

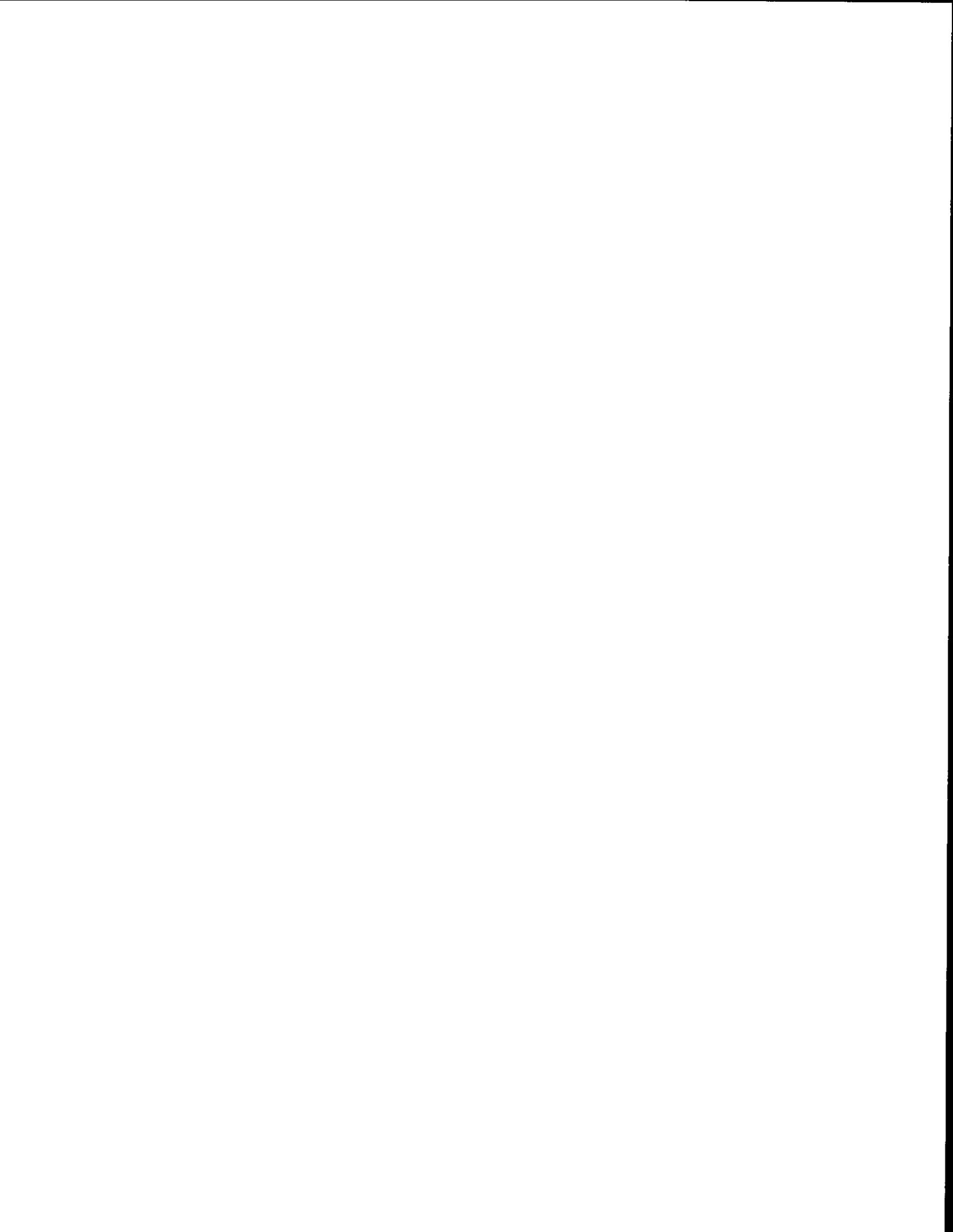
**E-12-005 / CC-027-12  
Pacific Gas & Electric Co.**

**CORRESPONDENCE**

- **Ex-Parte Communications**
- **Applicant: Pacific Gas & Electric Co.**
- **Federal / State Agencies**
- **Local Government / Tribal**
- **Private Organizations**
- **E-mails to CCC Staff, Cassidy Teufel**
- **Opposition Letters from Interested  
Individuals**

**E-12-005**  
**PG&E SEISMIC SURVEY**

**EX-PARTE COMMUNICATIONS**



FORM FOR DISCLOSURE  
OF EX PARTE  
COMMUNICATIONS

RECEIVED

NOV 02 2012

Name of description of project, LCP, etc.:

PG&E Seismic Survey

Date of receipt of communication:

10/5/12 10:45 AM

Location of communication:

Sacramento, Ca

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

meeting

Person(s) initiating communication:

Mark Krause, PG&E

Person(s) receiving communication:

Mary Shallenburger

Detailed substantive description of content of communication:  
(Attach a copy of the complete text of any written material received.)

Mark gave me a brief legislative history of the bill that resulted in this project. He explained that the CPUC created the Independent Peer Review panel (IPRP) to give technical input on the project. He explained that Supervisor Bruce Gibson believes that PG&E should be using a 10 streamer array, instead of what's proposed. He said that no one on the IPRP really has expertise on this technology. He said that the size of the project is being reduced to include only the Survey Box 4 which has the shortest duration of the different segments of the full project. They are doing weekly aerial surveys. He said that some ask if they really need to use high energy 3D. He laid out the time constraints for PG&E to get the surveys completed in time for the re-issuing of Diablo's license by FERC.

10/15/12  
Date

Mary K. Shallenburger  
Signature of Commissioner

If the communication was provided at the same time to staff as it was provided to a Commissioner, the communication is not ex parte and this form does not need to be filled out.

If communication occurred seven or more days in advance of the Commission hearing on the item that was the subject of the communication, complete this form and transmit it to the Executive Director within seven days of the communication. If it is reasonable to believe that the completed form will not arrive by U.S. mail at the Commission's main office prior to the commencement of the meeting, other means of delivery should be used, such as facsimile, overnight mail, or personal delivery by the Commissioner to the Executive Director at the meeting prior to the time that the hearing on the matter commences.

If communication occurred within seven days of the hearing, complete this form, provide the information orally on the record of the proceeding and provide the Executive Director with a copy of any written material that was part of the communication.

FORM FOR DISCLOSURE  
OF EX PARTE  
COMMUNICATIONS

Date and time of communication: Oct 4, 2012

Location of communication: my office  
(If communication was sent by mail or facsimile, indicate the means of transmission.)

Identity of person(s) initiating communication: David Neish, DB Neish

Identity of person(s) receiving communication: Mark Krause PG & E

Name or description of project: Bocheo  
Diable Canyon - Seismic Project

Description of content of communication:  
(If communication included written material, attach a copy of the complete text of the written material.)

see attached

10/4/12  
Date

[Signature]  
Signature of Commissioner

If communication occurred seven (7) or more days in advance of the Commission hearing on the item that was the subject of the communication, complete this form and transmit it to the Executive Director **within** seven (7) days of the communication. If it is reasonable to believe that the completed form will not arrive by U.S. mail at the Commission's main office prior to the commencement of the meeting, other means of delivery should be used, such as facsimile, overnight mail, or personal delivery by the Commissioner to the Executive Director at the meeting prior to the time that the hearing on the matter commences.

If communication occurred within seven (7) days of the hearing, **complete** this form, provide the information **orally** on the record of the proceeding **and** provide the Executive Director with a copy of any written material that was part of the communication.

Applicants started by outlining the history of the project, AB 1632 and a subsequent bill that went through the Legislature but was vetoed by the governor that would have mandated high intensity 3D testing. PG&E had been against this testing, thinking that their existing technology and tests were sufficient.

Diablo has been built to withstand .75G earthquake and all the testing shows it can more than meet this standard. The prior technology was like "xray" vs the new which is "MRI" and they have come to believe that they should do the most current testing to insure their prior findings are good.

Prior to our meeting they had heard from NMFS that they were not going to be allowed to do Box 2 and Box 4 in the same year. Then heard from Commission staff that County Supervisor Bruce Gibson had proposed a different technology (10 streamers) but hadn't gotten enough analysis of that method. So PG&E withdrew Oct. application and postponed until November.

Also, this allows them to use Box 4 as a "test" of the method: Box 4 is not near the MLPA and will last only 9 days. If no severe "harassment" occurs and the data is valuable, then will do Box 2.

I asked several questions: What can the high intensity 3D tests show prove that you don't already know? They know the Hosgri fault is no more than .75g, but high intensity 3D will confirm that. They are pretty sure the Shoreline fault does not intersect with Hosgri, but 3D will confirm/disaffirm that.

What action would be taken if 3D test showed Hosgri to be more than .75G? It would affect the NRC licensing process. Do they need an amendment for retro fits, or, if retro fits are not possible, must they retire the plant and look for replacement energy. There is also the issue of spent fuel --- how a larger fault/seismic event would effect that.

I asked why there was no impact studies on prior high intensity testing, since these tests had been done, according to applicants, in Siberia and off the coast of Washington? They said that there were mammal studies. They are going to get ahold of as much information on this as possible.

I asked if a risk analysis between the relative importance of the new information that might be garnered from this testing and the projected impacts to the environment have been or could be done? PG&E is pretty sure that there will be no lasting impacts, that is, they are sure the fish and mammals will leave but won't die. I asked what information that had that proved the mammals would come back --- they were going to get me more info on this.

We agreed that I would meet with them and whatever experts they had, most likely at the Oceanside/Oct commission meeting.

# FORM FOR DISCLOSURE OF EX PARTE COMMUNICATIONS

Name or description of project, LPC, etc.: PG&E -Diablo Canyon  
Sept 21

Date and time of receipt of communication: \_\_\_\_\_  
telephone

Location of communication: \_\_\_\_\_  
Michael Jasney, Karen Garrison NRDC

Type of communication (letter, facsimile, etc.): \_\_\_\_\_

Person(s) initiating communication: Bochco

Detailed substantive description of content of communication:  
(Attach a copy of the complete text of any written material received.)

\_\_\_Went through slide presentation which is attached. Started with brief discussion of Navy studies of the effect on human divers to underwater sonar. 145 db was the maximum. Sensitive mammals respond to 90db and above. The slides show how the airgun sound reverberates in the water --- Diablo project is going to use 18 airguns, repeating sound every 12 seconds for 24 hours per day for over 50 days. Levels of db that can cause injury : 120db and for each db, increase intensity by ten times.

Slide 6 shows that whales subject to airguns fell silent and left the area. The foraging areas are where they need to eat and where they communicate to each other where food is ---- all disturbing behavior. Some animals don't leave because they cannot forage elsewhere --- they suffered the most injury.

Diablo vs past studies: this project is nearer to coast than the other studies. These coastal animals don't have anywhere to go and we don't know what the result of this activity will do. Slide 10 is a Norway study that looked at the impact on fish density and catch rates after one minor air gun blast. After 5 days, the fish had not rebounded. So impact on fisheries are unknown. Do know that the fish disappeared many miles from the site of the air gun pblast.

Slide 8 deals with Harbor porpoise\_\_whose core habitat is directly in Zone 1. Only 2000 exist in this harbor and known to be highly sensitive to human sound. React by fleeing but don't have anywhere in this project zone to go. Zone 2 runs across the core habitat, only Zone 4 is the least impactful.

No studies have been done on the sea otter and noise. Do know that Oct and Nov are key breeding season.

There has been no cost benefit analysis to this project. What uncertainty will be removed that can't be discovered by other means and how important is this

uncertainties resolution compared to the damage to the coast. Is every zone (paraticularly Zone 1) really necessary to resolve some critical uncertainty.

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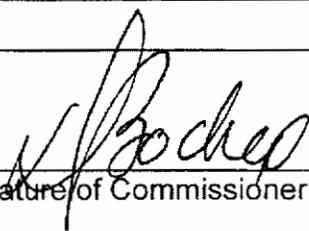
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9/21/12  
Date

  
Signature of Commissioner

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## Introduction to a seismic airgun ship



Source: PGS

# How seismic works

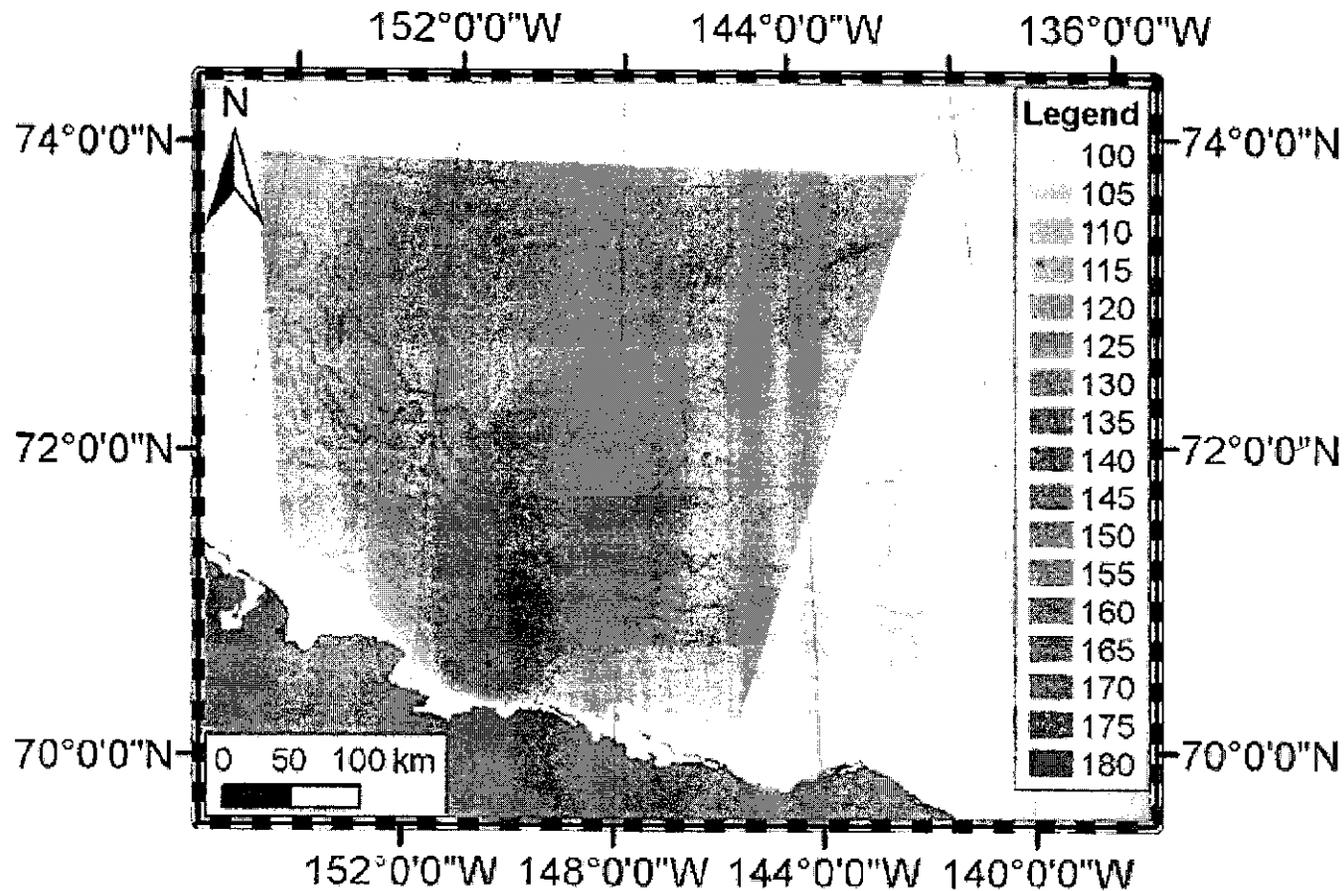


## Seismic airgun explosion



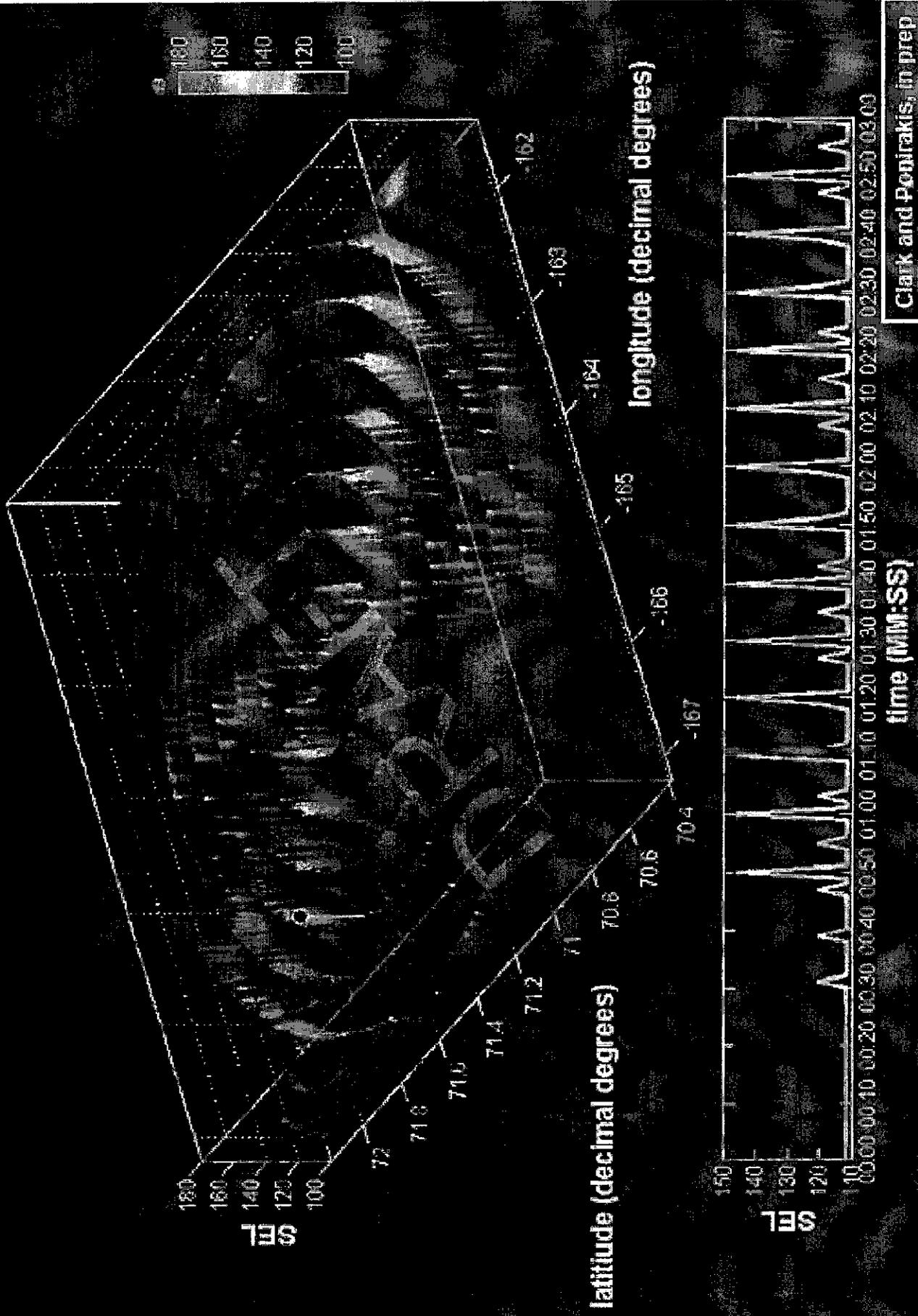
Large airgun arrays inject extremely high-pressure ( $> 250$  dB re  $1 \mu\text{Pa}$ ) acoustic impulses into the ocean

# Masking effects: modeling seismic



Omnidirectional sound energy levels from a single seismic airgun shot in Harrison Bay, North Slope, Alaska, integrated over 1 second

# Seismic acoustic "footprints" 71 sec after initial impulses



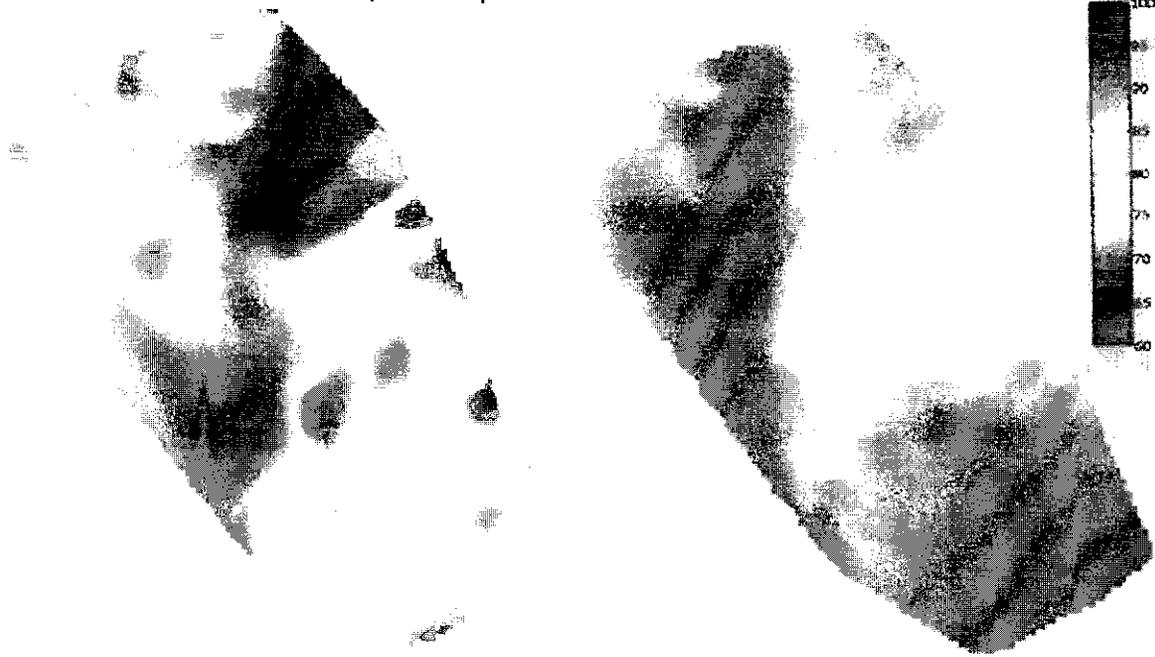
Clark and Popirakis, in prep

# Behavioral impacts: silencing and displacement

Fin Whale Singers

Seismic Airgun Acoustic Footprint

100,000 Sq. Mile Habitat



## Findings

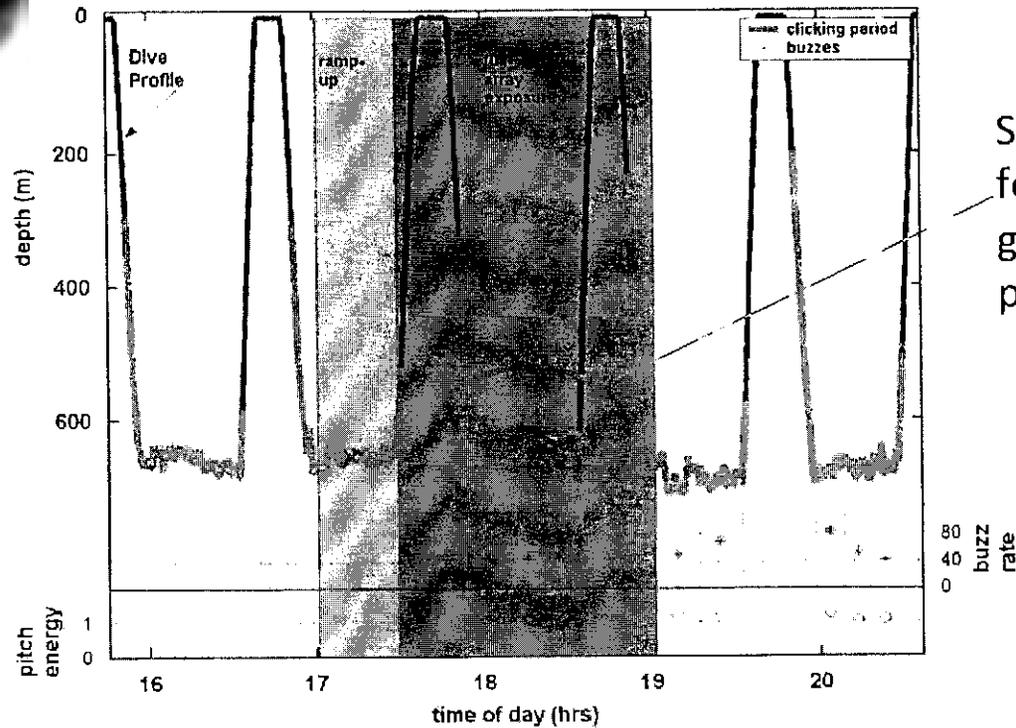
Humpback and fin whales generally fall silent within this area for the duration of shooting

