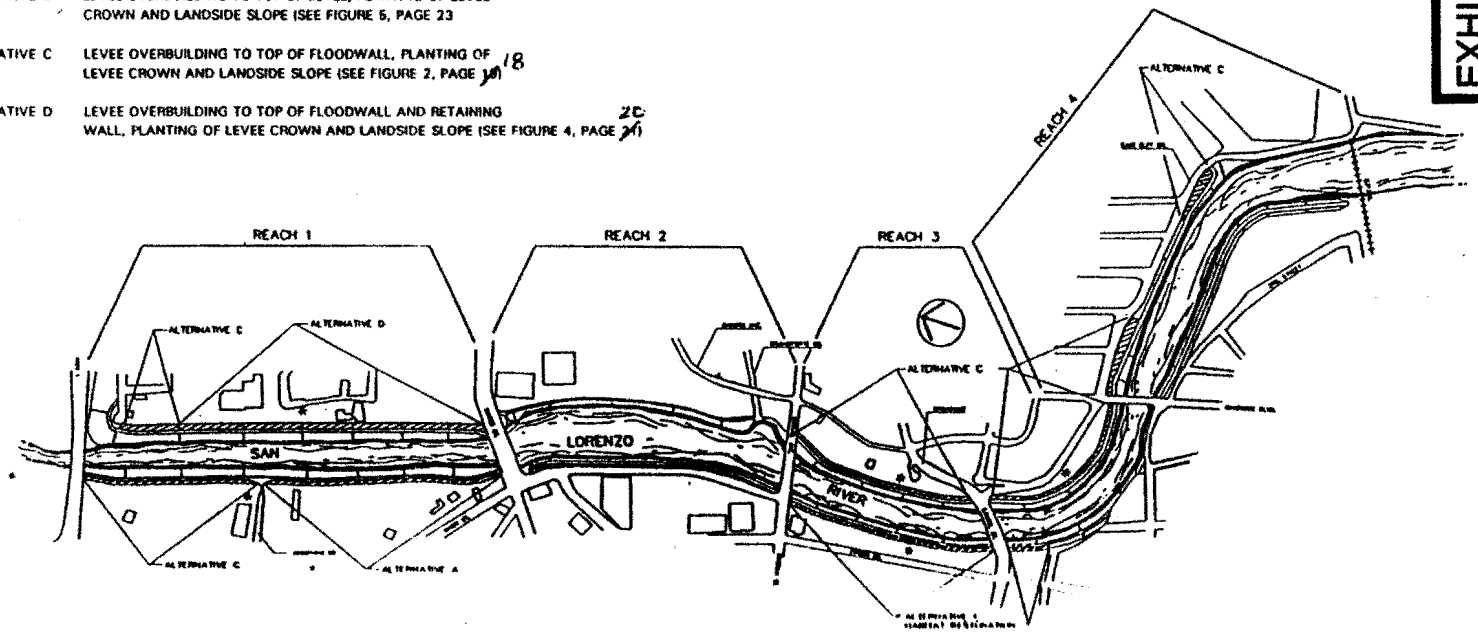
* IRRIGATION POINTS OF CONNECTION TO DOMESTIC WATER MAINS (PRELIMINARY)

ALTERNATIVE A — PLANTING ALONG LEVEE TOE ONLY (SEE FIGURE 3, PAGE 19)

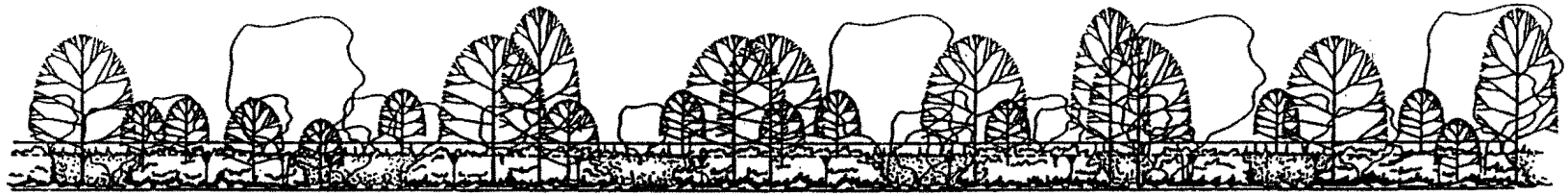
ALTERNATIVE B — LEVEE OVERBUILDING TO TOP OF LEVEE, PLANTING OF LEVEE CROWN AND LANDSIDE SLOPE (SEE FIGURE 5, PAGE 23)

ALTERNATIVE C — LEVEE OVERBUILDING TO TOP OF FLOODWALL, PLANTING OF LEVEE CROWN AND LANDSIDE SLOPE (SEE FIGURE 2, PAGE 18)

ALTERNATIVE D — LEVEE OVERBUILDING TO TOP OF FLOODWALL AND RETAINING WALL, PLANTING OF LEVEE CROWN AND LANDSIDE SLOPE (SEE FIGURE 4, PAGE 20)



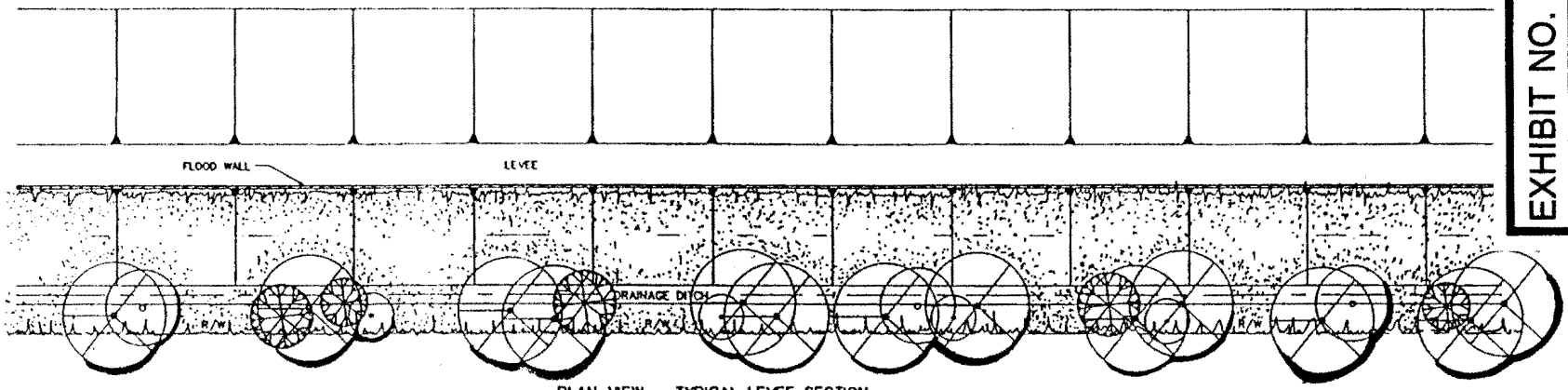
SELECTED PLAN — SAN LORENZO RIVER PROJECT