The few male fin whales that continue to vocalize are displaced from the area

Any whale calls within the area are “masked”

Source: Chris Clark

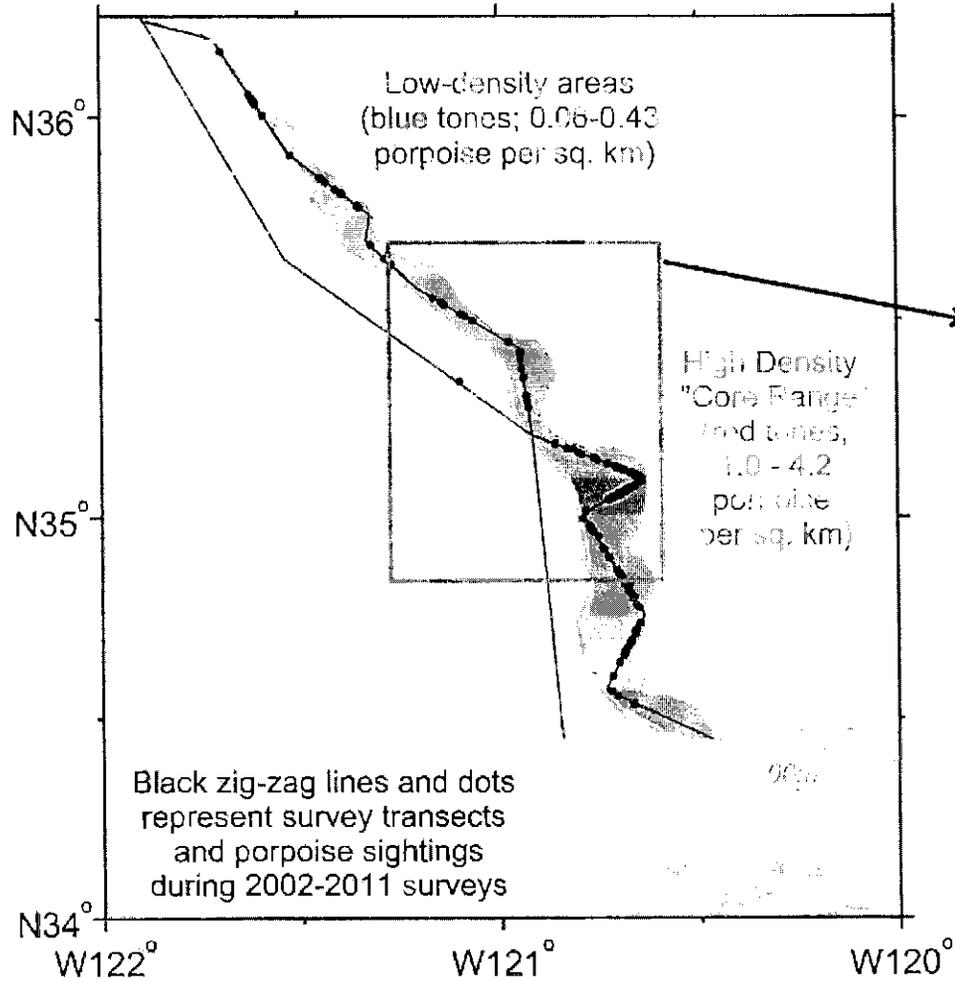
# Impacts on vital behavior: direct loss of foraging



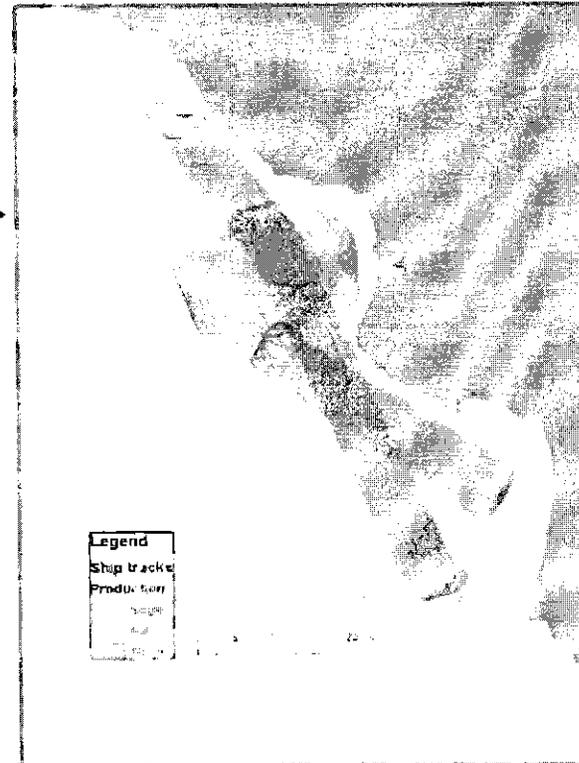
Sperm whale foraging dive: green dots denote prey capture noise

Prey capture decreased substantially (~20% on average) during seismic shooting, even at relatively low levels of exposure

Morro Bay Harbor Porpoise Stock  
 Range-wide density patterns  
 (darker colors indicate higher densities)



Proposed Seismic  
 Survey Tracks  
 and 160db Zone  
 (Draft EIS, Appendix H)



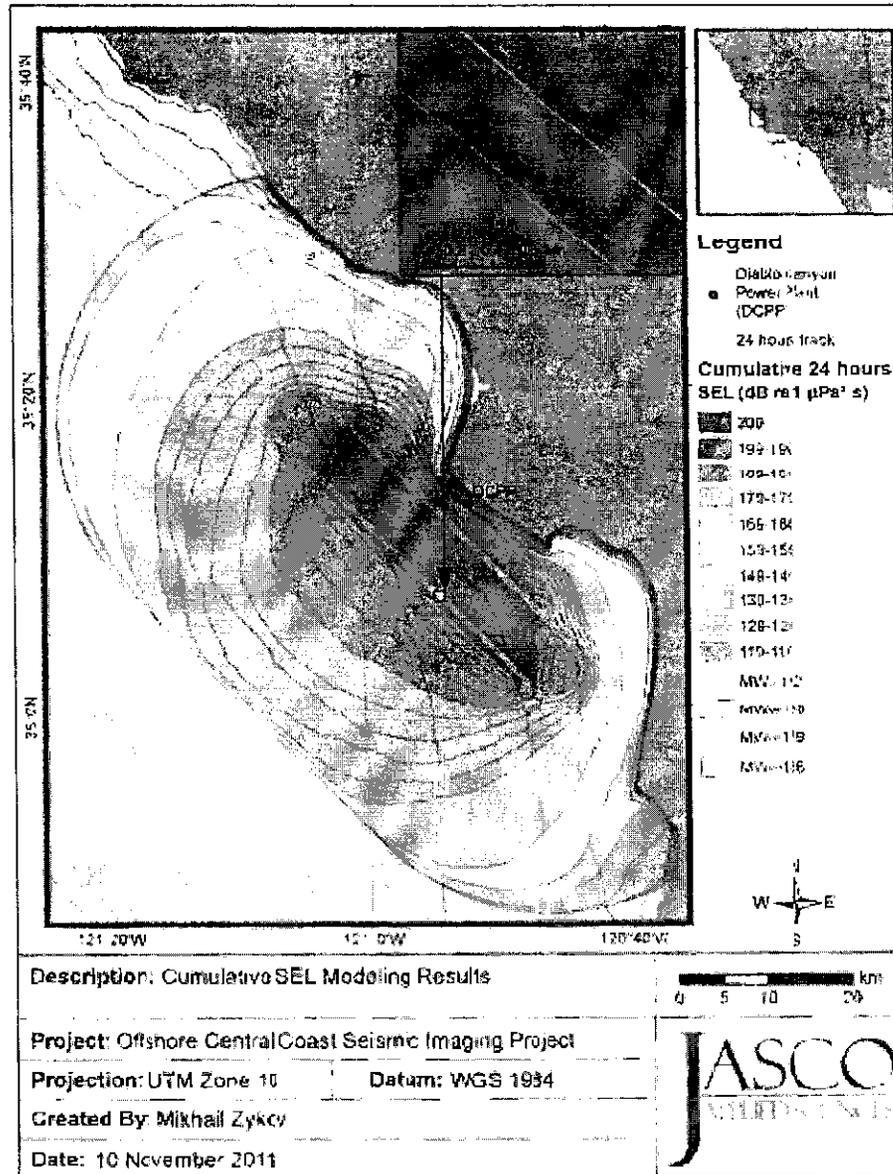
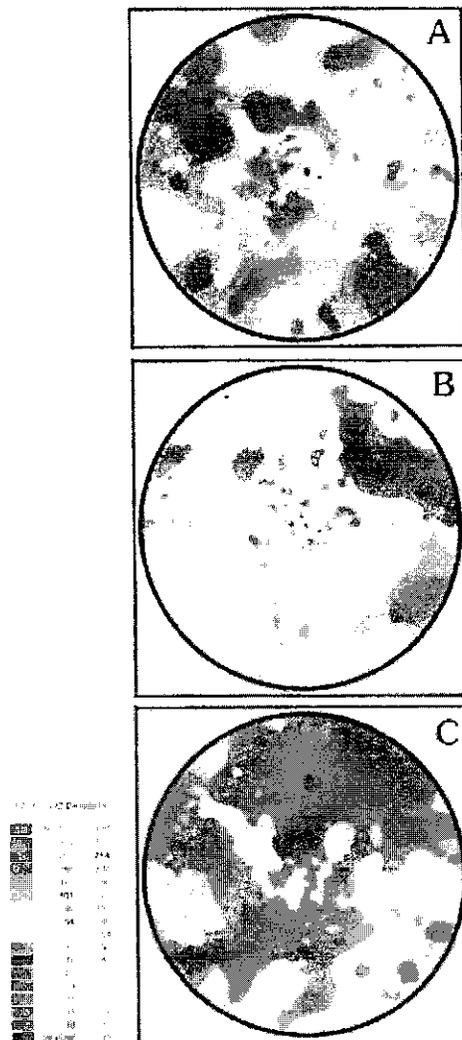


Figure 3.9 Cumulative SEL modeling results for Zone 2 showing contour lines for unweighted cumulative SEL as well as selected contours for different M-weighted marine mammal frequency group fields: 192 dB MW<sub>L</sub>, 198 dB MW<sub>M</sub>, 179 dB MW<sub>H</sub>, and 186 dB MW<sub>HP</sub>.

# Direct impacts on fisheries



Acoustic densities of cod and haddock

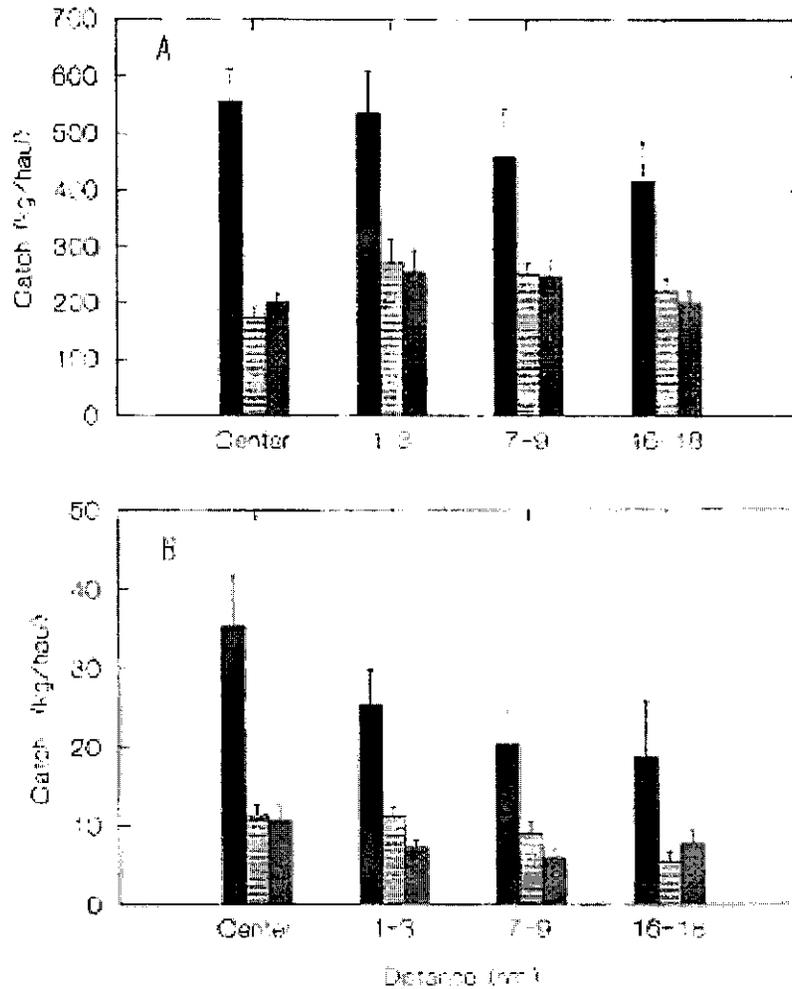
...before shooting

...during shooting

...and after shooting

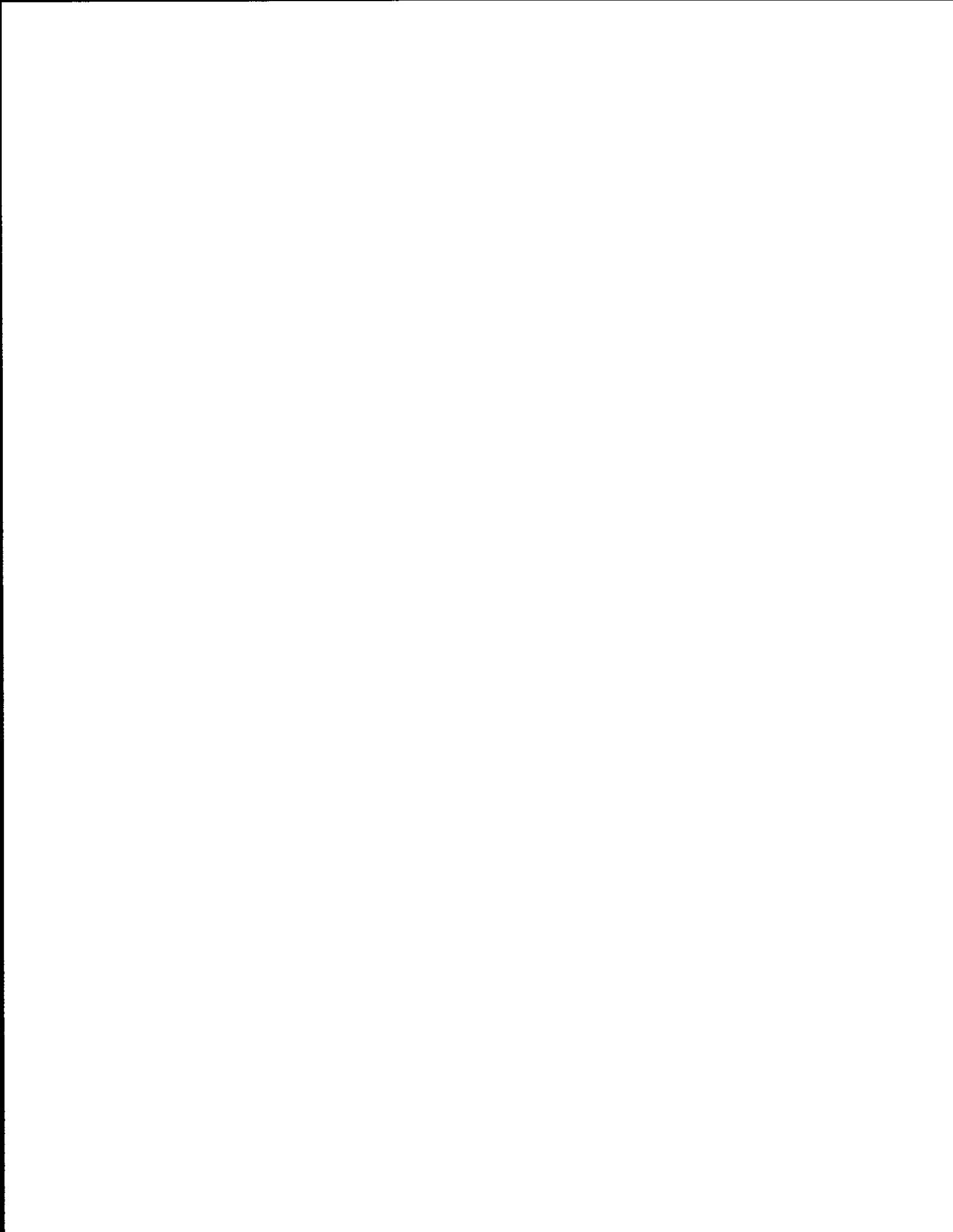
Diameter of study area was 40 nm, with the seismic survey at the center

## Direct impacts on fisheries



Average trawl catch rates of cod and haddock before (solid), during (striped), and after (gray) seismic shooting, by distance in nautical miles from the shooting area.

Source: Engas et al. 1996



California Coastal Commission  
Ex Parte Communication

Date and Time of Communication: 9/12/12, 7:30 A.M. Moody's Coffee shop  
Mendocino, California.

Project Description: Central Coastal California Seismic Imaging Project. Purpose; A brief review of PG&e's plans to request, a CDP permit and FCCD in order to perform 3D geophysical survey. The survey will be designed to determine the affects of possible faults on the Diablo Canyon Power Plant.

I, Commissioner Martha McClure had an ex parte communication with David Neish, David Neish Jr. and L. Jearl Strickland, P.E., director of Nuclear Project, PG&E. Mr. Neish and Mr. Strickland reviewed the attached briefing booklet. Both men advised me that this issue may be on the October Agenda.

Commissioner Martha McClure

 Date 9/19/12

**RECEIVED**

SEP 26 2012

CALIFORNIA  
COASTAL COMMISSION

**E-12-005**  
**PG&E SEISMIC SURVEY**

**APPLICANT:**  
**PACIFIC GAS & ELECTRIC Co.**



Mark Krausse  
Senior Director  
State Agency Relations

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Sacramento, CA 95814  
(916) 386-5709  
Fax: (916) 386-5720  
mark.krausse@pge.com

October 26, 2012

**RECEIVED**

OCT 26 2012

CALIFORNIA  
COASTAL COMMISSION  
NORTH CENTRAL COAST

Charles Lester, Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Dear Mr. Lester:

On behalf of Pacific Gas & Electric Company (PG&E), I would like to begin by thanking you and your staff for the many hours of work already undertaken in processing the application for our high-energy seismic survey (HESS) project. This survey was recommended by the California Energy Commission (CEC) in its report pursuant to Assembly Bill (AB) 1632 (Blakeslee, Chapter 722, Statutes of 2006), and subsequently required and funded by the California Public Utilities Commission (CPUC) in Decisions 10-08-003 and 12-09-008. The project received a fully certified environmental impact report (EIR) and related geophysical survey permit from the California State Lands Commission (CSLC) in August of this year.

As you know, the scope of PG&E's project has been reduced on two occasions since its inception. The first reduction was by the CSLC, which eliminated Box 3 to arrive at an environmentally preferred alternative – one that took the project from 41 to 33 days of sound source activity and reduced the project's proximity to the Monterey Bay National Marine Sanctuary and the White Rock and Cambria State Marine Conservation Areas. More recently, in an effort to take more of a pilot approach that might allow our work to begin this year, PG&E further reduced the scope from three boxes to one, reducing the number of days of seismic survey from 33 to 10, with a commensurate reduction in environmental impact. Survey Box 4, located in Estero Bay, is the most straightforward target for data acquisition. Running a series of 'dip' lines that are nearly perpendicular to expected structure will enable relatively straightforward 3D imaging of Hosgri, Los Osos and Shoreline fault zones and their intersections/interaction – a significant improvement to what is currently available using older data.