TYPICAL ELEVATION C-1

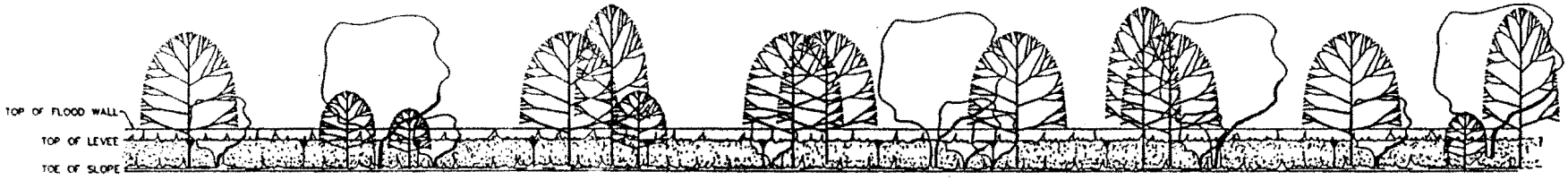
Figure 1

EXHIBIT NO. 3
APPLICATION NO. CD-13-96
California Coastal Commission



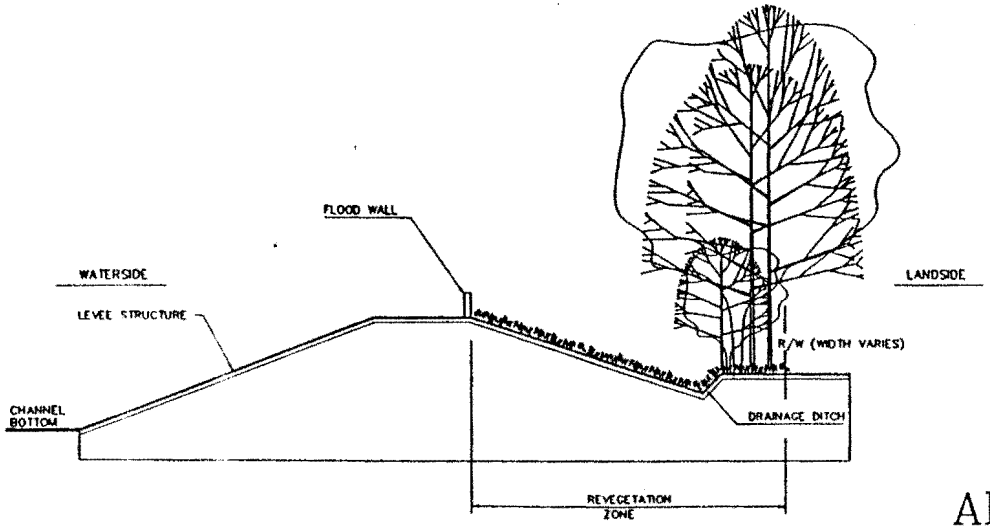
PLAN VIEW – TYPICAL LEVEE SECTION

SCALE: 1"=20' 0 20' 40' 60' 80' 100'



LANDSIDE ELEVATION – TYPICAL LEVEE SECTION

SCALE: 1"=20' 0 20' 40' 60' 80' 100'



TYPICAL LEVEE CROSS SECTION

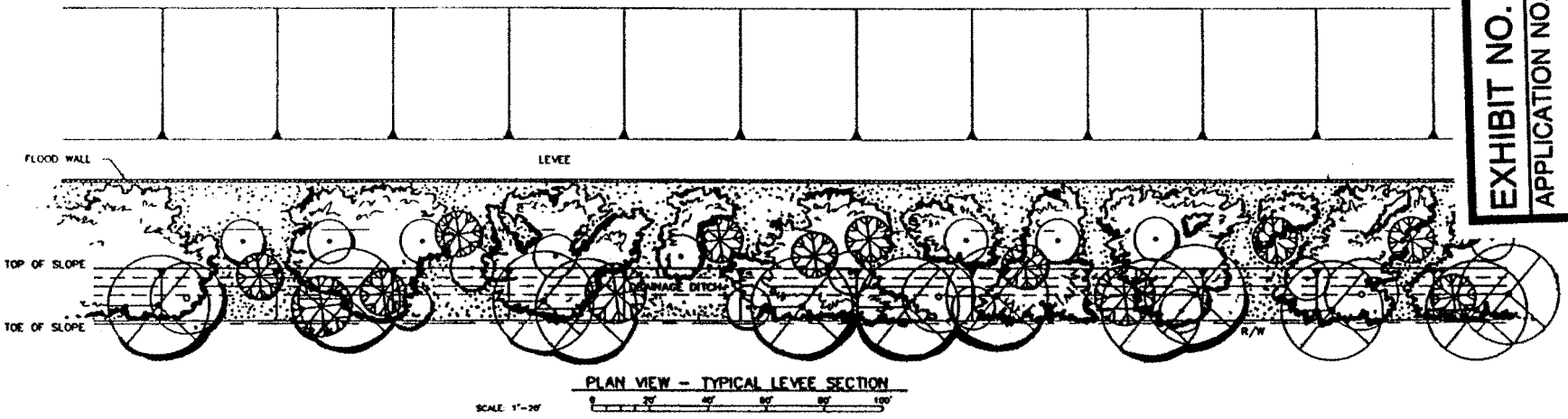
SCALE: 1"=10' 0 10' 20' 30' 40' 50'