Our rationale for this reduction to less than a quarter of the original project is to prove both the appropriateness of the survey vessel and streamer array, and the robustness of our environmental mitigation and monitoring programs while minimizing potential environmental impacts and avoiding any Marine Protected Area (MPA). In addition to allowing us to demonstrate the technology and environmental protections built into the larger project, moving forward this year with the Box 4 survey will allow PG&E to determine whether it is

necessary to continue with survey Boxes 1 and 2 in 2013. For these reasons, and the reasons set forth in the analysis below, we urge the Commission staff to support issuance of a coastal development permit (CDP) and a finding of consistency with the federal Coastal Zone Management Act.

### **Why is PG&E Seeking to Permit the HESS Project?**

As mentioned briefly above, the CEC's legislatively mandated report, "Assessment of California's Operating Nuclear Plants,"<sup>1</sup> recommended that PG&E use three-dimensional (3D) geophysical seismic reflection mapping and other advanced techniques to explore fault zones near Diablo Canyon. The CEC found:

***The deep geometry of the faults that bound the San Luis-Pismo block, where DCPD sits is not well enough understood to rule out a San Simeon-type earthquake directly beneath the plant.*** It is necessary to better define the deep geometry of bounding faults of the San Luis-Pismo block and to better understand the lateral continuity of these fault zones. Although these fault zones are unlikely to replace the Hosgri Fault as the dominant source of seismic hazard at the plant, ***improved characterization of these fault zones would refine estimates of the ground motion that is likely to occur at different frequencies. This would be significant for future engineering vulnerability assessments.*** [Emphasis added]

...

***High quality three-dimensional geophysical seismic reflection mapping*** could resolve questions about the characterization of the Hosgri Fault and ***might change estimates of the seismic hazard at the plant.*** Similarly, direct imaging of the subsurface structure at Diablo Canyon could determine if faults exist near the site that do not break the surface and could also serve to refine the knowledge of the deep geometry, continuity, and interaction of poorly expressed faults that comprise the structural boundaries of the San Luis-Pismo block. [Emphasis added.]

These points are included in a list of 10 geophysical study targets identified by PG&E for the Central Coastal California Seismic Imaging Project (CCCSIP) and reviewed by the CPUC-convened Independent Peer Review Panel (IPRP). PG&E's current application for the Box 4 HESS project is a subset of the CCCSIP.

PG&E has had a great deal of success in conducting *onshore* seismic surveys in the area surrounding DCPD and the Irish Hills (part of the San Luis-Pismo block) without adverse environmental or cultural impacts. Here, low-energy (Accelerated Weight Drop) and high-energy (Vibroseis) surveys are being used to provide high-resolution images of fault structures at depth and correlate them with surface geologic features. These studies are

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<sup>1</sup> California Energy Commission, 2008, "An Assessment of California's Nuclear Power Plants: AB1632 Report," CEC-100-2008-009-CMF, 42 pp.

being used to constrain the *onshore* geometry (e.g. length, dip, width) of the faults that bound the San Luis-Pismo block.

Offshore, PG&E has already conducted three high-resolution, low-energy (< 2 kilojoule) 3D seismic surveys as part of its studies pursuant to the CEC's recommendations under AB 1632. These are similar in resolution and penetration to the onshore AWD surveys. These low-energy surveys have been instrumental in the identification of active faults and determining their rates of motion.

The proposed *offshore* HESS surveys represent the marine analog to the onshore Vibroseis surveys, allowing deeper penetration and improved imaging of not only deep-fault geometry, but the lateral continuity and connectivity of these fault zones. The low- and high-energy onshore and offshore seismic surveys will complement each other to provide an improved characterization of the geologic and tectonic setting of DCP. This imaging will allow PG&E to address the issues raised by both the CEC and the IPRP and better inform engineering vulnerability assessments.

Finally, the importance of the project has been underscored by letters of support from both the CPUC and the CPUC's IPRP. The CPUC's October 12<sup>th</sup> letter emphasized the importance of the Box 4 survey being performed on schedule in 2012. The IPRP's October 25, 2012 letter emphasized the consensus position that a Box 4 survey could provide valuable information about the faults that pose the greatest seismic hazard to the Diablo Canyon nuclear power plant.

### **Why Are PG&E's Existing Seismic Data Not Sufficient?**

For more than 30 years, PG&E has maintained a Long Term Seismic Program (LTSP) to study seismic issues and perform periodic seismic reviews of Diablo Canyon. This program, using state-of-the-art-technology, has yielded an impressive set of geologic and geophysical data that have enhanced our understanding of the Hosgri fault and other geologic features in the area.

State-of-the-art technology, however, continues to evolve. One example is the development of differential geographic positioning system (DGPS) navigation that has revolutionized PG&E's ability to perform high resolution surveys like the recent multibeam echo sounding and low energy PCable seismic reflection surveys offshore DCP. Another example is high energy marine seismic reflection data. The majority of high-energy seismic data that exist for the offshore areas of the southern Central Coast was collected during the 1970's and 1980's in support of oil exploration and is primarily two-dimensional (2D). While much of these data were evaluated as part of the original PG&E LTSP in the late 1980's, the majority of these surveys imaged targets outside of the area of immediate interest to PG&E.

Modern data collection and processing techniques, including 3D seismic, have been demonstrated to greatly improve imaging of complex geologic structures. Older data were

collected with widely-spaced hydrophone arrays that limit application of these modern processing techniques. While some of these new techniques have been applied to older data, many older data cannot be reprocessed due to differences in how these data were collected, the quality of the navigation, the hardware used, etc. Many of these older data are intrinsically 2D in nature and cannot be used to construct 3D images; dense spacing of 2D profiles cannot image 3D fault geometry correctly.

The state-of-the-art, high-energy 3D technology that PG&E is now seeking to employ with its HESS project will provide considerably more information about the deeper geometry of these faults, as well as their lateral continuity and connectivity with other fault zones. Finally, as explained earlier, PG&E was instructed by the CPUC to complete 3D studies pursuant to the recommendations of the CEC.

**As a Coastal-dependent Industrial Facility, Diablo Canyon's  
HESS Project Meets the Requirements of PRC Sec. 30260  
and Should be Granted a CDP**

Public Resources Code Section 30260 provides that a permit may be issued to a coastal-dependent industrial facility like PG&E's Diablo Canyon nuclear power plant even where it is not otherwise consistent with the Coastal Act if: 1) alternatives are infeasible or more environmentally damaging; 2) to do otherwise would adversely affect the public welfare; and 3) the environmental effects of the project are mitigated to the maximum extent feasible. PG&E's request for approval to proceed with surveys in Box 4 should be approved under these criteria for the following reasons:

**Box 4 is the Environmentally Preferred Alternative**

CSLC considered four alternatives in its full California Environmental Quality Act (CEQA) process: 1) the "no project" alternative; 2) a phased project that would be performed over two years; 3) a downscaled project (as mentioned earlier) eliminating one of the four proposed survey boxes; and 4) PG&E's 4-box survey as originally proposed. The CSLC selected alternative 3 as its environmentally preferred alternative, reducing the scope of the project to approximately three-quarters of the active days originally proposed.

PG&E's current proposal to do only Box 4 further reduces the project to one-quarter of its original duration, and avoids any work within the Point Buchan Marine Protected Area so as to further minimize any environmental impact. Box 4 was identified as the area with the least potential environmental impact due to lower harbor porpoise population densities.

This reduction to the shortest-duration box incorporates the 2-year phased approach urged by the Natural Resources Defense Council (NRDC), and also accommodates their position that the work be performed in the mid-November to mid-December timeframe. NRDC's rationale in seeking a 2-year, phased survey was that, if the results of the survey showed that the Franciscan Formation offshore of Diablo Canyon did not image well, or if other

results were not favorable, there would be time to learn that before proceeding with any further work. Those goals will be achieved in the Box 4 approach, in addition to the very real possibility that the answers gleaned from the Box 4 survey may render further high-energy work unnecessary. For example, a well-imaged Hosgri fault with no appreciable dip at depth towards the plant, combined with an imaged Shoreline fault with only minor stratigraphic offsets (along with no measured offset of Holocene aged channels in the low-energy P-cable 3D work) would likely allow PG&E to stop collecting additional high-energy seismic data.

### **Other Technology Choices are Infeasible**

One member of the CPUC's IPRP, San Luis Obispo County Supervisor Bruce Gibson, has raised concerns that PG&E's selection of an academic survey vessel with a 4-streamer array is not appropriate for the task. Geophysicists from the Scripps Institute of Oceanography and the University of Nevada, Reno, in addition to PG&E's Geosciences Department, have refuted that contention to the satisfaction of the members of the CSLC.

To the extent that the Coastal Commission staff still feels that Gibson's contention raises another potential and unanalyzed, environmentally preferred alternative – PG&E counters that while a wider 10-streamer array could reduce the number of survey lines, it is 3 times wider than the proposed array, it has a significantly larger turning radius (3500 m v 2500 m) and it is more cumbersome – having reduced maneuverability during line turns. The addition of six more streamers also increases the risk to smaller boats that might get entangled in the tow lines or the tail buoys, and would require the use of additional chase boats for monitoring and "traffic control," with commensurate increases in emissions and other environmental impacts.

With regard to the particular seismic data we are seeking to acquire, wide-swath geometry like Gibson's 10-streamer array produces poor seismic coverage at near offsets (or source-receiver ranges) that destroys the shallow portion of the seismic image. The shallow-most section is critical when linking very high-resolution imagery such as 3D PCable (low-energy) work with deeper HESS results. As PG&E and its contractors were able to convince CSLC members, the 4-streamer array is the right tool for this task.

### **Mitigated to the Fullest Extent Feasible**

Since mid-2012, PG&E has been working with state and federal resources agencies and with non-governmental organizations to identify the most robust suite of mitigation measures and to develop a monitoring program for mammals, fish, and other marine life. These include a 1.1-mile exclusion zone for specified marine mammals requiring PG&E to suspend operation until the mammal leaves that radius, weekly aerial monitoring (more stringent than the Commission's own HESS standards), ramp-up protocols for the air guns, and passive acoustical monitoring, to name just a few. A comprehensive list of mitigation requirements, in addition to monitoring programs exceeding \$8 million for the overall project, is attached to this letter.

In addition, PG&E has been meeting with fishing groups from Morro Bay and San Luis Bay in an effort to reach a global compensation agreement with them. In the absence of an agreement, or should an agreement be reached but one or more fishers have losses in excess of what they have received under a settlement, PG&E has a well-staffed claims department ready to assist applicants in receiving additional compensation. At the request of CSLC, PG&E has added a binding arbitration process for claims arising out of the HESS project to provide a neutral appeal forum for claimants who feel they have not been fairly or adequately compensated. Finally, at the request of Coastal staff, PG&E is also adding a community liaison for fishers and others to consult in order to better understand our claims process and ensure they are dealt with fairly.

**PG&E Urges a Staff Recommendation in Support of Box 4 Survey**

In closing, PG&E believes that its HESS project meets each of the criteria under PRC Section 30260, and urges the Coastal Commission staff to recommend in favor of issuance of a CDP and a finding of consistency in order that the Box 4 survey may be completed this year.

Sincerely,



Mark Krausse

Cc: Chairman Mary Shallenberger & Commissioners

# PG&E'S PROPOSED 3D HESS SURVEY MONITORING AND MITIGATION MEASURES

OCT 26 2012

## Selection of Box 4 for 2012

CALIFORNIA  
COASTAL COMMISSION  
NORTH CENTRAL COAST

The selection of Box 4 for the 2012 is a result of ongoing discussions with numerous permitting agencies and represents the portion of the proposed survey area with the least potential impacts to coastal resources. These include:

- Smallest survey area and shortest duration (9.25 days) of the currently CSLC approved survey boxes
- Lowest estimated take of marine mammals including Morro Bay harbor porpoise and southern sea otter
- November 15 to December 15 survey window has lowest impacts to fish eggs and larvae
- November 15 to December 15 survey window has lowest impacts commercial and recreational fishing in project area
- Includes both deep water and near-shore areas with the smallest percentage of shallow areas within three CSLC approved survey boxes
- Smallest survey footprint on hard-bottom substrate
- Survey lines do not enter any Marine Protected Areas

In addition to the factors outlined above, the PG&E 3D seismic survey will be mitigated by one of the most extensive mitigation programs that have been developed in support of an offshore 3D seismic survey. The following outlines some of the key measures included in this program.

## OVERALL MITIGATION PROGRAM

### Air Quality Impacts

Air emissions will be reduced through implementation of San Luis Obispo County Air Pollution Control District (APCD) Standard Mitigation Measures for Construction including;

- Implementation of Best Available Control Technology (BACT) Measures.
- Implementation of Fugitive Dust Controls.
- Prepare a Project-Specific Emission Reduction Program.

### Marine Biological Impacts

**Survey Timing.** To be less disruptive to migrating and summer season whales, the survey was originally proposed to be timed to occur during the months of September through December. This timing has been refined to November 15 to December 15 to further reduce potential impacts to local resources.

**Establishment of Safety Zone and Exclusion Zone.** PG&E used acoustic models to predict sound levels associated with the air gun array, and this information was used to establish both a Safety Zone (the distance from the air gun array at which noise levels are >160 dB re 1  $\mu$ Pa) and an Exclusion Zone (the distance from the air gun array at which noise levels are >180 dB re 1  $\mu$ Pa) in marine waters around the air guns. **Augmented by: Increase Size of Exclusion Zone During Surveys.** Per the requirements of the CSLC EIR, Pacific Gas & Electric Company will increase the size of the Exclusion

Zone for the full air gun array to 1.1 miles (2 kilometers) for baleen whales (mysticetes), whose hearing sensitivity overlaps the greatest with seismic air gun signals; sperm whales; and large groups of marine mammals (i.e., porpoises). Responses to such observations will be as described under APM-7 (reduce speed to avoid).

**Real-Time Sound Measurements/ Exclusion Zone Adjustments.** An acoustics contractor will perform real-time, direct underwater sound measurements during air gun deployment; these data will be used to verify and adjust the Exclusion Zone distances, as needed.

**Use of Ramp Up Process.** To warn marine wildlife in the vicinity of the air guns and provide time for them to leave the area and avoid potential injury or hearing impairment, at the start of air gun operations (after a period of no operation), the seismic operator will start off with low sound levels and gradually increase them (ramp up). **Augmented by: Increase Pre-Ramp-Up Scan Period.** Per the requirements of the CSLC EIR, Pacific Gas & Electric Company will increase the pre-ramp-up scan period to 45 minutes, especially in poor sighting conditions.

**Air Gun Operation During Turns and Transects.** During turns or brief transits between seismic transects, the seismic operator will continue firing a single air gun, to avoid periods of silence when marine wildlife could otherwise attempt to migrate into the Exclusion Zone.

**Aerial Surveys to Identify Presence of Marine Mammals.** PG&E will conduct aerial surveys prior to, during and following the survey operations. **Augmented by: Expand Pre-Survey to 8.6 Miles (14 Kilometers) and Perform 10 Days in Advance of Survey.** Per the requirements of the CSLC EIR, PG&E will conduct a pre-survey of the Project area and vicinity to 8.6 miles (14 kilometers) (twice the maximum 160-decibel re 1  $\mu$ Pa root mean square isopleth) for mysticetes (baleen whales), approximately 10 days prior to the start of the survey to allow for analysis of data obtained during the pre-survey and to make adjustments to the survey schedule as needed.

Aerial survey efforts will be further expanded to include direct coordination with the NMFS and FWS to conduct lower altitude surveys for Morro Bay harbor porpoise and sea otters as part of the NMFS lead expanded Adaptive Management Plan and Stranding Management Plan.

**Marine Species Protocols.** PG&E will prepare protocols to be implemented by all Project-related vessels for non-survey transit for the entirety of the Project.

**Use of Marine Mammal Monitors During Surveys.** Qualified Marine Mammal Observers (MMOs) will be onboard the primary seismic vessel whenever the air guns are firing during daylight, and during the 30-minute periods prior to ramp-ups, as well as during ramp-ups. Their role will be to watch for and identify marine mammals; record their numbers, distances, and reactions to the survey operations; and document observations. A scout vessel with qualified MMOs will traverse the Exclusion Zone to monitor marine wildlife within the survey area and report to primary vessel operator if any animals are observed. **Augmented by two additional mitigations: Required Marine Mammal Observer Qualifications, Use of Equipment and Procedures to Enhance Detection Rates, and Performance of Nighttime Monitoring.** The Marine Mammal Observers (MMOs) used for the Project will be independent and demonstrated to have had considerable experience sighting local species and using Passive Acoustic Monitoring. Appropriate equipment/procedures will be used to improve daytime detection rates (including big-eye binoculars, sufficient numbers of MMOs, and required rest periods). Monitoring will be performed during the nighttime using Passive Acoustic Monitoring that may be supplemented by

equipment to enhance night detection rates (including advanced infrared equipment, sodium lighting, and/or millimeter waves radar).

**Monitoring Using Two Scout Boats with Marine Mammal Observers During Surveys.** A total of two scout boats with MMOs will be used to increase detection rates within the Exclusion Zone. These boats will maintain a distance of half the Exclusion Zone on either side of the survey vessel. There will be a minimum of three MMOs assigned to each vessel (survey vessel and two scout boats), with two MMOs on watch at a time. The third would rest and then rotate with other MMOs to enhance vigilance during watch times.

**Use of Passive Acoustic Monitoring.** Passive Acoustic Monitoring (PAM) will be available to supplement visual monitoring in conditions of poor visibility or low lighting. When a vocalization is detected while visual observations are in progress, the acoustic Marine Mammal Observer (MMO) will contact the visual MMO immediately, to alert him/her to the presence of cetaceans (if they have not already been seen), and, if necessary, to allow a power down or shut down to be initiated.

**Avoidance of Pinniped Haul-Outs.** Pacific Gas & Electric Company will establish a flight plan for the aerial surveys that includes plans to avoid local pinniped haul-outs or to maintain sufficient altitude (greater than 500 feet [152 meters] above sea level) when passing local pinniped haulouts.

**Perform Track Lines with Highest Mammal Densities During Daylight Hours.** To the extent feasible, Pacific Gas & Electric Company will perform the inshore tracks of the seismic survey to coincide with daylight hours. In addition, Pacific Gas & Electric Company will conduct surveys near Church Rock (North 35° 20.675 West 120° 59.049) during daylight hours to the extent possible.

**Adaptive Management in Case of Multiple Shutdowns.** If more than three shutdowns occur for mysticete whales observed in the Exclusion Zone, PG&E will initiate an immediate project review in consultation with the California State Lands Commission and the National Marine Fisheries Service to assess the safety of Project area conditions.

**Contingency for Sighting of North Pacific Right Whale.** PG&E will shut down air guns if a North Pacific right whale is sighted at any distance from the survey vessel.

### **Commercial and Recreational Fishing Impacts**

**Fishers Claims Program.** PG&E has established a claims process overseen by an independent ombudsman to address economic impacts to commercial fishers caused by the survey activities. These claims will be facilitated by the JOFLO (ombudsman) and will be based on documented losses associated with the survey activities.

**Survey Timing to Reduce Impacts to Fishing and Recreational Uses.** To be less disruptive to commercial and recreational fishing operations and other recreational uses, the survey will be timed to occur during the months of September through December. To reduce the overall Project duration, survey operations will be conducted 24 hours per day, 7 days per week (24/7).

### **Terrestrial Biological Impacts**

**Worker Environmental Awareness Training Program (WEAP).** A WEAP will be prepared and presented to all personnel at the beginning of the Project. The WEAP will discuss sensitive species and

habitat areas with the potential to occur in the seismic survey area, with an emphasis on special-status wildlife and plant species. The program will also explain the importance of avoiding disturbance and implementing measures to protect sensitive resources during Project activities.

#### **Biological Monitoring During Geophone Placement, Geophone Retrieval, and Survey Activities.**

A qualified biologist will be on site during the wireless nodal geophone placement and retrieval activities. These measures include:

- Pre-Activity Biological Survey
- Establishment of Exclusion Zones Around Active Owl Burrows.
- Kangaroo Rat Avoidance and Minimization Measures.
- Establishment of Exclusion Zones Around Morro Shoulderband Snails (MSS).
- Avoidance of Streams and Wetlands.
- Avoidance of Western Snowy Plover, California Least Tern, California Clapper Rail, and California Black Rail Nesting Habitats.
- Lighting Use During Nighttime Survey Activities.
- Ongoing Trash Removal.
- Limited Off-Road Vehicle Travel.
- Reduce Light Radiating from Survey Vessels.

#### **Cultural Resource Impacts**

**Cultural Resource Monitoring during Survey Activities.** Cultural resource specialists will survey the proposed receiver alignments before any Project-related activities begin. Cultural resource monitors will also accompany each field team during pre-activity surveys and during seismic survey operations in areas with potential for cultural resources.

#### **Additional Mitigation Measures**

**Community Communications Plan.** PG&E has developed an extensive Community Communication Plan designed to provide interested parties with up to date information on the survey activities. These communications will include an extensive outreach program to explain the purpose of the proposed survey, the anticipated areas where the survey is ongoing and ways to request additional information on the project. Particular attention will be focused on providing real-time information of the survey vessel location to offshore vessel operators including commercial and recreational fishers.

The following measures will be implemented to reduce potential impacts from the proposed project. These include:

- Brush Fire Prevention Procedures.
- Emergency Response Procedures.
- Issuance of Notices.
- Oil Spill Contingency Plan.
- Observation and Removal of Divers from Waters in Active Survey Area.
- Limit Weekend Hours of Operation.

#### **COMPREHENSIVE MONITORING PROGRAM**

## Developed in Consultation with Resource Agencies

In addition to those mitigation and monitoring programs developed by PG&E in support of the seismic survey project implementation (see below), PG&E has agreed to participate in a Comprehensive Monitoring Program. This program has been developed in consultation with numerous resource agencies and research groups including NMFS, USFWS, CDFD, The Nature Conservancy, Ocean Science Trust, Cal Poly San Luis Obispo, and Moss Landing Marine Laboratories. These programs are summarized below.