ALTERNATIVE A

NOTE: REFER TO REPORT LEVEE ALTERNATIVES FOR DETAILED SECTION INFORMATION

Figure 3

EXHIBIT NO. 4
APPLICATION NO. CD-13-96
California Coastal Commission



PLAN VIEW – TYPICAL LEVEE SECTION

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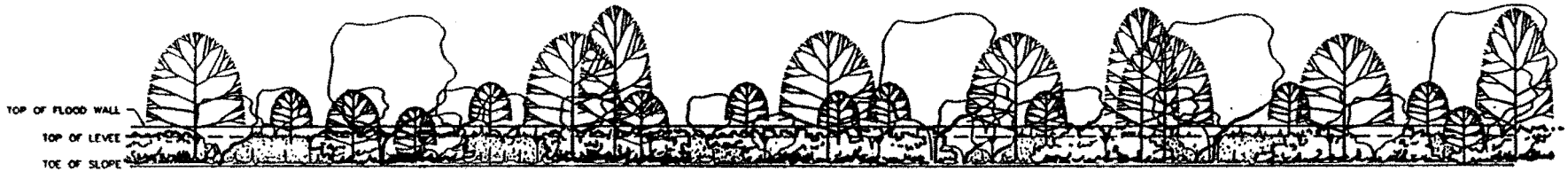

LANDSIDE ELEVATION – TYPICAL LEVEE SECTION

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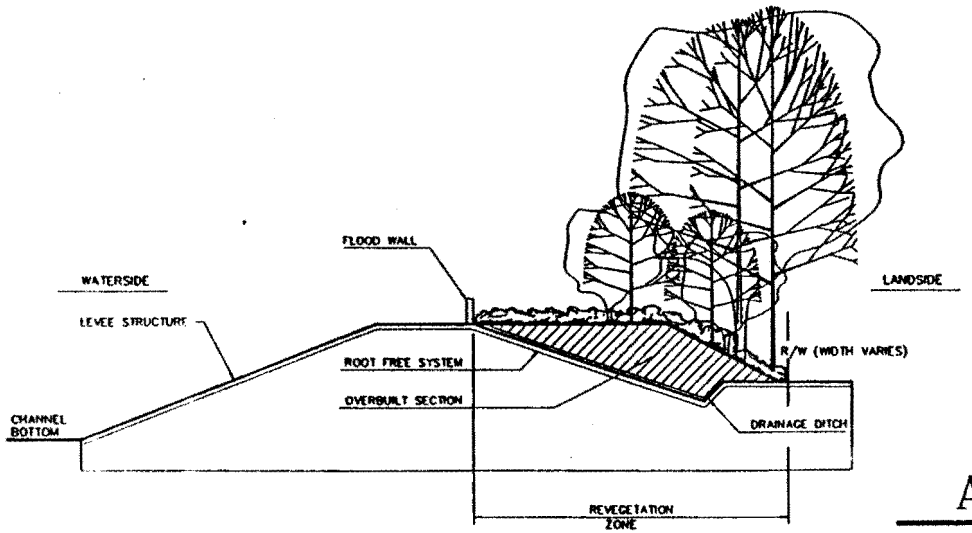