- **Harbor Porpoise Monitoring Program.** PG&E has agreed to fund a Harbor Porpoise Monitoring Program that will be conducted by the NMFS. The program involves a direct collaboration between NMFS, U.S. Geological Survey (USGS), Brandon Southall (SEA, Inc.), and possibly others. Monitoring would involve a 3-pronged approach to collect data before, during, and after the seismic surveys.
- **Sea Otter Monitoring Program.** PG&E has agreed to fund a Sea Otter Monitoring Program that will be conducted by the USFWS, CDFG Marine Wildlife Veterinary Care and Research Center (MWVCR), the Monterey Bay Aquarium Sea Otter Research and Conservation Department, and University of California and Santa Cruz and Davis. The monitoring program will provide a real-time monitoring infrastructure with which to detect and measure levels of harassment caused by the surveys, as required by the USFWS, while at the same time providing useful information on behavioral response thresholds as a function of sound exposure for sea otters. This program was initiated on October 2, 2012.
- **Stranding Response Plan.** PG&E has agreed to support a Stranding Response Plan developed by the NMFS, USFWS and CDFG. This plan will be implemented in close coordination with the Harbor Porpoise and Sea Otter Monitoring Programs. Data from the program will also be used in the evaluation of impacts under the Adaptive Management Program.
- **Aerial Survey Program.** NMFS will conduct aerial surveys in conjunction with the proposed seismic survey operations as outlined in the HESS Guidelines and in accordance with the requirements established by the CSLC FEIR mitigation measures (CSLC, 2012). In addition to these aerial surveys, NMFS/USFWS will be conducting low level aerial surveys designed to monitor southern sea otter and Morro Bay harbor porpoise movements in response to the seismic survey operations. Baseline aerial surveys will commence on October 2, 2012.
- **Adaptive Management Program.** Data generated during pre-activities surveys and ongoing operational monitoring activities will actively be used during the proposed seismic survey to adjust or redirect operations should significant adverse impacts be observed to marine resources in the project area. This program will rely on data generated during the Harbor Porpoise and Sea Otter Monitoring Programs along with vessel based PSO observations.
- **Monterey Bay National Marine Sanctuary HARPs Program.** PG&E has agreement to support the placement of two High Frequency Acoustic Recording Packages (HARPs) within the project area. These monitoring devices will record vocalizations of a broad range of marine mammals, including harbor porpoise and bottlenose dolphins. One HARP will be installed within the southern boundary of the Monterey Bay NMS while the second will be installed further offshore in San Luis Bay.

**Study of the Effects of the Seismic Survey on Fishes.** PG&E has agreed to fund a two-component study to examine the short- and long-term effects of the seismic survey on fish abundance (and

invertebrates). Components of the study include: (1) Remote Operated Vehicle (ROV) surveys to assess the abundance of common rockfishes and other demersal fish and invertebrate species in sites before, during, and after the seismic survey; and (2) funding the California Collaborative Fisheries Research Program (CCFRP), which is an existing program between the fishing communities of Half Moon Bay, Moss Landing/Monterey, Morro Bay, Port San Luis and the academic institutions of Moss Landing Marine Labs and Center for Coastal Marine Sciences at Cal Poly, San Luis Obispo to study the long-term effects of the HESS on fish abundance in shallower waters. The CCFRP involves both Catch per Unit Effort (CPUE) and Commercial Trap surveys.



**E-12-005**  
**PG&E SEISMIC SURVEY**

**FEDERAL/STATE AGENCIES**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Monterey Bay National Marine Sanctuary  
99 Pacific Street, Bldg 455a  
Monterey, CA 93940

November 1, 2012

Charles Lester  
Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Dear Charles,

The Monterey Bay National Marine Sanctuary Advisory Council recently requested that I send you a letter conveying the council's concerns with PG&E's proposed seismic surveys for the Diablo Canyon nuclear power plant. This issue was discussed at the October 18 SAC meeting in Cambria. The purpose of this letter is to convey Advisory Council concerns, and their desire for the Coastal Commission to consider these at its November 14 meeting.

As you may know, NOAA-National Marine Fisheries Service (NMFS) is currently reviewing PG&E's request for an IHA (Incidental Harassment Authorization) for impacts to protected species. In September of this year, Monterey Bay National Marine Sanctuary (MBNMS) articulated its concerns about potential impacts to sanctuary resources during the comment period for an EA prepared by the National Science Foundation. The project was subsequently moved out of sanctuary waters and further confined to a smaller area. MBNMS has since worked to help make sure that if an IHA is provided, certain monitoring and permit requirements would ensure that sound levels and impacts are carefully observed and reported and mitigated.

The Advisory Council voiced two major concerns with the proposed seismic survey project. First, the council was concerned overall with the potential harmful effects of high-decibel sound on marine organisms in sanctuary waters and those that would enter sanctuary waters from the active survey area. The council felt that there was insufficient information and analysis on the effects and threshold levels. The other concern was with regard to inadequate time to understand baseline conditions prior to the survey for appropriate monitoring.

Because the proposed survey is outside sanctuary waters, MBNMS has chosen to rely on NMFS, to help ensure that sanctuary resource protection is adequately addressed. Nevertheless, the Advisory Council remains concerned for sanctuary resources and feels that the surveys should be delayed until more is known about impacts and baseline conditions in and around the target survey area.

Thank you for the opportunity to pass along the concerns of the Advisory Council.

Sincerely,  
  
Paul Michel,  
Superintendent



**Office of National Marine Sanctuaries Comments**  
**NSF's Draft EA Marine Geophysical Surveys for Central California**  
**August 10, 2012**

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**Overview Comments**

Although the NSF Draft Environmental Assessment acknowledges the presence of Monterey Bay National Marine Sanctuary, ONMS is unable to determine the potential or likely impacts that may occur to sanctuary resources as a result of this project. The Office of National Marine Sanctuaries (ONMS), administered by the National Ocean Service within NOAA, is concerned that the state and federal environmental analyses have come to different conclusions as to whether or not the project will cause significant impacts. Due to the disparity in the environmental analysis, and in the absence of key information, MBNMS staff cannot adequately determine the likely impact to national marine sanctuary resources.

In order to adequately assess the impacts to Monterey Bay National Marine Sanctuary, ONMS requests that NSF increase its level of coordination with our office and provide additional environmental detail on the scope of the project, and the potential impacts that may occur within the boundary of MBNMS.

More specific comments include:

**State and Federal environmental analysis**

Currently, there are inconsistencies between the state and federal environmental analyses regarding the level of impact to marine mammals. If NSF believes the state analysis is flawed in reaching its conclusion of significant and unavoidable impacts, or if there is additional information that has become available after the NSF Draft EA was released, the final or supplemental environmental analyses will need to explain these differences.

**Operations within the National Marine Sanctuary**

The Draft EA indicates that the R/V *Marcus G. Langseth* will be operating within MBNMS only when the vessel makes turns. However the sound and potential impact may travel into the sanctuary. Unfortunately, the Draft EA does not address the distance from the sound-source to the sanctuary, how far and at what magnitude these acoustic pulses will travel, and what will be the acoustic profile within the sanctuary from this project. Clear information is needed on the attenuation level, sonification, decibel levels, possible shock wave attenuation, and other relevant acoustic information. In addition, detail is lacking with regard to transects, e.g., when transects will be completed, at what distance from the boundary of Monterey Bay National Marine Sanctuary.

**Possible impacts to Sanctuary resources**

The Draft EA does not assess impacts to MBNMS resources in a meaningful way. For example, the impact profile in the Draft EA does not comport with the "significant and unavoidable" impacts to harbor porpoise, sea otters and dolphins that were outlined in the state Final EIR. It may be necessary to reduce the size and scope of the project to ensure negative impacts related to

sound are kept beyond the borders of the MBNMS. This critical acoustic data noted above is essential to help NSF, the applicant and ONMS to determine if a broader exclusion area is needed.

**Consultation under the NMSA**

Federal coordination and consultation under the National Marine Sanctuaries Act Section 304(d) is required for federal agency actions internal or external to a national marine sanctuary for activities that "are likely to destroy, cause the loss of, or injure any sanctuary resource". At present, we are unable to determine if such formal consultation is required without further information as requested above.

**National Marine Fisheries Service Southwest Region Comments  
NSF's Draft EA Marine Geophysical Surveys for Central California  
August 10, 2012**

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The proposed project is of concern to NMFS because various fish species, essential fish habitat, endangered species, and protected marine mammals, for which NMFS has management or consultation responsibilities under federal statutes, are present within the project area. NMFS offers the following general comments on potential impacts to these resources. NMFS would like to continue to assist the National Science Foundation with developing more detailed analysis of the potential impacts to these resources.

**Magnuson-Stevens Fishery Conservation and Management Act Comments**

NMFS is concerned that fishing restrictions during the survey period would harm the economic interests of commercial and recreational fishermen and supporting industries operating out of Morro Bay and the Port of San Luis. The proposed action may displace fishing activities to surrounding areas. NSF needs to analyze where this displacement may occur and whether this would create a safety issue for vessels further from their home ports. The Draft EA does not include recreational fisheries data necessary to evaluate economic impacts on local recreational fisheries. There is also concern about the potential short and long term biological impacts on commercially and recreationally important fish species, as well as the potential long-term economic effects to the commercial and recreational fisheries of changes in species abundance. NMFS is concerned about how the proposed action will affect rockfish courtship behavior, which occurs predominantly in the fall, and thus how it might affect larval recruitment in the spring. NMFS is also concerned about the potential for the proposed action to result in increased interactions between the drift gillnet fishery and marine mammals and sea turtles. In order to avoid the noise emitted from the air guns, these animals may move farther offshore than normal and into the area where drift gillnets are routinely placed.

*Essential Fish Habitat*

NMFS concurs with the Draft EA's conclusion that essential fish habitat (EFH) would not be permanently impacted by the proposed project. NMFS believes the proposed project would have temporary adverse effects on EFH for various species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Pacific Salmon Fishery Management Plans. The placement of geophones may impact rocky reef, kelp canopy, and seagrass habitats via direct benthic disturbance. However, given the limited spatial extent and linear arrangement of the geophones, any benthic impacts are expected to be temporary and minimal. The acoustic energy generated from seismic testing will temporarily reduce the quality of EFH via increased noise. Potential noise impacts to fishes from the seismic surveys may include mortality, permanent or temporary hearing damage, temporary hearing threshold shifts, and difficulty finding prey or avoiding

predators. However, given the Draft EA's limited quantification of noise impacts to fishes, it is difficult to determine the magnitude of this impact. NMFS believes the Draft EA would benefit by a more robust analysis and/or modeling effort. A more refined impact estimate could be used to determine whether mitigation is appropriate to compensate for impacts to fish populations.

### **Marine Mammal Protection Act Comments**

NMFS is concerned with potential impacts to marine mammals and how the baseline conditions and impacts were evaluated, and consequently how this translates into potential take as defined under the Marine Mammal Protection Act. The density estimates for many of the marine mammal species should be recalculated since the minimum population estimate ( $N_{min}$ ) was used and may not be appropriate for estimating the level of take, particularly for species like the harbor porpoise (*Phocoena phocoena*). NMFS also recommends that NSF provide justification as to why certain marine mammal species were not included in their analysis while similar species with similar distributions were considered. If take for gray whales is not anticipated nor requested, NMFS recommends that the applicant keep in close communication with NMFS to determine the start of the gray whale migration. NMFS is concerned about the proposed mitigation measures and the effectiveness of these measures for a 24/7 operation as a means to minimize impacts to marine mammals. It appears that different models were used for similar NSF-sponsored seismic surveys. It would be helpful to understand the rationale for adopting one model over the other.

NMFS appreciates the opportunity to provide input to NSF on this important project and we look forward to continuing to work with NSF. If you have any questions please contact Ms. Shelby Mendez at [Shelby.L.Mendez@noaa.gov](mailto:Shelby.L.Mendez@noaa.gov) or 562-980-4094.

**MEMORANDUM FOR: Monterey Bay National Marine Sanctuary Advisory Council**

**FROM: Paul Michel, Superintendent**

**SUBJECT: Proposed PG&E Seismic Survey Project**

In preparation for the October 18 SAC meeting in Cambria and the agenda item regarding the proposed PG&E Seismic Surveys, I have prepared the following summary for your information.

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PG&E and the National Science Foundation (NSF) are proposing to conduct a high energy seismic survey in the vicinity of the Diablo Canyon power plant and known offshore fault zones. PG&E's seismic research was called for by the state and includes the use of on-shore and off-shore low and high-energy seismic studies, as well as the installation of ocean-bottom sensors to detect seismic activity. The data will provide a more accurate and detailed picture of the region's complex geology, and will help further define the level of seismic activity in the region of Diablo Canyon. PG&E will use this data to support its ongoing seismic safety program.

NOAA is reviewing federal and state environmental documents regarding potential biological impacts from marine seismic tests on whales and other federally protected species. The agency will determine if the project can be conducted in a manner compliant with federal natural resource protection laws, which include the Marine Mammal Protection Act, the Endangered Species Act, the Magnuson Stevens Fisheries Act, and the National Marine Sanctuaries Act. The proposed survey would occur south of the boundary of the Monterey Bay National Marine Sanctuary and models used to estimate potential impacts to marine life predict that the intensity of sound reaching the southern boundary of the sanctuary would likely not be high enough to affect sanctuary resources, based on threshold values used by NOAA. However, levels within the sanctuary are predicted to approach these thresholds, leading to interest in validation of model predictions and in comprehensive monitoring of sound levels and marine mammal distributions and densities before, during and after the survey.

The National Science Foundation (NSF), which prepared the NEPA document and plans to carry out the surveys using their research vessel (in partnership with PG&E), has committed to complete a "source verification phase" prior to beginning the survey. This phase is designed to measure the actual level of underwater ensonification that occurs to determine whether these values match those predicted by models. This will help determine whether predictions that sanctuary resources are unlikely to be affected by the survey are accurate.

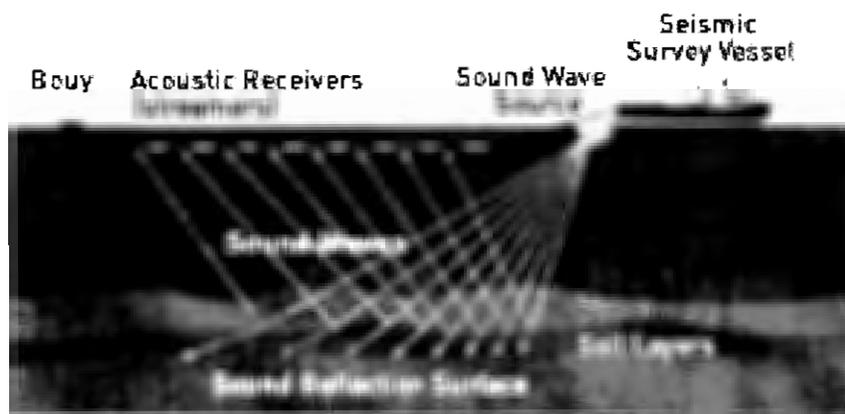
Regardless of the outcome of this verification phase, NOAA has asserted that should the proposed project go forward, the need for impacts analysis to sanctuary resources be addressed within the comprehensive mitigation and monitoring plans funded by PG&E. As the sanctuary's concerns relate to the impacts of sound on marine mammal and fish species, they overlap with NOAA Fisheries' concerns and thus several line offices within NOAA have worked collectively to identify and recommend appropriate mitigation and monitoring. These plans include fishery resource assessments south of the sanctuary, shoreline stranding response spanning the survey area and inclusive of the southern sanctuary, aerial survey efforts targeting both large whales and smaller coastal populations (sea otters and harbor porpoises), and "listening" based monitoring which uses three types of passive acoustic technologies. Two forms of passive acoustic monitoring will focus mainly on monitoring the behavior of inshore populations of concern, sea otters and harbor porpoises in particular, south of the sanctuary and central to the seismic survey area. However, one listening station for these systems will be placed in the southern sanctuary. A final form of passive acoustic monitoring will focus on the offshore levels of sound from the seismic surveys and detection of large whales in the sanctuary, with an additional listening station further south.

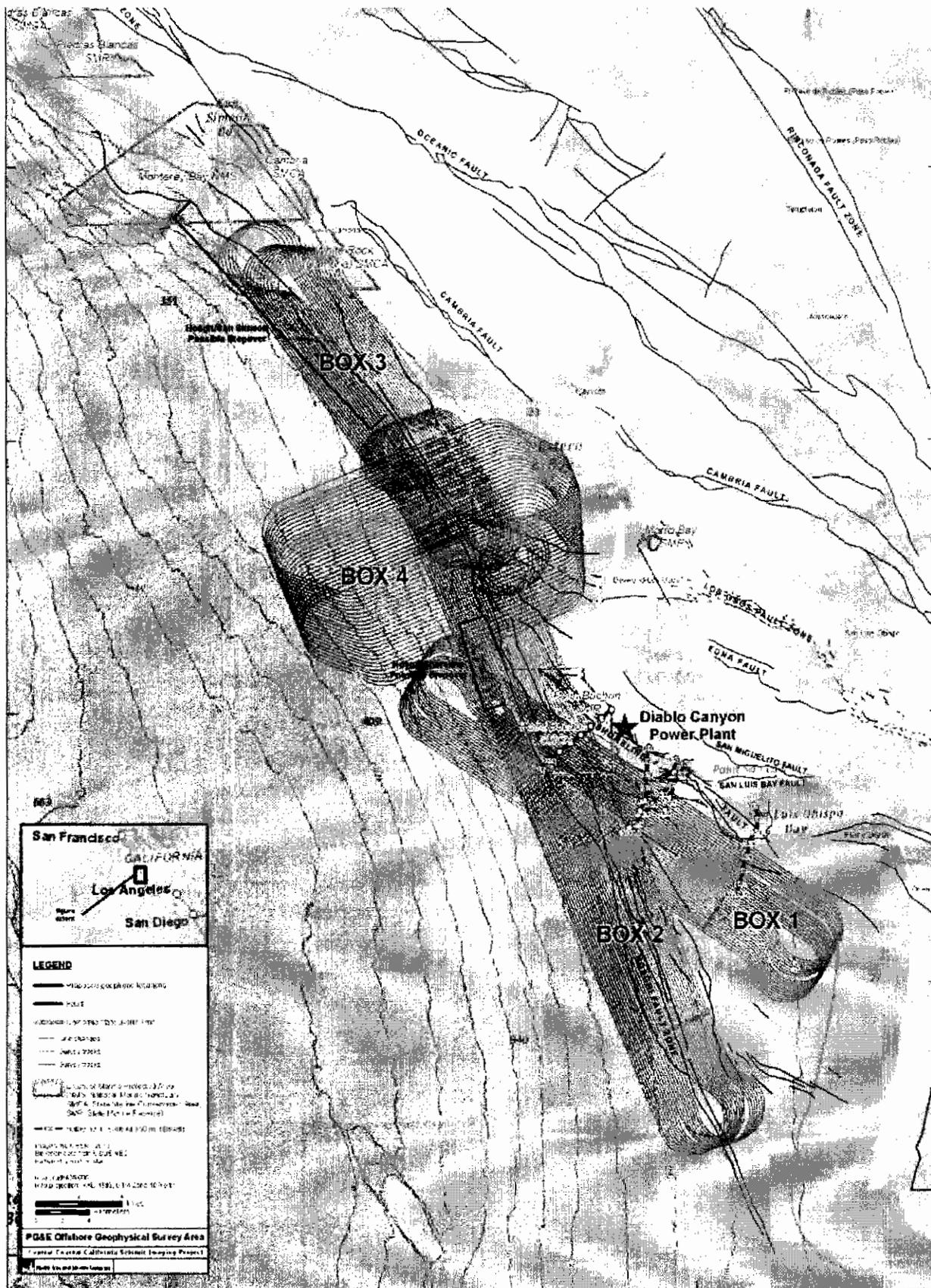
Currently, PG&E is seeking approval from the California Coastal Commission for its revised seismic survey focused on the area referred to as "Box #4" (PG&E had planned to conduct testing this fall in two of the four "boxes" or zones outlined on the project map. Now it only plans to survey Box 4 off the coast of Morro Bay, postponing the testing in Box 2, which ranges from Morro Bay to northern Santa Barbara County).

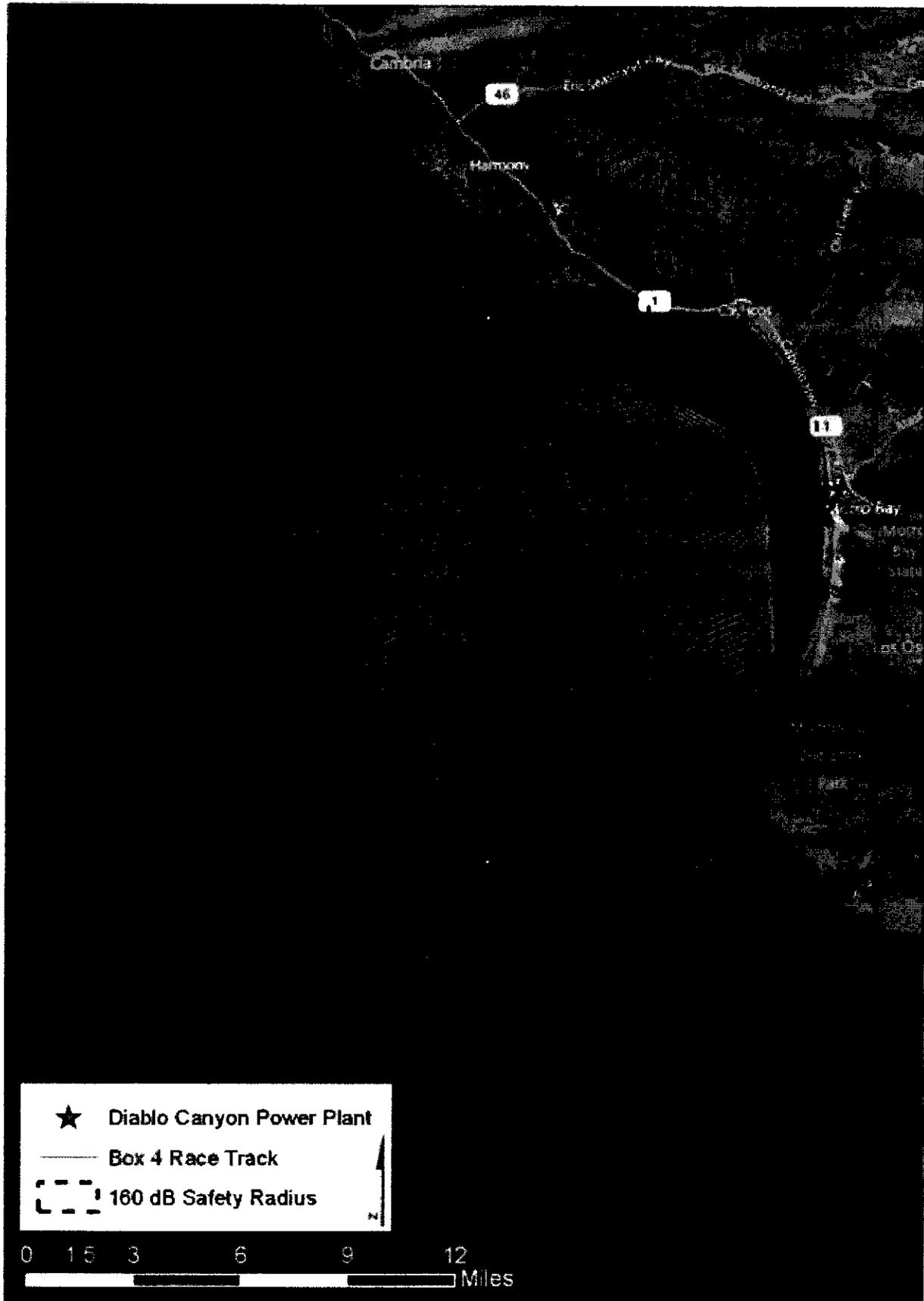
The Commission intends to consider this item at its November 14 meeting in Santa Monica. The utility company had planned to begin seismic testing offshore of Diablo Canyon nuclear power plant in early November, but now it must wait until the conclusion of its mid-November hearing before the Coastal Commission — if the permit application is approved.

PG&E also is seeking a permit from NMFS.

### Seismic Survey Process









**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Region  
501 West Ocean Boulevard, Suite 4200  
Long Beach, California 90802-4213

Holly Smith  
National Science Foundation  
Division of Ocean Sciences  
4201 Wilson Blvd., Room 725  
Arlington, VA 22230

AUG 10 2012

Dear Ms. Smith,

NOAA's National Marine Fisheries Service (NMFS) and National Ocean Service (NOS) appreciate the opportunity to comment on the National Science Foundation (NSF) Draft Environmental Assessment (EA) of Marine Geophysical Surveys by the R/V *Marcus G. Langseth* for the Central California Seismic Imaging Project. The proposed action is to conduct a high energy seismic survey in the vicinity of the Diablo Canyon Power Plant and offshore fault zones.

NOAA understands and appreciates the benefits that could come from improved scientific knowledge of major geologic structures and fault zones in the vicinity of Diablo Canyon. We believe this project and our regulatory review would benefit from a more thorough NEPA analysis and we want to work closely with NSF to help improve the EA to better address potential impacts to living marine resources and marine habitats.

In our future work with you we would like to focus on potential impacts to marine mammals and suggestions for improving the analysis of these impacts and ideas to mitigate potential impacts.

In addition, the EA should be revised to improve the analysis of potential impacts to commercial and recreational fisheries and fishery resources including Essential Fish Habitat. We also suggest including a summary of the Endangered Species Act Section 7 consultation process for all species under NMFS jurisdiction. Lastly, we suggest that additional information should be included to characterize the spatial extent of the seismic survey sound field relative to Monterey Bay National Marine Sanctuary which is located in the northern end of the proposed action area, and the extent of activities that would take place in the sanctuary.

We have attached more specific comments from NOS and NMFS.

Thank you for the opportunity to provide input to NSF on this important project and we look



forward to continuing to work with you. If you have any questions for NMFS please contact Ms. Shelby Mendez at [shelby.l.mendez@noaa.gov](mailto:shelby.l.mendez@noaa.gov) or 562-980-4094, and if you have any questions for NOS and Monterey Bay National Marine Sanctuary please contact Ms. Deirdre Whalen at [deirdre.whalen@noaa.gov](mailto:deirdre.whalen@noaa.gov) or 831-647-4207.

Sincerely,



Rodney R. McInnis  
Southwest Regional Administrator  
National Marine Fisheries Service



for

William J. Douros  
West Coast Regional Director  
Office of National Marine Sanctuaries



October 1, 2012

Charles Lester  
Executive Director  
California Coastal Commission  
45 Fremont Street Suite 2000  
San Francisco, CA 94105-2219

Dear Dr. Lester,

I am writing you today to express the Estuary Program's concern regarding the potential impacts to the marine ecosystem and local fisheries of the Central Coast from the offshore seismic surveys proposed by PG&E and NSF. Noise in the marine environment at the levels projected can have severe short-term impacts on many species and unknown long-term impacts.

Our pristine natural environment along the Central Coast is important to both people and wildlife. The survey will impact a number of marine species, including marine mammals and commercially important fish. Here in the Central Coast, fishermen, community representatives, and conservation groups have been working arm-in-arm to transition the local fishery to one of greater environmental and economic sustainability. In fact, the City of Morro Bay just won the Walter B. Jones Award for Excellence in Local Government (an award under the Coastal Zone Management Act recognizing excellence in coastal management) for their efforts. The seismic survey as currently proposed could undermine the progress the community has made in building a viable, sustainable fishery by harming the natural resources both inside and outside of MPAs that the fishermen depend upon for their livelihood.

I am pleased to see that PG&E is working with the Coastal Commission and conservation groups to amend the project to address concerns, but more work should be done to minimize both environmental and economic impacts from such testing. The Estuary Program hopes that the federal and state agencies reviewing the project take time to weigh the benefits and risks of this testing; assess whether alternative, less-impactful methods are available to determine the potential vulnerabilities to Diablo Canyon Nuclear Power Plant from seismic activity; require safeguards to minimize impacts to the marine environment and local economy; and put in place fair and equitable mitigation measures to help address economic losses to the coastal community and local fishery.

Sincerely,

A handwritten signature in black ink, appearing to read "Adrienne Harris". The signature is fluid and cursive, with a long, sweeping tail that extends to the right.

Adrienne Harris  
Executive Director

cc: Congresswoman Lois Capps; State Senator Sam Blakeslee; Assemblyman Katcho Achadjian



State Of California

ALFRED E. ALQUIST  
SEISMIC SAFETY COMMISSION



Governor Edmund G. Brown Jr.

October 30, 2012

Mary Shallenberger, Chair  
California Coastal Commission Commissioners  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: Alfred E. Alquist Seismic Safety Commission Support for PG&E's Offshore High Energy Seismic Survey

Dear Chair Shallenberger and Commissioners:

I am writing to express the Alfred E. Alquist Seismic Safety Commission's (Commission) support of PG&E's application to conduct a high energy offshore geophysical survey within Box 4 located in Estero Bay near the Diablo Canyon Nuclear Power Plant.

The Commission is a participant in the California Public Utility Commission's Independent Peer Review Panel (IPRP). The IPRP has identified Box 4 as one of three offshore areas that contain known faults and fault intersections of key importance in evaluating seismic risk at Diablo Canyon. High quality 3D geophysical seismic reflection mapping could also identify previously unknown faults that were not identified by older surveys conducted with less advanced technology many years ago.

The Mission of the Commission is to reduce the seismic risk to all Californians. In addition, to being an IPRP member, the Commission was a participant in carrying out the requirements of AB 1632 which called for PG&E to use advanced seismic studies, including high energy 3D surveys. The Commission believes the current proposal to conduct 9.25 days of high energy surveys will demonstrate the capabilities of the survey vessel which is scheduled to conduct similar studies offshore of Diablo Canyon next year, and for the San Onofre Nuclear Generating Station in Southern California. The proposed study will also demonstrate the quality of the data generated and allow review of how those data are interpreted. Beginning the studies in a single area will allow lessons learned to be applied to other areas scheduled to be studied during 2013.

Finally, the proposed project will assist the IPRP in advising the California Public Utilities Commission on how new information may help them make important decisions regarding the Diablo Canyon Nuclear Power Plant.

Again, the Commission respectfully requests that the California Coastal Commission grant a permit to PG&E to conduct these important tests within Box 4 before the end of the current calendar year.

Respectfully,

Mike Gardner  
Chair

CC: Steve Blank  
Dayna Bochco  
Dr. William A. Burke  
Wendy Mitchell  
Jana Zimmer  
Martha McClure  
Steve Kinsey  
Mark W. Stone  
Brian Brennan  
Richard Bloom  
Esther Sanchez  
John Laird or Janelle Beland  
Curtis Fossum or Cy Oggins  
Jay Norvell  
Mark Johnsson  
Cassidy Teufel  
Tom Luster  
Anna Caballero  
Eric Green  
Chris Wills  
Raul DeLaRosa

**CALIFORNIA ENERGY COMMISSION**

ROBERT WEISENMILLER, CHAIR

1516 NINTH STREET, MS 33  
SACRAMENTO, CA 95814-5512  
(916) 654-5036  
FAX (916) 653-9040

October 26, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105**RE: Pacific Gas and Electric Company (PG&E) Three-Dimensional (3-D) Seismic Reflection Mapping near Diablo Canyon**

Dear Chair Shallenberger:

The safety and reliability of Diablo Canyon Power Plant (DCPP) is of critical importance to California and the state's overall electricity supply. The potential vulnerability of DCPP to a major disruption from a major seismic event cannot be ignored. The importance of undertaking a thorough analysis of risks to DCPP reliability is underscored by implications of the current unavailability of the San Onofre Nuclear Generation Station, and uncertainty concerning its return to service.

To help resolve uncertainties surrounding the seismic hazard at Diablo Canyon, the California Energy Commission (Energy Commission), in the 2008 Integrated Energy Policy Report (IEPR) and Assembly Bill (AB) 1632 Report, recommended that PG&E use 3-D geophysical seismic reflection mapping and other advanced techniques to explore fault zones in the vicinity of DCPP.

While the Energy Commission supports PG&E and Southern California Edison in their efforts to implement the seismic hazard recommendation for 3-D seismic mapping, the Energy Commission does not have a discretionary role in reviewing the survey proposal, and will rely on the state's technical review panel and permitting agencies whose responsibility is to assess the adequacy of and act on the merits of the project as proposed.

Sincerely,

Handwritten signature of Robert B. Weisenmiller in black ink.

ROBERT B. WEISENMILLER  
Chair

Ms. Mary Shallenberger

October 26, 2012

Page 2 of 2

cc: Karen Douglas, CEC  
Andrew McAllister, CEC  
Carla Peterman, CEC  
Robert Oglesby, CEC  
Joan Walter, CEC  
Steve Blank, CCC  
Dayna Bochco, CCC  
Dr. William A. Burke, CCC  
Wendy Mitchell, CCC  
Jana Zimmer, CCC  
Martha McClure, CCC  
Steve Kinsey, CCC  
Mark W. Stone, CCC  
Brian Brennan, CCC  
Richard Bloom, CCC  
Esther Sanchez, CCC  
Janelle Beland, DPR  
John Laird, CNRA  
Michael R. Peevey, CPUC  
Michael Picker, Governor's Office  
Cliff Rechtschaffen, Governor's Office

# Independent Peer Review Panel

*A multi-agency panel of seismic hazard specialists  
established by the California Public Utilities Commission*

CALIFORNIA GEOLOGICAL SURVEY, CALIFORNIA COASTAL COMMISSION  
CALIFORNIA EMERGENCY MANAGEMENT AGENCY, CALIFORNIA ENERGY COMMISSION  
CALIFORNIA SEISMIC SAFETY COMMISSION, CALIFORNIA PUBLIC UTILITIES COMMISSION  
COUNTY OF SAN LUIS OBISPO

October 25, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: IPRP support for Offshore High Energy Seismic Survey

Dear Chair Shallenberger:

Thank you for the opportunity to provide expert opinion regarding the Offshore Central Coastal California Seismic Imaging Project proposed by the Pacific Gas and Electric Company (PG&E). In response to the AB1632 report by the California Energy Commission (CEC), the California Public Utilities Commission (CPUC) established the Independent Peer Review Panel (IPRP) to review and provide comments on seismic hazard studies at Diablo Canyon Nuclear Power Plant (DCPP). The comprehensiveness, completeness, and timeliness of these studies will be critical to the CPUC's ability to assess the cost-effectiveness of Diablo Canyon's proposed license renewal. We have reviewed the scope of the seismic surveys, including the proposed off-shore high-energy seismic survey, and commented on their applicability to seismic hazard analysis at DCPP in a series of reports. This letter provides our current evaluation of the proposed high-energy seismic survey.

## **PG&E Seismic Study Plan Progression**

The off-shore high-energy 3-D seismic study plans for DCPP have evolved from the originally proposed scope as presented in PG&E Letter DCL-2012-602 dated February 6, 2012, Figure 1. The original survey consisted of two large trackline boxes as indicated in the above referenced Figure 1. In response to IPRP comments based on maximizing data collection most relevant to seismic hazard assessments, and minimizing environmental impacts the survey was replaced with four smaller trackline boxes detailed in IPRP Report No. 3 dated April 6, 2012, and presented by PG&E in Letter DCL-2012-602 Figure 2. At the June 29, 2012 IPRP meeting PG&E presented an alternative high energy seismic trackline configuration (IIIb) that eliminated the northern-most area (Box 3). This is summarized in IPRP Report No. 4, dated September 25, 2012. The survey scope was again modified in response to the California State Lands Commission (SLC) permitting process, discussions with Coastal Commission staff, and the project extension to a 2-year period in November and December of 2012 and 2013. In the current proposal, the offshore survey for 2012 is a single survey area (Box 4) located in the Los Osos-Hosgri fault intersection region in Estero Bay north of DCPP, shown in PG&E report dated September 28, 2012, (Figure 1-2 page 5). The IPRP reviewed the objectives for the proposed 2012 survey and commented to PG&E, with a request for additional information on Oct. 11, 2012. The IPRP understood the objectives for the 2012 survey to include several geologic targets as well as the potential to refine the proposed 2013 surveys:

- Validation of the survey method as a test for the feasibility to image faults in the deep (5-15 km) Franciscan Complex basement rocks.
- Image the Hosgri, Los Osos, Shoreline and related faults as they converge at depth in a small area offshore of Pt Buchon.
- An opportunity to verify that environmental impacts mitigation strategies are successful.

PG&E's responses to the IPRP's questions in PG&E Letter DCL-2012-653 dated October 17, 2012, clarified the extent of the data collection within the survey box, and show that the surveyed area does cover the primary geologic targets of the survey, which are largely in the southeast quadrant of survey Box 4. The extent of data collection within the proposed survey box was also clarified, along with operational details of the survey.

The near-shore location of the Hosgri fault, 3-4 km from DCPD limits the possibility of conducting high energy seismic surveys oriented perpendicular or along a dip line, hence strike-line surveys are planned for this region in the direct vicinity of DCPD. For the proposed 2012 survey to the north at the Hosgri-Los Osos fault intersection region, a dip line survey is planned. A determination of the Hosgri dip in this region will have seismic hazard implications.

The Morro Strand onshore geophone array is included to provide information about the deeper crustal structure beneath Estero Bay. It is understood that data collected on this array will be of primary value in assessing future onshore deployments in the vicinity of the DCPD.

PG&E's responses to the IPRP's questions also included the information that an Independent Technical Reviewer (ITR) will be assigned by PG&E's Geoscience Department to review the accuracy, completeness and adequacy of the 3D marine seismic reflection data. The independent review of survey planning, acquisition and data processing has been a concern of the IPRP as discussed in IPRP Reports No. 3 and 4. Because of these concerns, the IPRP has discussed hiring additional technical experts who would have a similar charge as the ITR assigned by PG&E. The IPRP notes that the level of independence of the ITR is of paramount importance to the quality of the technical review and public acceptance of survey results.

### **Summary**

The IPRP finds that PG&E has responded to the questions directed to them and has shown that the initial phase of the proposed high energy survey includes an area where important information regarding the geometry and intersections of several faults may be imaged. The IPRP reached consensus that a 3D high energy seismic survey of Box 4 could provide valuable information about the faults that pose the greatest seismic hazard to Diablo Canyon Nuclear Power Plant.

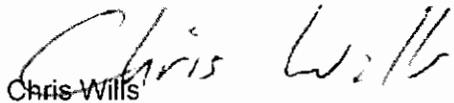
The IPRP did not reach consensus on whether PG&E has demonstrated that the survey currently planned is optimally designed to provide the highest quality data. The IPRP membership, with one exception, support the proposed testing as designed. IPRP member Bruce Gibson (San Luis Obispo County) has expressed general concerns regarding the overall survey planning and data processing approach selected by PG&E, and has not received responses that demonstrate to him that the planned survey is state-of-the-art. In the proposal before the Coastal Commission, Dr. Gibson is specifically concerned that, 1) that data quality over the most important targets (SE quadrant of Box 4) will be low, and 2) the data collected by the shore-based array will not provide an adequate image of the targeted features.

The remainder of the IPRP members acknowledge Dr Gibson's concerns, but believe that the currently planned survey is appropriate to provide preliminary answers to the primary questions

it is designed to answer. The opportunity for additional review of survey design between surveys in 2012 and 2013, whether by an ITR hired by PG&E, or by contracted experts and the IPRP, give the IPRP greater confidence that high energy seismic surveys will yield valuable data to understand the seismic hazards at Diablo Canyon. Dr. Mark Johnsson, representative of the California Coastal Commission on the IPRP, concurs with the opinions expressed in this letter, but takes no position on what the Commission's action regarding the Federal Consistency determination or Coastal Development Permit application should be.

The IPRP hopes that this perspective on the value of this survey for seismic hazard analysis helps the Commission weigh the benefits and impacts of the proposed survey.

Sincerely,

A handwritten signature in cursive script that reads "Chris Wills".

Chris Wills  
Chair, Independent Peer Review Panel



## PUBLIC UTILITIES COMMISSION

STATE OF CALIFORNIA  
505 VAN NESS AVENUE  
SAN FRANCISCO, CALIFORNIA 94102

MICHAEL R. PEEVEY  
PRESIDENT

**RECEIVED**  
OCT 12 2012  
CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

TEL: (415) 703-3703  
FAX: (415) 703-5091

October 12, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: CPUC support for CCC to issue permit to PG&E for DCPD seismic studies

Dear Ms Shallenberger and CCC Commissioners:

I am writing to you today to request the California Coastal Commission (CCC) to expeditiously issue the permit to enable Pacific Gas and Electric Company (PG&E) to perform high energy three-dimensional off-shore seismic surveys for its Diablo Canyon Power Plant (DCPP) as proposed to the CCC. It is important that these surveys be completed on schedule and within the authorized budget. Delaying the schedule proposed by PG&E would result in substantial additional costs. In addition, the fall is the only time of the year where the work can be done with minimum impact to marine mammals and the marine environment.

In accordance with PG&E's application to you for a permit, these seismic surveys are scheduled for November - December 2012. PG&E will be using the R/V Langseth, which is owned by the National Science Foundation and operated by Columbia University, to perform these seismic surveys.

As you know, the CPUC created an Independent Peer Review Panel (IPRP) to provide guidance and review the results of these enhanced seismic studies. The IPRP has reviewed PG&E's survey plans on several occasions. It is very important to the CPUC that PG&E remain on schedule and within budget for performing these off-shore seismic surveys. CPUC Decision D.12-09-008, increasing the authorized spending on enhanced seismic studies to \$64 million, was approved by the CPUC on September 13, 2012.

Immediately following PG&E's scheduled off-shore seismic survey, Southern California Edison is scheduling the same boat R/V Langseth to also perform off-shore surveys during December 2012 for its San Onofre Nuclear Generating Station. The R/V Langseth might not be available to PG&E if the permit from the CCC is delayed until 2013 or later.

In its revised application to the CCC, PG&E proposed the survey to cover one zone, identified as Box 4 in Figure 1-2 of PG&E's application, in off-shore areas north of DCPD in Estero Bay. Seismic surveys of Zones 1 and 2 would be performed by PG&E in 2013, subject to a later application to the

CCC. Performing surveys only in Zone 4 in 2012 would minimize any effects to the marine environment, and is acceptable to our IPRP.

The CPUC strongly encourages and supports the CCC to issue a permit to PG&E now so that the off-shore high energy seismic surveys as proposed by PG&E in Zone 4 can be performed in a timely fashion.

Sincerely,



Michael R. Pcevey  
President

cc: Steve Blank, CCC  
Dayna Bocho, CCC  
William Burke, CCC  
Wendy Mitchell, CCC  
Jana Zimmer, CCC  
Martha McClure, CCC  
Steve Kinsey, CCC  
Mark Stone, CCC  
Brian Brennan, CCC  
Richard Bloom, CCC  
Esther Sanchez, CCC

Catherine Sandoval, CPUC  
Mark Ferron, CPUC  
Michel Florio, CPUC  
Timothy Simon, CPUC  
Paul Clanon, CPUC  
Service List A.10-01-014

OCT 22 2012

CALIFORNIA  
COASTAL COMMISSION

**California Coastal Commission**  
**45 Fremont Street, Suite 2000**  
**San Francisco, CA 94105-2219**

Michael Jean Thibodeaux M.A. Naturalist Marine and Environmental Sciences.  
Adjunct faculty member Cal Poly State University San Luis Obispo, CA.  
[www.mjtthibodeaux@yahoo.com](http://www.mjtthibodeaux@yahoo.com)  
C.O.A.S.T. Alliance member.  
40 year Central Coast of California resident.

**October 18, 2012**

**RE: 3-D Acoustic Seismic Testing on the Central Coast proposed by PG&E**

This letter is to inform the California Coastal Commission of my unimaginable concern over the effects on marine life of the proposed 3-D acoustic testing in the waters around Diablo Canyon nuclear power plant, Avila Beach, and Estero Bay.

The Central Coast of California is home to one of the most diverse and healthy populations of sea mammals in the world. Migrating California gray whales, breeding elephant seals, California sea otters, California sea lions and harbor seals will be severely impacted by the proposed testing. Fish larvae, invertebrates, and rockfish will also be harmed or killed by this testing.

The highly endangered Western Gray Whale, of which there are only about 110 left in the world, migrate through our coastal waters in December and have been left out of all documentation for this proposed project.

The local fishing industry will be severely impacted, along with retail businesses, fish markets, local restaurants and all who serve the thousands of tourists who make up a large part of the local economy.

Data from other 3-D studies using similar technology show that it will take months to years to return a very delicate ecosystem back to normal, if ever.

This type of testing is completely unacceptable. As per AB1632 all existing studies of the area must be thoroughly reviewed. Alternative methods such as low-impact studies, better modeling and technology currently in development MUST be fully explored.