TYPICAL LEVEE CROSS SECTION

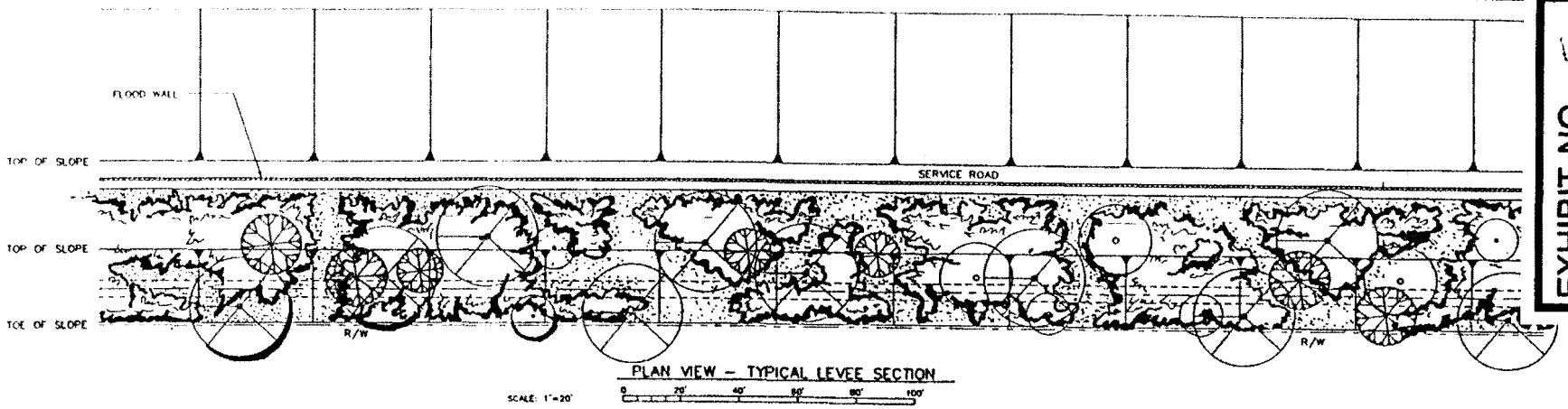
SCALE: 1"=10' 0 10' 20' 30' 40' 50'