It is the responsibility of your agency to follow the precautionary Principal to do no harm to the marine environment if alternatives are available. Please do not issue a permit for this devastating acoustic technology.

**E-12-005**  
**PG&E SEISMIC SURVEY**

**LOCAL GOVERNMENT / TRIBAL**

**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:00 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: SSCSD Reso - Seismic Permit  
**Attachments:** reso.sesmic.121013.pdf

---

**From:** Carl, Dan@Coastal  
**Sent:** Monday, October 22, 2012 11:26 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: SSCSD Reso - Seismic Permit

---

**From:** Rob Schultz [<mailto:RSchultz@morro-bay.ca.us>]  
**Sent:** Friday, October 19, 2012 2:08 PM  
**To:** Carl, Dan@Coastal  
**Subject:** SSCSD Reso - Seismic Permit

See attached from SSCSD for the record.

Rob Schultz  
City Attorney  
City of Morro Bay  
595 Harbor Street  
Morro Bay, 93442  
(805) 772-6568 (office)  
(805) 772-6572 ( fax)

\*\*\*\*\*

This message may contain confidential or privileged information. If you received this message in error, please contact the sender and then delete this message from your system.

RESOLUTION NO.12-354

RESOLUTION OF THE BOARD OF DIRECTORS  
OF THE SAN SIMEON COMMUNITY SERVICES DISTRICT  
OPPOSING THE CENTRAL COASTAL CALIFORNIA  
SEISMIC IMAGING PROJECT

**WHEREAS**, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing in and around the waters of Central Coast; and,

**WHEREAS**, the San Simeon Community Services District is concerned with the impacts from the seismic testing; and,

**WHEREAS**, those concerns included the short-term, long-term and permanent effects on fish, fishing, and fish stocks; the short-term, long-term and permanent effects on marine mammals; a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and, the inability for vessels to leave and enter the Morro Bay Harbor; and,

**WHEREAS**, the project has not taken into consideration the land side impacts related to fishing that include, but are not limited to, reduced fish landing and processing activity, fuel docks, fish availability for restaurants, tourism and other environmental issues; and,

**WHEREAS**, the project has not identified an adequate mitigation and claims process for those affected; and,

**WHEREAS**, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

**NOW, THEREFORE, BE IT RESOLVED**, that the San Simeon Community Services District opposes the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

**PASSED AND ADOPTED** by the BOARD OF DIRECTORS of the San Simeon Community Services District at a regular meeting thereof held on the 10th of October 2012, by the following vote:

Upon motion of **Chairperson Ricci**, seconded by **Vice-Chair McAdams**, and on the following roll call vote to wit:

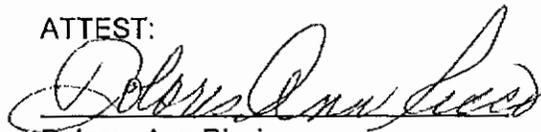
AYES: 3

NOES: 2

ABSTAIN:

ABSENT:

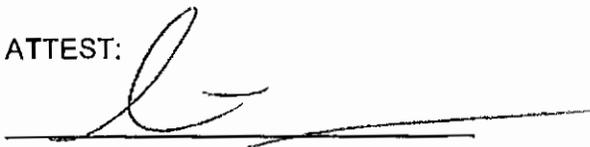
ATTEST:



Dolores Ann Ricci

Chairperson of the Board of Directors

ATTEST:



Charles Grace

General Manager/Secretary SSCSD

# BOARD OF SUPERVISORS

1055 MONTEREY, ROOM D430 • SAN LUIS OBISPO, CALIFORNIA 93408-1003 • 805.781.5450



November 1, 2012

*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

Mary K. Shallenberger, Chair  
Honorable Commissioners  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

**Re: Application No. E-12-005 and CC-027-12  
PG&E High Energy Geophysical Survey  
(Wednesday, November 14<sup>th</sup>, Item 13.b.)**

Dear Chair Shallenberger and Members of the Commission:

The San Luis Obispo County Board of Supervisors appreciates the opportunity to provide comment on the above-referenced application for a high-energy offshore seismic reflection survey, proposed to be conducted near the Diablo Canyon Power Plant (DCPP). Our Board has been actively involved for some time with efforts to better understand the earthquake seismic hazard at DCPP.

Our Board again considered this matter at our October 30, 2012 meeting. After reviewing our previous recommendations and hearing over four hours of public testimony, we are of the unanimous opinion that that your Commission should not approve the application for the project as currently proposed, for reasons noted below.

Your Commission is already in receipt of our Board's letter to the State Lands Commission (dated August 7, 2012, transmitted to you on September 17, 2012). The relevant paragraph of that letter reads:

*"Our Board believes that the State Lands Commission (CSLC) should only issue a permit for the Diablo Canyon HESS if the following conditions are met: 1) all environmental impacts are fully understood and mitigated to the maximum degree possible, understanding that mitigation to a level of insignificance may not be possible; 2) all unavoidable economic impacts are fully and fairly compensated; and 3) the technical details of the survey design have been subjected to independent third-party review by industry-qualified experts to confirm that the best available technology is applied to this crucial investigation."*

Our opposition to the proposal before you (a subset of the project submitted to CSLC) is based primarily on the fact that none of the three conditions listed have been realized.

Mary K. Shallenberger, Chair  
Re: Application No. E-12-005 and CC-027-12  
November 1, 2012

First, the environmental impacts of the proposed survey are not yet completely understood and therefore cannot be mitigated to the greatest extent feasible. There is broad concern about the effect that high levels of underwater noise may have on divers, swimmers, surfers, and other humans who may be in the ocean when the proposed testing takes place. If it proves necessary to close areas of the ocean to these activities then a closure protocol must be developed and mitigation for the lost recreational resource must be addressed. The Board also believes there should be further substantiation of the expected impacts to marine life.

Second, PG&E has not yet arrived at an adequate and comprehensive program to mitigate and compensate for the significant economic impact of the survey on ocean-dependent commercial interests, including commercial fishing, recreational fishing, other recreational activities (e.g., diving) and associated shore-based enterprises.

Third, the current survey design, which proposes using the vessel *R/V Langseth* towing four streamers, does not likely represent the state-of-the-art in 3-D high-energy data collection. For instance, a different vessel towing more streamers would create a wider survey footprint thereby reducing data acquisition time and its associated impacts. The technical details of the survey design should be subjected to an independent third party review by qualified industry experts to confirm that the best available technology is being applied. We expect no less than a demonstration that any high-energy offshore survey would provide the best possible scientific result with the least environmental impacts.

Our Board is driven by the fundamental concern that the earthquake hazard to the Diablo Canyon Power Plant be understood as thoroughly and objectively as possible. We acknowledge that a three-dimensional high-energy survey could provide information essential to a full understanding of the potential hazards off-shore of DCP. Given the significant environmental impacts, any such survey must be designed and executed to meet the highest standards.

As part of a proper design approach to this project, we believe that PG&E should first complete processing and interpretation of low-energy offshore data recently collected, as well as the substantial data sets collected onshore. Information from these related studies would provide important guidance in optimizing high-energy offshore data collection and processing parameters, consistent with modern survey design practice.

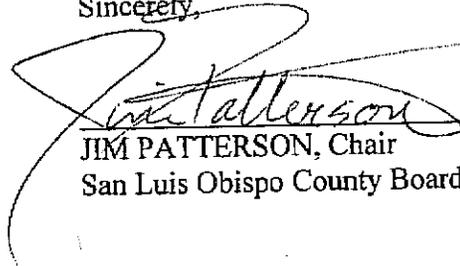
While PG&E has characterized their current proposal as a sort of pilot project, the stated project objectives are those of accomplishing a piece of the overall high-energy offshore survey previously proposed. It is not clear how the technical adequacy of this survey would be assessed, nor how any subsequent survey parameters might be optimized based on these results. Our position remains that independent review is necessary before any high-energy work is conducted offshore.

Mary K. Shallenberger, Chair  
Re: Application No. E-12-005 and CC-027-12  
November 1, 2012

In conclusion, our Board urges your Commission to deny the current application. PG&E's current proposal fails to describe and mitigate environmental impacts to the greatest degree possible, it lacks an adequate and comprehensive program to mitigate and compensate for economic impacts, and it lacks an independent third-party review of survey design to guarantee a state-of-the art seismic study.

Thank you for your consideration.

Sincerely,



JIM PATTERSON, Chair  
San Luis Obispo County Board of Supervisors

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# BOARD OF SUPERVISORS

1055 MONTEREY, ROOM D430 • SAN LUIS OBISPO, CALIFORNIA 93408-1003 • 805.781.5450



*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

September 17, 2012

Mr. Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and  
Federal Consistency Division  
45 Fremont St., Suite 2000  
San Francisco, Ca 94105

RE: Central Coastal California Seismic Imaging Project (CCCSIP), San Luis Obispo County

Dear Mr. Teufel:

I am writing to communicate the SLO County Board of Supervisors' position regarding the Central Coastal California Seismic Imaging Project (CCCSIP) remains as expressed in a letter sent to the State Lands Commission, dated August 7, 2012 (attached for your reference).

Residents of San Luis Obispo County have an obvious interest in being assured of the safe operation of the Diablo Canyon Power Plant. Thus, our Board believes it fundamentally important that advanced seismic reflection surveys be employed as part of a thorough examination of the earthquake risk to this facility.

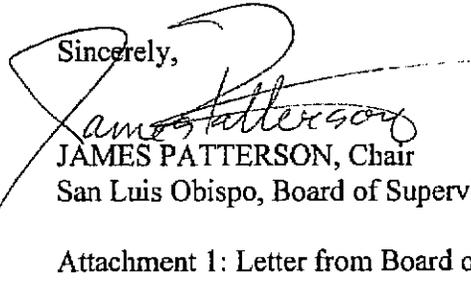
Our Board expects that such surveys would take every effort to avoid environmental impacts and mitigate unavoidable impacts to the greatest extent possible. Similarly, economic impacts to ocean-dependent businesses should be minimized and fully compensated.

The attached letter details the Board's further concern that independent third-party review of the proposed survey by industry-qualified experts is required to assure both the highest quality survey result and the lowest level of impact. While the basis for the necessary review is fairly technical (and included in the attached letter), my colleague, Supervisor Bruce Gibson, can provide further information, if you desire. Dr. Gibson has participated in the technical review of this project as part of the Independent Peer Review Panel established by the California Public Utilities Commission.

September 25, 2012  
CCCSIP, California Coastal Commission

We appreciate your Commission's careful review and consideration of this important project.  
Thank you.

Sincerely,



JAMES PATTERSON, Chair  
San Luis Obispo, Board of Supervisors

Attachment 1: Letter from Board of Supervisors to California State Lands Commission, 8/7/2012

# BOARD OF SUPERVISORS

1055 MONTEREY, ROOM D430 • SAN LUIS OBISPO, CALIFORNIA 93408-1003 • 805.781.5450



*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

August 7, 2012

State Controller John Chiang, Chair  
California State Lands Commission  
100 Howe Ave. Suite 100  
South Sacramento, CA 95825-8202

RE: Permit for a 3-D high-energy offshore seismic reflection survey,  
Central Coastal California Seismic Imaging Project (CCCSIP) near Diablo Canyon  
Power Plant, to be heard August 14, 2012

Dear Mr. Chiang:

The San Luis Obispo County Board of Supervisors appreciates the opportunity to comment on the high-energy offshore seismic survey referenced above, proposed by PG&E as part of a comprehensive evaluation of potential seismic hazards near the Diablo Canyon Power Plant.

In summary, our comments are these:

- Our Board endorses the execution a 3-D high-energy seismic survey (HESS) in the area generally outlined in PG&E's proposal, subject to conditions discussed below.
- We acknowledge that 3-D HESS at the scale necessary for this investigation will have significant environmental impacts that cannot be fully mitigated. We believe that, if the survey is properly designed and executed, the public benefit of enhanced knowledge of seismic hazards supports approval of such a survey, under the requirements of the California Environmental Quality Act (CEQA).
- We also acknowledge that the necessary survey will have significant economic impacts on ocean-dependent interests in this county, including commercial fishing, recreational fishing, other recreational activities (e.g., diving), and associated shore-based enterprises. The survey should be designed and executed to minimize these economic impacts. The unavoidable economic impacts should be fully and fairly compensated, based on an

independent assessment of those impacts that is confirmed with long term monitoring of catch rates.

- We are concerned that unresolved issues remain regarding the design of the proposed survey, specifically as to whether this proposal is consistent with industry state-of-the-art seismic reflection survey techniques (see discussion below and Attachments). The use of currently available industry technology could potentially reduce environmental impacts and improve the seismic image of important geologic targets.

Our Board believes that the State Lands Commission (CSLC) should only issue a permit for the Diablo Canyon HESS if the following conditions are met: 1) all environmental impacts are fully understood and mitigated to the maximum degree possible, understanding that mitigation to a level of insignificance may not be possible; 2) all unavoidable economic impacts are fully and fairly compensated; and 3) the technical details of the survey design have been subjected to independent third-party review by industry-qualified experts to confirm that the best available technology is applied to this crucial investigation.

## DISCUSSION

*Necessity of 3-D HESS.* The threat of seismic hazards to the Diablo Canyon Power Plant (DCPP) has long concerned the County and its residents, other public and regulatory agencies and PG&E. The most recent efforts to characterize seismic threats are driven by the requirements of Assembly Bill 1632 (Blakeslee, 2006), the discovery of the Shoreline fault immediately adjacent to DCPP (2008), and the tragic consequences of the Fukushima earthquake in 2011. The unexpectedly large earthquake at Fukushima, in particular, dictates that PG&E and all relevant public and regulatory agencies meticulously re-examine every aspect of seismic hazard analysis and gather further information to expand and solidify our understanding of the seismic threat to DCPP.

High-resolution 3-D seismic reflection surveys are essential to reveal the details of geologic structures that relate directly to earthquake potential. Such surveys produce detailed images of fault location, size, connectivity and sense of movement; these are fundamental parameters in the analysis of potential earthquake magnitude. The importance of 3-D seismic reflection mapping was emphasized by the California Energy Commission in their 2008 assessment of seismic vulnerability at DCPP.

The geologic targets to be examined by the proposed survey have been reviewed by the Diablo Canyon Independent Peer Review Panel (IPRP, created by the California Public Utilities Commission). As stated in formal comments to CSLC, the IPRP found that “1) the proposed survey generally covers the appropriate geologic targets, although we believe one area of the survey can be eliminated without compromising the seismic hazard analysis, and 2) that minor adjustments to the survey track orientation and extent in certain areas would be prudent to assure the best coverage of certain targets.”

Our Board concludes that the large scale of the proposed survey is necessary, acknowledging that some reduction may be possible, per the comment above.

*Environmental impacts.* CEQA obviously provides the appropriate framework for analysis of environmental impacts. We understand that CSLC staff has received numerous comments on the Draft Environmental Impact Report (DEIR) prepared for this project. In preparing the Final EIR (FEIR), and considering its certification, our Board urges the CSLC to be certain that, a) all relevant impacts have been identified, b) an appropriate range of alternative projects has been analyzed, and c) that the most extensive level of feasible mitigation has been applied, and follows with long term monitoring especially to impacts that are deemed significant and unavoidable (Class I).

As discussed below, issues of detailed survey design remain unresolved: the capability of the survey vessel directly relates to the time required for data acquisition and thus has bearing on the degree of impact to marine biological resources. Full examination of this issue may appropriately require the formal analysis of another alternative project.

*Economic impacts.* The FEIR identifies significant and unavoidable impacts to commercial fishing and recreational interests (Section 4.13) due to the preclusion of fishing during survey operations and damage to fish stocks. Environmental impact mitigations are centered on seasonal timing of the survey and communication with affected parties. While the FIER contains discussion of the value of fish landings, the unavoidable economic losses to these parties will also be significant and compensation for these impacts is not considered.

Our Board believes that this survey should not be permitted until full and fair compensation for expected economic losses to fishing and recreational enterprises (including those based on shore, such as processors and distributors of local seafood) has been established. Guidance for this effort might be provided by previous trans-oceanic cable laying projects, which had impacts due to the preclusion of fishing. Compensation for fishing losses should be based on an independent assessment of those impacts, that is confirmed with long term monitoring of catch rates.

*Seismic data acquisition, processing and interpretation specifications.* In the IPRP's technical review of the proposed survey, SLO County's representative (Supervisor Bruce Gibson) has raised questions and requested public discussion regarding the specifics of data acquisition, processing and interpretation within the survey footprint. These issues are discussed at length in a letter from Sup. Gibson to PG&E (dated June 20, 2012, Attachment 1) and PG&E's response (dated July 13, 2012, Attachment 2).

While PG&E has provided considerable detail on a wide variety of issues, unresolved issues remain as to whether the proposed survey is consistent with the seismic exploration industry state of the art (see Attachment 3). As noted below, the appropriate resolution of these issues would be independent peer review by qualified industry experts, having expertise beyond that of the IPRP membership.

One of these issues is relatively easy to describe. The proposed survey vessel would tow 4 laterally-separated streamers of hydrophones, covering a swath of 300-400 m of ocean surface with each pass of the survey vessel. In contrast, industry vessels can tow 10 or more streamers similarly spaced, resulting in a swath about 1000 m wide. As noted in PG&E's response (Attachment 2), the greater number of streamers "can reduce data collection time by a factor of 2 or 3."

PG&E contends, but has not demonstrated, that operation of a 10-streamer boat is not feasible in this survey area. The question should be settled by an industrial-level survey design review, which would model data acquisition geometry based on state-of-the-art streamer positioning technology. While the issue of data collection efficiency is certainly important because reduced survey time would reduce impacts to marine life, the larger streamer numbers and other industrial survey technologies could also improve the image quality of geologic targets.

## CONCLUSION

Our Board believes that the high-energy 3-D offshore survey of geologic structures near Diablo Canyon Power Plant should be designed with the greatest care and conducted with industry state-of-the-art technology. The residents of San Luis Obispo County deserve to know that every effort has been made to design and execute a survey that provides the highest-quality image of the potential geologic hazards in this area. Given the significant environmental and economic impacts, we realistically have only one opportunity to do a survey of this magnitude -- this survey must be done right.

In conclusion, we believe the information to be gained from this survey is crucial to public safety. We urge the State Lands Commission to issue permits for it only if the environmental and economic impacts have been properly addressed and the proposed survey design meets the highest scientific and technical standards.

Thank you for your consideration,

Sincerely,



JAMES PATTERSON, Chair  
San Luis Obispo, Board of Supervisors

Attachment 1 Letter from Supervisor Gibson to PG&E, June 20, 2012

Attachment 2 Letter from PG&E to Supervisor Gibson July 13, 2012

Attachment 3 Summary of Unresolved Technical Issues

## BOARD OF SUPERVISORS

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BRUCE GIBSON  
SUPERVISOR DISTRICT TWO

June 20, 2012

Mr. L. Jearl Strickland  
Director, Nuclear Projects  
Diablo Canyon Power Plant  
PO Box 56  
Avila Beach, CA 93424

RE: Central Coastal California Seismic Imaging Project (CCCSIP) -- High-energy 3D seismic reflection survey near Diablo Canyon Power Plant (DCPP)

Dear Mr. Strickland:

The Independent Peer Review Panel (IPRP, convened by the California Public Utilities Commission under Decision 10-08-003, 2010) has met several times and has commented on the design of the 3-D seismic survey referenced above. The IPRP has commented that, with certain adjustments, the overall survey coverage of geologic targets relevant to the seismic hazard analysis appears adequate. The IPRP, however, has also suggested more detailed review of the seismic acquisition and processing techniques proposed to be used within the overall survey footprint.

With this letter, I am requesting that PG&E provide public responses regarding the data acquisition and processing issues described below. Please note that I am writing here as an elected official representing the residents of San Luis Obispo County (and not officially on behalf of the IPRP). The basis for these questions is my previous experience as a seismic exploration research geophysicist (CV attached) and consultation with current experts in seismic acquisition and data processing.

Discussion of these issues is warranted because PG&E has proposed to use a survey vessel owned by the National Science Foundation and operated by Lamont-Doherty Earth Observatory of Columbia University (LDEO). While LDEO is an outstanding research institution, the seismic imaging capabilities of the academic world have historically lagged those available from seismic exploration contractors ("the industry"). This difference is attributable to superior acquisition technology, enhanced data processing techniques, and a comprehensive integration of acquisition and processing decisions.

The fundamental question then is whether PG&E's proposed survey is consistent with state-of-the-art seismic reflection imaging practice. As noted below, the proposed survey vessel has less acquisition capability than most industrial vessels, and since no data processing approach has been specified, no acquisition/processing coordination has been detailed. Given the importance of the seismic hazard analysis of the area surrounding DCPP, PG&E should publically explain why industrial-level current technology has not been proposed for these studies.

Sections below include a summary comparison of PG&E's proposed survey with the current industrial state-of-the-art. Sections following that contain expanded discussions of the relevant technical issues of 3-D seismic reflection practice.

### **PG&E's proposed survey**

The following summary specifications of PG&E's proposed survey are taken from the Project Description section of the Draft Environmental Impact Report prepared for the California State Lands Commission:

- One survey vessel towing 4 hydrophone streamers of 6 km length each, with a cross-line separation of 100 to 150 m.
- Two air-gun source sub-arrays towed by the survey vessel, fired alternately, cross-line separation 75 m.
- Offshore survey conducted over four defined areas. Within each area, air-gun shots taken along parallel track lines. Compass heading of track lines is constant in each area, resulting in a narrow range of source-receiver azimuths.
- Shallow water, near-shore (transition zone) data acquired by 5 lines of cabled geophones placed on the seafloor. Seismic sources located offshore (air-gun shots from the offshore survey) and onshore (vibrator trucks).

PG&E has indicated that design of the offshore and transition zone surveys was tested in an "illumination study" based on 2D and 3D ray-tracing calculations. No specific data processing for the acquired data or specific interpretation products have been specified.

### **Current industrial survey practice**

The current industrial state-of-the-art for complex geologic areas with deep imaging targets is as follows:

- One survey vessel towing 10 or more streamers of 7 to 8 km in length, with cross-line separations of 75 to 125 m.
- One air-gun source array located on the streamer boat and at least one additional and identical source array on a source-only boat. The two or more sources fire alternately (or sequentially, if more than 2). The purpose of the additional source(s) is to provide a wider source-receiver azimuth range to the recorded wavefield.
- Adjacent traverses of the seismic vessel through the survey area are offset laterally such that there is a partial overlap of the streamer spreads. This provides a finer cross-line spatial sampling of the reflected wavefield.
- Major steps in current 2D and 3D data processing include: data conditioning (ambient noise attenuation, estimation and equalization of source wavelets from one shot to the next), 3D surface related multiple elimination (SRME), several passes of migration/tomography (velocity) analysis to determine subsurface velocities, 3D pre-stack reverse time migration (RTM) and post-image signal enhancements.
- Transition zone surveys include seafloor hydrophones, as well as geophones. Extensive data processing is especially directed at static timing corrections, source wavelet equalization and suppression of water column reverberations.
- In designing both offshore and transition zone surveys, iterative finite-difference wave equation modeling of expected targets is used to develop acquisition parameters (source-receiver type, spacing and location) and integrated data processing techniques.

- Required interpretation products are considered during survey design, and usually include time and depth maps of key reflectors, maps of faults with discernible travel time offset, horizon-based and volumetric attributes, several of which assist in small fault detection.
- Interpretation products also include interval velocity maps (including azimuthal variations) for the characterization of azimuthal velocity anisotropy and the horizontal stress field.

Attachment 1 includes an expanded discussion of these technical issues, beginning with a description of the process of modern survey design.

#### Summary request for response

Comparison of the information summarized above clearly shows areas where PG&E's proposed survey design and execution is not consistent with current industry standards. Assurance of the quality of seismic images produced by the offshore and transition zone surveys is foundational to understanding the seismo-tectonic setting and the quantitative analysis of seismic hazard.

Given long-standing concerns regarding the seismic threat posed by the geologic setting near Diablo Canyon – concerns heightened by the Fukushima disaster – the public deserves to know that the best possible seismic survey technology is applied to the studies that PG&E is undertaking. Taking care to document now that data are to be acquired and processed at the highest standards is fundamentally important to the future interpretation of the results.

For these reasons, I request that PG&E provide justification for their proposed choice of survey parameters and approach, given the current industrial standards summarized above. I ask that, at a minimum, PG&E provide a thorough discussion of the specific issues listed below:

- The overall design approach for both the offshore and transition zone surveys should be described. The survey design discussion should explain how survey acquisition parameters, data processing sequence, and interpretation products were chosen and how these three elements are integrated.
- The offshore and transition zone survey design process should analyze results of recently-conducted land surveys to confirm the adequacy of acquisition parameters and processing flow.
- The choice of basic parameters such as spatial sampling interval and maximum source-receiver offset should be discussed relative to the spatial resolution required to image expected target structures at depth. For instance, what spatial resolution is required to evaluate geologic markers that might provide a measure of fault slip rate?
- The choice of towing only 4 streamers in the offshore survey should be evaluated. Typical industrial surveys deploy 10 or more streamers to improve survey efficiency (i.e., reduced acquisition time). This should be a significant issue for the proposed survey, which has been analyzed to have significant impacts to marine life, based on time exposure to the seismic source.
- The potential benefit of data acquisition over a wide (in contrast to the proposed narrow) source-receiver azimuth range should be evaluated for both image quality improvement and the ability to evaluate the orientation of maximum horizontal stress.
- The proposed seismic data processing flow, data processing contractor and experience should be specified.
- The potential benefit of evaluating vertical fracture alignment, maximum horizontal stress, and directional stress inequality should be discussed. While this information is not typically used in traditional seismic hazard analysis, it does relate to the physical state of the overall seismo-tectonic setting.

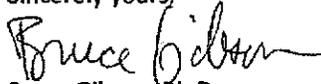
- The specific acquisition parameters and processing sequence of the transition zone survey should be discussed. Of particular importance would be the processing proposed to assure a high-quality seismic image after merging the transition zone data with the onshore and offshore survey data.

#### Conclusion

I appreciate the effort required to design and execute a high-quality seismic survey of the geologic setting surrounding this important facility, and I thank you in advance for your responsiveness to this request. I believe it vitally important that the public is assured that we are all making best efforts to develop a more robust understanding of risks to the safety of the Diablo Canyon power plant, a critical feature of our county's environmental and economic landscape.

If I can answer any questions or provide any further information, please don't hesitate to contact me. Thank you.

Sincerely yours,



Bruce Gibson, Ph.D.

Attachment 1. Discussion of survey design, acquisition, processing and interpretation

Attachment 2. B. Gibson's curriculum vitae

#### Distribution

Stuart Nishenko, PG&E

Tom Jones, PG&E

Eric Greene, CPUC

Sup. Adam Hill, SLO County

Jennifer DeLeon, State Lands Commission

Cy R. Oggins, State Lands Commission

**ATTACHMENT 1**  
**DISCUSSION OF SURVEY DESIGN, ACQUISITION, PROCESSING AND INTERPRETATION**  
**June 20, 2012**

**Seismic survey design**

The design of a modern industrial seismic survey begins with the question "What are the imaging goals of the survey?" The answer to that question involves specification of parameters such as imaging target depth and the desired vertical and horizontal resolution. The main objective of the seismic imaging project, as stated in IPRP Report No. 3 (dated April 6, 2012), is to "explore fault zones in the vicinity of the DCP, especially the intersection between the Hosgri and Shoreline faults." Targets to be imaged might range in depth from the seafloor (top of the sedimentary section) to as deep as 15 km (maximum seismogenic depth). In general, a seismic survey of targets over this depth range will require long source-receiver offsets, densely spaced sources and receivers, and small common midpoint (CMP) bins.

Once these basic parameters are set, the next question is "Given the survey goals and desired parameters, our knowledge of the geology of the area, and all environmental issues, what data acquisition and processing specifications are sufficient to meet the goals in an environmentally sound and economical fashion?" Consideration of the geology is important because the complexity of an area has a large impact on the detailed design of the survey. Challenges such as those related to large subsurface dips, velocity-field complexity and high acoustic attenuation zones must be recognized and planned for. Environmental considerations encompass many aspects, including: weather, ocean currents, obstructions to navigation, shipping lanes, ambient noise, and the regional fauna and flora that could be affected by the survey activity.

As discussed below, the specifics of data acquisition parameters are typically determined by iterative modeling of the expected seismic response of the survey targets for a variety of source and receiver combinations. The modeled seismic response is then processed to confirm both the survey acquisition geometry and the necessary data processing flow. This integration of acquisition and processing, which has not been discussed by PG&E, is fundamental to modern reflection survey design to assure the expected effectiveness of the survey, as constrained by the environmental factors listed above.

The current industry state-of-the-art for survey design is to create synthetic acoustic seismic data using finite-difference wave-equation calculations for a specific geology and a range of acquisition parameters. Each model data set is then processed using appropriate techniques such as 3D surface related multiple elimination (SRME) and 3D reverse time migration (RTM). This allows the best of the acquisition designs to be selected based on the evaluation of the final image. If details of the geology are unknown, an informed guess can be used. For example, a survey designer can pose and answer a question such as "If a high-dip fault existed in this area, could it be imaged using this acquisition and processing scheme?"

In the complete design of a survey, the interpretation goals, methods, and products should be specified as well. At the minimum, the interpretation output would include: time and depth maps of all key reflectors, showing faults with discernible offset in time or depth; horizon-based and volumetric attributes for subtle fault detection, and interval velocity maps between key reflectors (including information on the azimuthal variation of interval velocity). The azimuthal interval velocity maps (co-rendering of the local fast, slow and azimuth of fast interval velocity) can be used to discern the azimuth of local maximum horizontal stress and the inequality of the horizontal stresses.

### **Marine acquisition parameters**

*Spatial sampling.* In typical marine surveys, the spatial sampling is most dense along the streamer direction and thus most survey tracks are generally oriented in the targets' dip direction. In the CCCSIP, shooting tracks (which in some areas parallel the fault's strike) should be carefully assessed for the ability for direct fault imaging. However, shooting parallel to fault strike will enhance the spatial resolution of information that may be helpful in estimating past slip movement. The tradeoffs presented by shooting direction can be assessed with survey design modeling, described above.

*Maximum source-receiver offset.* From a pure imaging standpoint, longer offsets allow imaging of deeper structure. A 6-km maximum offset provides acceptable imaging down to a depth below sea level (BSL) of about 6 km. From an interpretation standpoint, longer offsets provide valuable amplitude versus offset (AVO) information for inversion of rock properties.

*Number of towed streamers.* Typical industrial survey vessels tow 10 or more streamers with nominal cross-line separations of 100 m. In general, a greater number of streamers towed reduces the number of required shooting passes. This improved data acquisition efficiency results in economic -- and potentially environmental -- benefits. An additional important advantage is that a wider streamer spread samples more of the reflected wavefield, which can enhance image quality relative to narrow-spread streamers.

While more streamers are potentially better, survey design decisions involving the number of streamers must consider both the capability of the survey vessel (streamer storage and handling capacity, towing horsepower) and environmental constraints (ocean currents and obstructions).

*Position accuracy.* Position accuracy of the source and receivers directly affects the overall fidelity of the seismic image. For example, in marine surveys, accurate source and receiver depths lead to consistent and better deghosting from one trace to the next. In the land case, vertical accuracy is required for application of elevation statics. Lateral accuracy is related to the fidelity of both data conditioning (interpolation and 3D SRME in particular) and imaging processing steps. These algorithms depend on knowledge of the locations of the source and receivers; if those data are poor quality, then the algorithm results will be likewise. The end result of poor positioning accuracy is a decrease in the resolution of the final image. Typical vertical and lateral accuracy are about  $\pm 0.5$  m and  $\pm 3$  m or better, respectively. For wide-azimuth surveys the cable steering is generally used to keep the streamers parallel to one another. Active steering fins on streamer cables can change the cable feathering by as much as  $\pm 4^\circ$ . Knowledge of expected ocean currents is important to assessing streamer positioning accuracy.

### **Wide-azimuth seismic reflection surveys -- acquisition and processing**

For areas with complex geology, wide-azimuth data can contribute significantly to better quality of the subsurface image<sup>1</sup>. Additionally, wide-azimuth data analysis has become commonplace in mapping the in-situ horizontal stress field (azimuth of local maximum horizontal stress, and inequality of the horizontal stresses), and the dominant vertical aligned fracture set (its azimuth and relative fracture density)<sup>2</sup>. Differences in the horizontal stress field in and around the known (and unknown) faults may prove valuable to the tectono-physicists in understanding potential fault ruptures.

Marine wide-azimuth seismic acquisition was originally developed to improve the imaging of reflecting horizons lying below complex structures such as salt domes. The method is also valuable, however, for any regime that includes high dips and significant structure in the cross-line direction. For the geologic situations just mentioned, a narrow-azimuth seismic survey can produce sub-optimal imaging results. The

basic problem is that with complex geology the subsurface can scatter the incident wavefield in all directions. If the orientation of an acquisition program favors only a specific source-receiver orientation (narrow-azimuth), then it is likely that portions of the scattered wavefield are not recorded. As a result, those portions of the scattered wavefield cannot contribute their information to the final seismic image, thereby creating zones in which the image is misleading or even entirely missing<sup>3</sup>.

The acquisition of wide-azimuth marine data generally requires more than one shooting boat, although creative vessel navigation has been used to accomplish similar results<sup>4</sup>. The lateral offset of a second source boat (offset typically 1 – 2 km cross-line to the receiver array) is the most efficient means of widening the range of source-receiver azimuth. Since image quality is sensitive to source timing and location, sophisticated control systems are required to coordinate shot initiation and positioning of multiple vessels.

Among the first data processing issues of marine surveys, suppression of multiple reflections is particularly important. State-of-the-art processing includes a 3D SRME algorithm that is capable of predicting multiples for data that are irregularly sampled (because of cable feathering, for example). Failure to suppress multiples causes artifacts to appear in migrated images. Such artifacts can obscure primary reflections or might even be misinterpreted as primary reflections. Successful multiple suppression requires significant computing resources and experienced technical staff.

Processing software must also account for and estimate the azimuthal variation in travel times (velocity). Not only can this information be used in interpretation, it is essential to include the azimuthal variations in velocity to obtain the best image possible. Otherwise, the stacked image after pre-stack migration will lose bandwidth due to improper event alignment.

Data processing that reveals the azimuthal variation in the AVO (amplitude variation with offset) is the state-of-the-art for vertical aligned fracture detection and characterization. Azimuthal variations in interval velocities, after pre-stack time migration that preserves azimuth and offset, are used to characterize the in-situ horizontal stress field.

#### **Transition zone surveys – acquisition and processing**

Seismic surveys in areas covered by shallow water (transition zones) are particularly challenging because the physical characteristics of each transition zone are unique. Transition zone survey design must consider water depth, wave action, tides, water bottom characteristics, type of onshore terrain, and other factors. In general, the survey designer tries to create a well-sampled distribution of receivers and shots that will provide a data set that can be processed successfully using standard algorithms.

Most transition zone surveys include deployment of water-bottom and onshore recording sensors with air-gun arrays for offshore shots and vibrators for onshore shots. A dual-sensor (hydrophone/vertical component geophone) is the minimum industry standard for ocean-bottom recording in transition zones. Vertical geophones are particularly valuable for helping to eliminate water-column reverberations during processing. Four-component (3 components of geophone and one hydrophone) sensors are used when shear-wave information is acquired.<sup>2</sup> Four-component recording is indicated when knowledge of the in-situ stress field and vertical aligned fractures is desired. The P-S (mode-converted shear wave reflections) data are sensitive to the presence of unequal horizontal stresses and vertical aligned fractures; these P-S data can be compared to the azimuthal P-P reflections to learn of lithology, porosity, pore fill, stress state, and fractures.

A key challenge in processing transition zone data is that the individual portions of the survey have to be matched for the various combinations of sources and receivers. For a standard dual sensor, there are four

data subsets: air gun/hydrophone, air gun/geophone, vibrator/hydrophone, and vibrator/geophone. Each source/receiver combination has a unique "wavelet" response to the initiation of a shot. Extensive data processing by experienced personnel is required to convert the individual wavelets to a common form. This conversion is necessary before the entire volume of recorded data can be merged to produce a unified image.

Other data processing challenges within the transition zone survey include 1) static time corrections that must be applied to the data subsets (each subset requiring a different set of statics, 2) water-column reverberations which can be extreme and might require specialized processing in order to reveal the subsurface reflections of interest, and 3) estimation and correction of the variability of geophone-seafloor coupling.

If the transition zone data are to be merged with the deep-water 3-D survey, additional data processing, including wavelet correction and ghost reflection corrections, must be applied. In any case, transition zone imaging requires extraordinary documentation (e.g., water depths, tidal variations) and seamless coordination of acquisition and processing.

#### **General data processing issues**

Major steps in current 2D and 3D data processing include: data conditioning (ambient noise attenuation, estimation and equalization of source wavelets from one shot to the next), 3D surface related multiple elimination (SRME), several passes of migration/tomography (velocity) analysis to determine subsurface velocities, 3D pre-stack reverse time migration (RTM) and post-image signal enhancements.

In marine surveys, successful data processing depends on good onboard quality control during acquisition. The survey vessel should have adequate computing capability to assure that noise and other possible processing issues can be successfully dealt with in the final processing flow.

While the data processing sequence will be evaluated in the survey design phase described above, it is also important to review the processing flow and image results of previously recorded data. For instance, in the CCCSIP, the images produced from the land-based data recorded in 2011 (vibrator and accelerated weight drop sources with nodal recording) should be reviewed to inform future processing decisions.

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- 3. Breakthrough acquisition and technologies for subsalt imaging (see Figure 1)**  
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- 4. A single-vessel method for wide-azimuth towed-streamer acquisition**  
*Nick Moldoveanu, Jerry Kapoor, and Mark Egan*  
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**Attachment 2**

**CURRICULUM VITAE**

**BRUCE GIBSON**

San Luis Obispo County, California

**CURRENT POSITION:**

San Luis Obispo County Supervisor (District 2); reelected in June, 2010 to second term through 2014. As Supervisor, I also serve on the following local Boards and Commissions, and am active in the California State Association of Counties.

**LOCAL BOARDS:**

Local Agency Formation Commission (LAFCO)  
San Luis Obispo Council of Governments (SLOCOG) (Chair)  
San Luis Obispo Regional Transit Authority (SLORTA)  
Air Pollution Control District (APCD) (Chair)  
Integrated Waste Management Authority (IWMA)  
San Luis Obispo First 5 Commission

**CALIFORNIA STATE ASSOCIATION OF COUNTIES (CSAC):**

Member, Board of Directors  
Chairman, Government Finance and Operations Committee  
Member, Coastal Counties Regional Association

**PREVIOUS GOVERNMENTAL SERVICE:**

2005 - 2006 Commissioner, San Luis Obispo County Planning Commission;  
2000 - 2003 Member, Ag Preserve Review Committee, San Luis Obispo County Advisory Committee for Williamson Act contract applications;  
1998 - 1999 Member, Facilities Advisory/Oversight Committee, Coast Union School District, Cambria, CA;

**PREVIOUS CONSERVATION/ENVIRONMENTAL ACTIVITIES:**

2001- 2006 Member, Board of Directors, Cayucos Land Conservancy (a private non-profit land trust);  
1998 - 2006 Member, Board of Trustees, The Land Conservancy of San Luis Obispo County, (a private, non-profit land trust). President, 1999-2001 and 2002-2004.

**PREVIOUS EMPLOYMENT:**

1990 - present Self-employed rancher/farmer, Cayucos  
1984 - 1989 Research Scientist, Rice University, Houston, TX, Director of Data Processing for the Department of Geology and Geophysics. Responsible for data processing of crustal-scale seismic reflection data and teaching of seismic reflection data processing techniques. Conducted research on seismic reflection response and imaging issues of randomly heterogeneous crustal materials.  
1976 - 1984 Senior Research Geophysicist, Western Geophysical Co., Houston, TX. Conducted research and development of seismic reflection imaging techniques. Published research on signal processing (deconvolution), and 2-D and 3-D time and depth migration imaging techniques.  
1973 - 1976 Research Assistant, University of Hawaii, Honolulu, HI

#### **EDUCATION:**

B.A., Physics, 1973	Pomona College, Claremont, CA
M.S., Geophysics, 1975	University of Hawaii, Honolulu, HI
Ph.D., Geophysics, 1989	Rice University, Houston, TX

#### **TECHNICAL PUBLICATIONS**

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#### **SCIENTIFIC ORGANIZATION MEMBERSHIPS**

American Geophysical Union  
Society of Exploration Geophysicists

Attachment 2



*Pacific Gas and  
Electric Company*

Diablo Canyon Power Plant P.O. Box 58  
Avila Beach, CA 93424

July 13, 2012

PG&E Letter DCL-2012-637

Dr. Bruce Gibson  
Supervisor, District 2  
San Luis Obispo County  
San Luis Obispo, CA 93401

Response to June 20, 2012, Request for Information

Dear Dr. Gibson:

Please find attached a response to the questions that you presented in your June 20, 2012 letter associated with the Central Coastal California Seismic Imaging Project (CCCSIP).

After you have had time to review the responses, we are interested in bringing in our science team leads to expand upon the answers and address any other questions that may be generated from this response.

We look forward to further discussions on these important studies.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Strickland'.

L. Jearl Strickland  
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Enclosure

**Pacific Gas and Electric Company's Response to  
Bruce Gibson June 20, 2012, Request for Information**

**Introduction**

In 2008, the California Energy Commission (CEC) completed an assessment of the vulnerability of Diablo Canyon Power Plant (DCPP) to a major disruption due to a seismic event or plant aging, as required by CA Assembly Bill (AB)1632 (Blakeslee, Chapter 722, Statutes of 2006). As a result of that assessment, the CEC recommended that Pacific Gas and Electric Company (PG&E) complete additional seismic studies using three-dimensional (3D) seismic reflection mapping and other advanced geophysical techniques to explore fault zones near DCPP. In addition, PG&E funded U.S. Geological Survey research that reevaluated more than 20 years of earthquake data that led to the discovery of the Shoreline fault zone in 2008. In 2009 and 2010, both the California Public Utilities Commission (CPUC) and the California Coastal Commission (CCC) directed PG&E to complete the advanced studies recommended in AB1632 as part of their license renewal feasibility studies and reviews. The CPUC established an Independent Peer Review Panel (IPRP) in 2010 to provide an independent peer review and comment on these proposed seismic studies.

The PG&E High Energy Seismic Survey (HESS) program is one task in a series of comprehensive geologic/ geophysical investigations that PG&E has been conducting as part of the Central Coastal California Seismic Imaging Project (CCCSIP). The CCCSIP represents the continuation of earlier studies initiated in 2008 and 2009 that specifically addressed the Shoreline fault zone. The CCCSIP involves government, academic and industry partners including the National Science Foundation, Columbia University/ Lamont-Doherty Earth Observatory, the Scripps Institute of Oceanography, the University of Nevada/Reno, the CSU Monterey Bay Sea Floor Mapping Lab, Fugro Consultants Inc., Nodal Seismic, Bird Seismic Services, Fairfield Nodal, NCS SubSea, and others in order to collect the highest quality seismic and geophysical data using state-of-the-art technologies. In recognition of the substantial costs involved to perform these types of studies, PG&E has adopted a systematic, nested approach to conduct the CCCSIP. Regional scale surveys are used to identify areas for more comprehensive, high-resolution site-specific investigations.

In addition to the integration and interpretation of the diverse geologic and geophysical data sets collected as part of the CCCSIP, there are additional challenges and demands that are not usually encountered in industry work. These include the need for Nuclear Quality Assurance / Quality Control (QA/QC) oversight and documentation (including extensive software and hardware calibration and validation), participatory peer review requirements consistent with the needs of the informed technical community (including the CPUC IPRP, US Nuclear Regulatory Commission (NRC) and Senior Seismic Hazard Analysis Committee (SSHAC) processes), public transparency, and extraordinary environmental and permitting constraints.

The following comments are presented in response to the specific issues listed in Dr. Gibson's letter to PG&E dated June 20, 2012.

Request 1

*The overall design approach for both the offshore and transition zone surveys should be described. The survey design discussion should explain how survey acquisition parameters, data processing sequence, and interpretation products were chosen and how these three elements are integrated.*

Response 1

Initial IPRP review of PG&E'S plans focused on the geologic targets or fault segments to be surveyed and the potential impact of that information on the seismic hazard evaluation for DCP. Those geologic targets and their potential impacts on the DCP seismic hazard analysis were identified in PG&E's 2011 Shoreline Fault Zone report to the NRC. Updated ground motion models used in the NRC Report identified strike-slip earthquakes along the Shoreline and Hosgri fault zones as well as reverse-slip earthquakes on the Los Osos and San Luis Bay fault zones as the key contributors to seismic hazard at DCP.