ALTERNATIVE B

NOTE: REFER TO REPORT LEVEE ALTERNATIVES FOR DETAILED SECTION INFORMATION

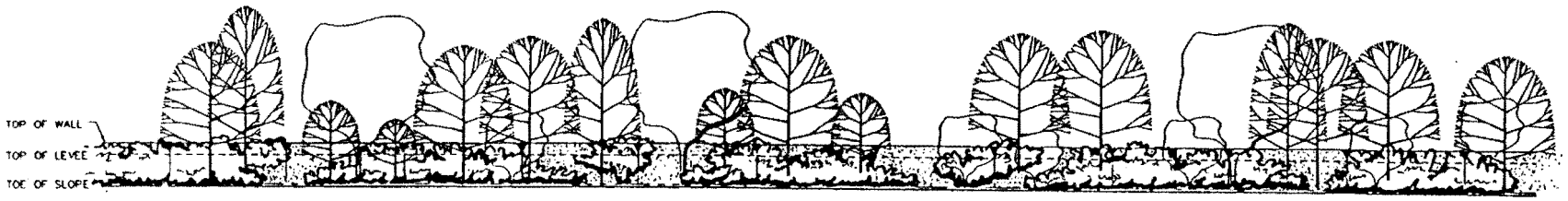
Figure 5

EXHIBIT NO. 5
APPLICATION NO.
5-0-13-[illegible]
California Coastal Commission



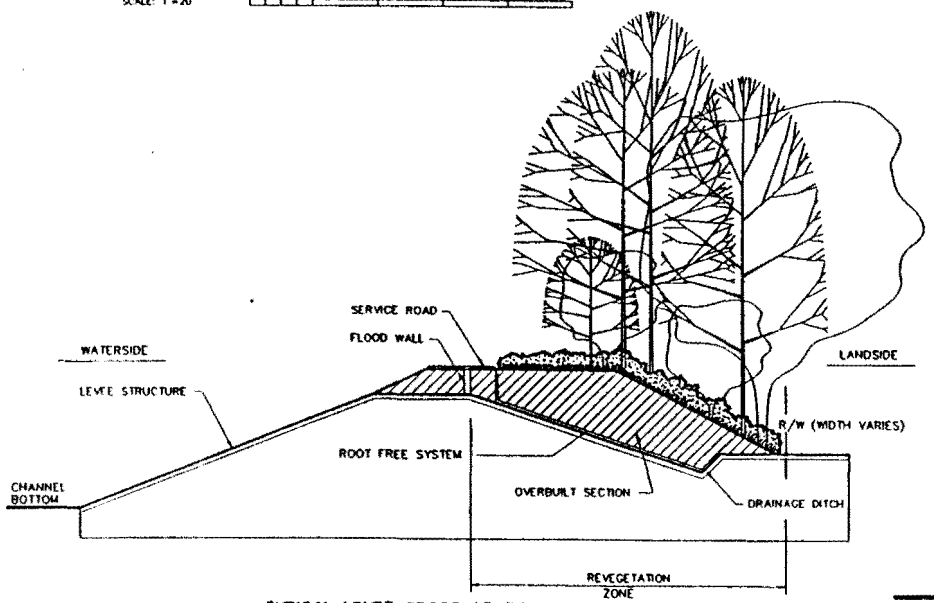
PLAN VIEW – TYPICAL LEVEE SECTION

SCALE: 1"=20'



LANDSIDE ELEVATION – TYPICAL LEVEE SECTION

SCALE: 1"=20'



TYPICAL LEVEE CROSS SECTION

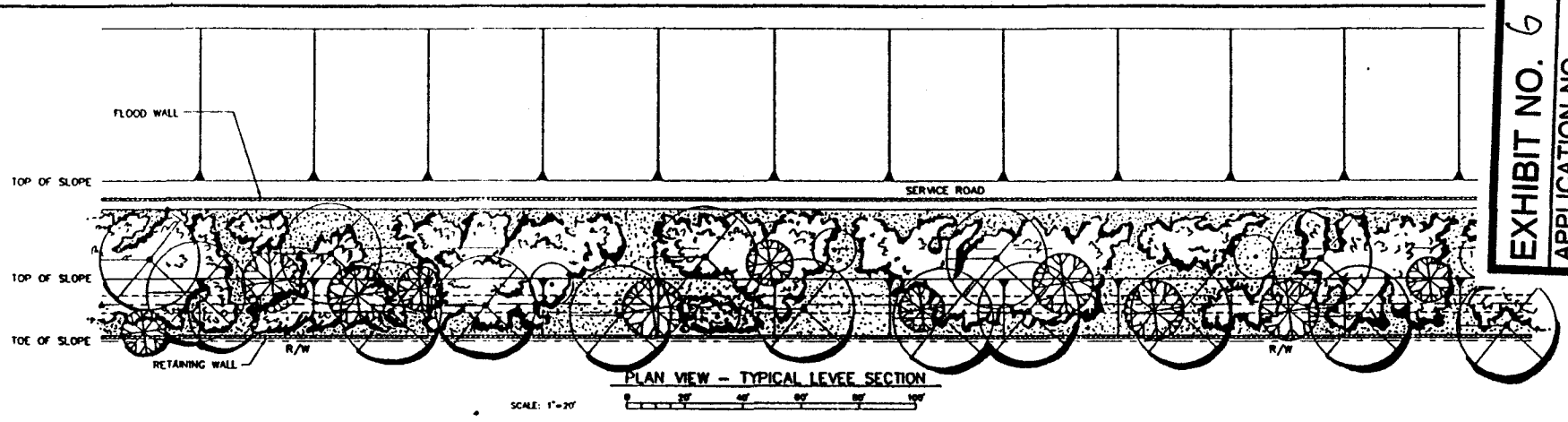
SCALE: 1"=10'

ALTERNATIVE C

NOTE: REFER TO REPORT LEVEE ALTERNATIVES FOR DETAILED SECTION INFORMATION

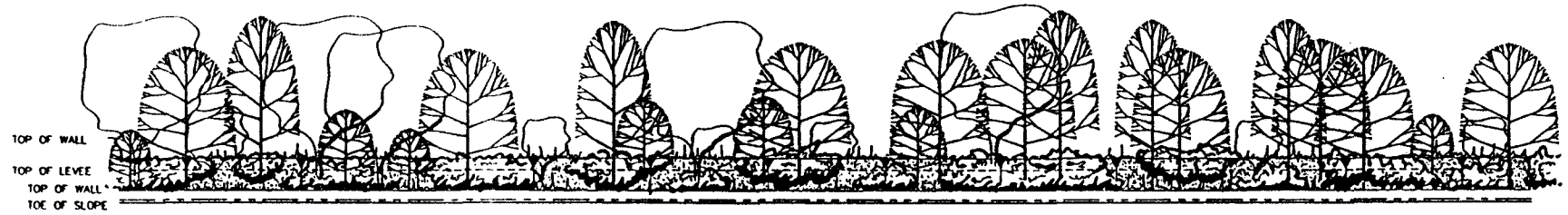
Figure 2

EXHIBIT NO. 6
APPLICATION NO. CO-13-96
California Coastal Commission



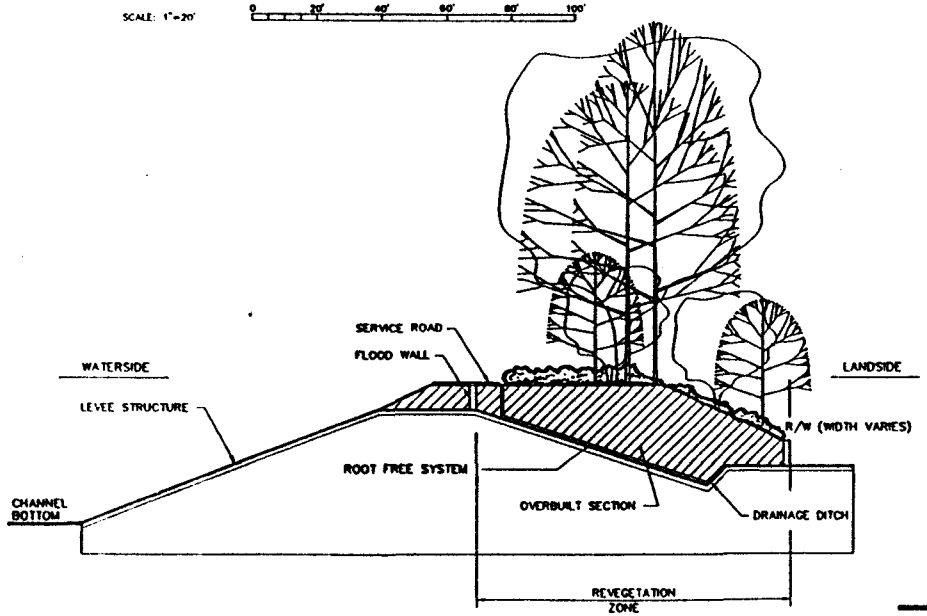
PLAN VIEW – TYPICAL LEVEE SECTION

SCALE: 1"=20'



LANDSIDE ELEVATION – TYPICAL LEVEE SECTION

SCALE: 1"=20'



TYPICAL LEVEE CROSS SECTION

SCALE: 1"=10'

ALTERNATIVE D

NOTE: REFER TO REPORT LEVEE ALTERNATIVES FOR DETAILED SECTION INFORMATION

Figure 4