To better constrain the four main parameters needed for a seismic hazard assessment: geometry (fault length, fault dip, down-dip width), segmentation, distance offshore from DCP, and slip-rate, PG&E conducted a series of sensitivity studies to document which of those four sets of parameters had the greatest impact on reducing the overall uncertainty for hazard estimates. The offshore target areas and the parameters to be addressed by the CCCSIP are listed in Table 1. These issues determined the design goals of both the Low and High Energy 2D and 3D Seismic Surveys.

**Table 1** List of Targets for Offshore Geophysical Studies

<b>Target Region</b>	<b>Technical Issue</b>	<b>Method</b>
Hosgri-San Simeon step-over	Geometry of the step-over. Is it really a segmentation point?	Low Energy 2D / 3D High Energy 3D
Hosgri fault offshore DCP	Slip Rate	Low Energy 2D / 3D
	Dip	High Energy 3D Regional geophysical studies
Shoreline fault zone	Geometry of northern segment	Low Energy 2D / 3D High Energy 3D

Target Region	Technical Issue	Method
	Southern extent	Low Energy 2D / 3D
	Slip Rate	Low Energy 2D / 3D
Hosgri-Shoreline Intersection	Structural relationship between the Hosgri and Shoreline fault	Low Energy 2D / 3D High Energy 3D
Los Osos fault	Structural relationship between the Hosgri and Los Osos fault	Low Energy 2D / 3D High Energy 3D
	Slip rate	Low Energy 2D / 3D
San Luis Bay fault	Dip	Low Energy 2D / 3D High Energy 3D

The overall design approach for both the LESS and HESS studies is dictated by the technical goals to be addressed as well geographic setting of the site (e.g., water depth, navigation obstacles), the capabilities of the survey vessel(s) and equipment, as well as environmental and permitting constraints

As shown in Table 1, the 2D and 3D LESS studies of the Shoreline fault conducted in 2010 and 2011 focused on the northern and southern ends, near Point Buchon and within San Luis Bay, respectively. These surveys addressed the shallow structure of the Shoreline fault as well as identified possible piercing points or areas where the Shoreline fault intersected recent geomorphic features in order to determine fault slip rates.

Both the LESS studies and the onshore 2D/ 3D seismic surveys in 2011 tested the feasibility of conducting further seismic profiling along the continental shelf offshore of DCP. Much of the Tertiary rocks within the onshore Irish Hills and offshore continental shelf are underlain by the highly chaotic Mesozoic Franciscan Formation. As discussed in Request 2, results from onshore seismic surveys in 2011 provided an important pilot test or feasibility for conducting additional HESS surveys offshore. Could PG&E, in fact, use 3D seismic survey techniques to image structures within the Franciscan? Based on these initial results, the subsurface structures are truly complex and intrinsically 3D; 2D seismic reflection data acquisition is not a reliable or appropriate approach to accurately image crustal structure in this area. Systematic 3D data acquisition with rigorous population of common mid-point (CMP) bins over a wide range of offsets and azimuths is necessary to obtain spatially accurate images of crustal structure in CCCSIP study area.

Based on the lessons learned from the 2011 onshore survey and advice from PG&E's contractors concerning marine 3D multichannel data acquisition, PG&E's response to Request 3 discusses the basic seismic acquisition parameters, such as spatial sampling interval and maximum source-receiver offset, needed to image the target structures listed in Table 1 at depth. One of the major survey design issues is the close proximity of the geologic targets to shore. The central section of the Shoreline fault lies within the Transition or Intertidal Zone in water depths less than 25 m. As discussed in Request 4, safety concerns about operating large vessels in shallow water with rocks and kelp beds precluded conventional approaches to seismic imaging. As a result, other strategies, including high resolution helicopter aero magnetics and marine gravity surveys as well as the deployment of marine nodes were developed to image the Transition Zone.

In order to constrain the deeper geometry of fault zones and image to the depths at which earthquake are occurring, 3D HESS surveys require the use of 6 to 8 km long streamers. This influences the orientation of the survey racetrack design. While the ideal seismic survey orientation is generally perpendicular to structure (dip lines), the close proximity of both the Hosgri and Shoreline faults to shore in the region between Point Buchon and Point San Luis (less than 1 streamer length) requires orienting survey lines parallel to the strike of the fault (strike lines) instead of perpendicular to the fault (dip lines). The overall width or footprint of these strike line survey tracks, however, is still influenced by the closest approach to shore. As shown in Figure 1, HESS Survey Racetracks or Boxes 1, 2, and 3 were designed to account for these geometric constraints.

As shown in Figure 1, HESS Survey Box 4 in Estero Bay is oriented to be roughly perpendicular to the strikes of the Shoreline, Los Osos and Hosgri faults and provides an opportunity to conduct dip survey lines in this area. This would provide a broader azimuthal coverage of complex geologic structures in the area, consistent with PG&E's response to Request 5.

The data acquisition and processing is addressed in PG&E's response to Request 6. Initially, data from each of the offshore, transition zone and onshore 3D surveys will be collected and processed independently. Accordingly, the first phase of the survey data acquisition planning is focused on producing data sets in an industry standard SEG-Y data format that be integrated at a later date. Post-cruise, the latest industry processing toolkits will be used to produce both 3-D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic Imaging and/or GeoTrace. Recent advances in 3D tomography and full waveform inversion (FWI) techniques will also be applied to these new data.

Once the seismic data are processed, interpretation teams consisting of geoscience professionals with expertise in specific areas (e.g., seismic interpretation, structural geology) will be assembled to integrate and interpret data following the delivery of final processed data. In addition to individual SEG-Y files, data will be merged in a Kingdom

Suite 3D volume or cube to facilitate analysis and visualization of data for interpretation and further analysis.

Request 2

*The offshore and transition zone survey design process should analyze results of recently-conducted land surveys to confirm the adequacy of acquisition parameters and processing flow.*

Response 2

The major findings from the 2011 onshore seismic reflection survey in the Irish Hills are:

- (1) Successful imaging of the Franciscan basement can be accomplished, contrary to previous expectations
- (2) The identification of swept frequency and geophone spacing parameters necessary to capture both shallow and deep imaging
- (3) There is a higher expectation of success in imaging the Transition Zone through the use of onshore and offshore seismic sources

The following sections provide a more detailed discussion of these results.

Proprietary seismic reflection data within the greater Irish Hills owned by ConocoPhillips was licensed and reprocessed to determine the effectiveness of several types of seismic sources and recording configurations. The results of the ConocoPhillips data analyses were used to define the 2011 2D onshore testing and data acquisition program in the Irish Hills.

The primary findings from the analyses of the ConocoPhillips data are presented first, followed by a summary of the findings from the 2011 2D onshore testing and data acquisition program in the Irish Hills

*1984 ConocoPhillips Data*

ConocoPhillips acquired Dynamite data from one line in the central portion of the Irish Hills north of the DCPD property. Most of the ConocoPhillips line was located in Tertiary rocks, with the north end of the line extending about 1 km north of the southern Edna fault trace into Franciscan rocks. ConocoPhillips acquired data from six lines in the Irish Hills although five of the six lines were located east of the DCPD property. Three of the ConocoPhillips lines used Dynamite and three of the lines used Vibroseis™ sources (Table 2).

**Table 2** 1984 ConocoPhillips Reflection Line Acquisition Parameters

Line Number	Line Name	Datum (ft)	Fold	Source	Channels	Group Interval (ft)	Shot Interval (ft)	Length (s)
1	p6502-1	800	24	Vibroseis™	96	82.5	165	4
3	p6502-3	800	24	Vibroseis™	96	82.5	165	4
4	p6502-4	200	24	Vibroseis™	96	82.5	165	4
6	p6502-6	800	24	Dynamite	96	110	220	4
9	p6598-9	200	24	Dynamite	96	110	220	4
13	p6598-13	1600	24	Dynamite	96	110	220	4

The ratio of signal to noise in the data is a function of acquisition parameters (Table 2), as well as the source and receiver configurations (Table 3). The deep shot holes and large charge (10 lb) used for line 13 (Table 3) produces the best overall signal quality, but the resolution of deeper structure is compromised by the high frequency (28 Hz) geophones used to record the Dynamite source and the limits of the maximum offsets attained with the 96 channel recording systems (Table 3). Also, there were many dead channels and frequency strong coherent electrical noise in most of the Dynamite shot records that further decreased signal strength.

**Table 3** 1984 ConocoPhillips Reflection Line Source and Receiver Configurations

Line Number	Line Name	Source	Sweep (Hz) or charge (lb)	Source Configuration	Geophone	Offset range (ft)
1	p6502-1	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
3	p6502-3	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
4	p6502-4	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
6	p6502-6	Dynamite	0.5 lb	9 5 ft holes	28 Hz	110-5280
9	p6598-9	Dynamite	0.5 lb	9 5 ft holes	28 Hz	110-5280
13	p6598-13	Dynamite	10 lb	1 25 ft hole	28 Hz	110-5280

The sequence of steps in processing the data (Table 4) was designed and adjusted to evaluate signal quality as a function of frequency. Several high-frequency upper limits were selected for band pass filtering and the data stacked to determine the maximum frequency that produced the best signal-to-noise ratio. Although the Dynamite source

noise dominated at frequencies greater than 50-60 Hz and at frequencies greater than 40 Hz for times later than 2.3 to 2.5 seconds.

**Table 4** 1984 ConocoPhillips Data Processing Sequence

Step	Description
1	Reformat field SEG-Ydata
2	Vibroseis cross-correlation Sample rate 2 ms
3	Geometry definition (Vibroseis™ and Dynamite data)
4	Pick first breaks; Calculate Refraction Statics; 1 Layer Model; VO is 3000 feet/sec Datum is 200/800/1600 feet, replacement velocity is 7500/8000 feet/second
5	Trace edits and reversals
6	Amplitude recovery $T^{1.2}$ , Air blast attenuation
7A	Dynamite data only: Surface consistent deconvolution, operator 160ms, gap 18 ms, time variant spectral whitening, 6/12-57/65 Hz frequency limits determined from spectral analyses and stacking tests of the data, multiple gate equalization
7B	Vibroseis™ data only: Time variant spectral whitening, 8 - 80 Hz frequency limits, one gate equalization
8	Statics to floating datum
9	Interactive velocity analysis; Residual statics surface consistent; Interactive velocity analysis; Residual statics surface consistent; CDP trim statics
10	Final normal moveout; Initial mute; 500 ms agc
11	Flat datum statics, datum varies as per Table 1, VR is 7500/8000 fps
12	Create final unfiltered stack cdp stack $1/\sqrt{n}$ Time Variant Bandpass filter: For: Vibroseis™ data 10/18-55/65 hz. 0.0 - 1.7 sec. 8/18-35/45 hz. 2.3 - 4.0 sec. Fx predictive deconvolution, Trace balance For: Dynamite data 10/15-50/60 hz. 0.0 - 2.0 sec. 8/13-35/45 hz. 2.5 - 4.0 sec. Fx predictive deconvolution, Trace balance Output Final stack in SEG-Y format

The 28-Hz geophones used for acquisition of lines 6, 9, and 13 (Tables 2 and 3) reduce resolution at two-way travel times greater than 2.5 seconds because the stack tests revealed that there is little signal at times greater than 2.5 seconds in the Dynamite data at frequencies greater than 40 Hz (step 12 in Table 4). Because the frequency-dependent stacking tests showed that there is little signal in the Dynamite data at frequencies > 60 Hz, there is no need to use high-frequency geophones to acquire data in this area. Consequently, improved signal-to-noise would have been obtained for lines 6, 9, and 13 for depths > 8000 ft simply by using 10-14 Hz geophones, which have

good response characteristics to > 60 Hz. In fact, the Vibroseis™ data generally produced better images of folded Tertiary structure using 10 Hz geophones in the first 1.7 seconds of the section than the Dynamite data using 28 Hz geophones (step 12 in Table 4) because the wider frequency bandwidth of significant signal-to-noise with the lower frequency geophones made it possible to consistently produce a more compact wavelet and obtain better overall resolution of even shallow reflectors than the Dynamite data acquired with high-frequency geophones. The Vibroseis™ data were also acquired with a shorter group and source spacing that also decreased aliasing in regions of steep dip relative to the Dynamite data.

Geologic mapping along the ConocoPhillips line showed little relationship between observed mapped dip directions and angles and shallow apparent dips in the ConocoPhillips seismic reflection data. Consequently, a key requirement in the specification of data acquisition parameters for the 2011 field program was to include sufficiently high-resolution data acquisition parameters to properly resolve shallow, often steep dips observed in many areas of the Irish Hills.

#### *2011 Onshore 2D Seismic Reflection Field Program*

Permitting inquiries revealed that the only permitted sources would be surface sources and that drilling and explosive sources could not be permitted. Consequently, the seismic sources available for the 2011 onshore seismic reflection field program were Vibroseis™ and impact surface sources. Permitting restrictions limited source positions to roads, precluding the types of regular source geometries required to properly populate CMP bins as a function of offset and azimuth and conduct rigorous 3D imaging tests. Permits for seismic operations on public areas restricted both sources and receivers to road right-of-ways. Consequently, limited 3D imaging testing was restricted to private properties where private landowners permitted deployment of regularly-spacing receiver 2D arrays away from roads.

As is typical in the oil and gas industry when both shallow high-resolution imaging of young faults and imaging deep structures and/or reservoirs are required, two data acquisition programs were designed to meet each of these objectives. Since permitting restricted data acquisition primarily to 2D imaging along roads, both data acquisition programs were run along the same routes when possible to provide resolution of both shallow and deep structure; the large Vibroseis™ trucks could not always access areas accessible to the AWD and the AWD did not operate on some of the roads used by the Vibroseis™ trucks, so there is not uniform overlap in all areas of the two data acquisition programs.

The shallow velocities in the Tertiary Pismo syncline along ConocoPhillips line 13 were used along with a maximum frequency of 50 Hz to determine that a 30-ft group spacing would avoid aliasing associated with steep dips and surface wave aliasing for a maximum surface wave frequency of 25 Hz (surface wave amplitudes decreased substantially above 25 Hz). A third-generation 450-lb accelerated weight drop (AWD)

source was selected for shallow-high-resolution imaging tests and 2D production. This source could adjust its output force with adjustable nitrogen spring pressure so that it could operate on weak asphalt surfaces that had lost their bonding agents without producing any deflection of the road surface to ensure compliance with permits (permit compliance required no perceptible road deflection as measured with a 12-ft straight edge). The 450-lb AWD was also able to access narrower roads than large Vibroseis™ trucks to obtain shallow high-resolution data in these regions.

The 2011 field program began with a week of source testing on the DCPD facility to determine optimal production source parameters. Real-time field processing with a 2D 400-channel networked cable system was used to assess source and acquisition using 30-ft group intervals and 14 Hz geophones. AWD and Vibroseis source monitoring systems were used to measure near-source signatures and ensure precise synchronization of 4-5 Vibroseis™ trucks. Testing showed that four synchronized 64,000-lb Hemi-60 Vibroseis™ trucks provide excellent signal at offsets at least as far as 6 km. Specific Vibroseis™ testing systems were used to determine the sweep parameters that produced consistent phase lock between drive and output in a variety of surface conditions to ensure Vibroseis™ sweep stability and consistency across the entire project area. A long-duration linear sweep of 24 seconds from 5 to 60 Hz produced the best combination of good consistent long offset (> 6 km) signal-to-noise with a broad frequency bandwidth that was achievable across all the diverse geologic units in the Irish Hills necessary to achieve consistent source frequency bandwidth imaging of intermediate and deeper structure.

Initial testing within the DCPD property with the AWD showed that steep dips were generally confined to depths of < 2-3 km and that coherent 30 Hz signals from the DCPD turbines were very large within several km of the DCPD. A station spacing of 120-ft was used for the nodes that would record the large Vibroseis™ sources since it was apparent that deeper dips were generally not as steep as shallow thin-skinned structure and that deeper imaging might require restricting the data to the 5- < 30 Hz frequency bandwidth to achieve consistent signal to noise at depths of 8-18 km. A Vibroseis™ source spacing of 120 ft was used in most areas; this was decreased to 60 ft in areas where undershooting was required.

#### *2011 Onshore Field Program Findings*

Strikes and dips varying rapidly, both horizontally and in depth to 2 to 4 km throughout nearly all regions of the Irish Hills encompassed by the 2011 onshore seismic reflection program. The seismic imaging problem is truly complex and intrinsically 3D; 2D seismic reflection data acquisition is not a reliable or appropriate approach to accurately image crustal structure in this area. Systematic 3D data acquisition with rigorous population of CMP bins over a wide range of offsets and azimuths is necessary to obtain accurate images of crustal structure in the Irish Hills and adjacent areas. Multiple high-energy data acquisition geometries and source configurations are required to achieve image objectives for shallow and deep structure. The 30-ft group and source spacing used

with the AWD source and > 300 channels effectively imaged shallow (0-2 km) steep dips at all locations, except where bedding was essentially vertical, to maximum frequencies of 50 Hz. This data acquisition configuration imaging faults from the surface to 1-2 km depth identified in previous paleoseismic investigations within the DCPD property. Consequently, a group interval on the order of 30 ft will be effective in 3D high-resolution imaging to depths of several km throughout the Irish Hills region when combined with systematic wider aperture recording at a wider group spacing. A 30-ft group interval will be effective near the DCPD where shallow velocities are generally among the highest shallow velocities found in the Irish Hills region, particularly compared to slower velocities found in Tertiary rocks in the Pismo Syncline located north of the DCPD property. However, near DCPD the AWD source became less effective because DCPD coherent noise was not effectively reduced by vertically stacking AWD impacts, resulting in low signal-to-noise at offsets > 1000 m using the AWD source near the DCPD. Consequently, for 3D high-energy high-resolution imaging of shallow structure proximal to DCPD in areas inaccessible to large Vibroseis™ trucks, mini-Vibroseis™ sources should be used to allow precise phase tuning to suppress 30 Hz coherent noise. The same approach can be used with the large Vibroseis trucks to suppress the 30 Hz coherent noise. Tuning of a mini-Vibroseis™ source should be performed to evaluate nonlinear sweeps and other sweep parameters and strategies such as slip-sweep recording. Mini-Vibroseis™ sweep tuning testing is necessary to find the optimal sweep program that provides the best-balanced resolution of structure from the near surface to several km depth within several km of the DCPD. While nonlinear sweeps and/or slip-sweep methods may be appropriate for shallow imaging with the mini-Vibroseis™ trucks, linear sweeps should be used with the large Vibroseis™ trucks to ensure good long-offset signal-to-noise to obtain good images in the 4-18 km depth range.

The large Vibroseis™ trucks operated in combination with 7220 discrete nodal receiver positions provided consistent observations of good first breaks to 8-12 km offsets in most locations, and clear first breaks to a maximum offset of 19 km. A total of > 5,800,000 good quality first-breaks were picked from a possible set of 16,700,000 first breaks from all recorded source-receiver pairs that spanned an approximately 20 km by 20 km region of the Irish Hills. Near the DCPD where plant noise was highest, the large Vibroseis™ trucks provided good first-breaks at the noisiest recording sites to at least 4 km offset. Tomographic inversion with the first-breaks was used to solve for 3D velocity structure to depths of 2 to 3 km and long-wavelength and residual source and receiver statics. The 3D tomographic approach was necessary to eliminate uncertainties in first-order statics associated with shallow steep dips and complex shallow velocity and geologic structure associated with extreme topography and thin-skinned deformation that produced irregular, and often steeply dipping reflectors.

A 2D seismic reflection profile was constructed from the Vibroseis™ -node data for a region spanning Point Buchon and Point San Luis. Consistent high-quality reflections were observed to at least 13 to 14 km depth and generally extended to 17 to 18 km depth using data in the 5-25 Hz frequency band below about 3-4 km depth. Between

Point Buchon and Point San Luis, maximum offsets of 4 to 6 km provide consistent high-quality imaging to depths of about 8 to 9 km depth. Incorporating data recorded to maximum offsets of 8 to 12 km produces consistent images to about 14 to 15 km depth. The Franciscan basement exhibited persistent reflectivity to depths of 14 to 18 km throughout most of the Irish Hills. This suggests that a good rule of thumb for this region is that the maximum image depth will be approximately 1.5 times the maximum offset in the recorded data for high-energy sources such as four synchronized 64,000 lb Vibroseis™ trucks or > 3000 in<sup>3</sup> air guns. Recording of longer-offset air gun data with onshore and offshore nodes in the region between Point Buchon and Point San Luis would improve aperture and azimuthal coverage and ensure good migration performance to depths of 8 to 14 km for the region bounded by Point Buchon and Point San Luis, the Hosgri fault to the south and the southern Irish Hills within the DCPD property to the north.

3D velocities from the tomography strongly correlate with surface geology and previously inferred shallow (1 to 3 km) geologic structure used to construct the 3D velocity model used in the 2011 illumination study. The continuously recording nodes produced clear recordings of at least 18 earthquakes at receivers located throughout the entire Irish Hills survey area, representing at least 30,000-40,000 arrival times that can be used in 3D velocity-hypocenter tomographic inversions to improve resolution of crustal velocity structure below the maximum 3D tomographic imaging depths of the active source data (2 to 3.5 km). These earthquake arrival time data will provide important tomographic constraints on deeper (> 3 km depth) crustal velocity structure than is provided by the active source data and will improve migration performance at depths > 3 km relative to industry-standard processing.

The 2011 onshore high-energy testing results indicate that in near-shore locations adjacent to the DCPD onshore large Vibroseis™ sourcing should provide good signal to noise at least 4 km offshore, which would be a sufficient aperture to record the steeper dips observed in the first several km in the onshore-near-shore region proximal to the DCPD. Offshore recording of onshore Vibroseis™ sources is essential to record sufficient aperture to migrate steeply-dipping structures that trend offshore from the onshore data within 8 km of DCPD.

### Request 3

*The choice of basic parameters such as spatial sampling interval and maximum source-receiver offset should be discussed relative to the spatial resolution required to image expected target structures at depth. For instance, what spatial resolution is required to evaluate geologic markers that might provide a measure of fault slip rate?*

### Response 3

The NRC places a high emphasis/importance on mapping shallow, near surface geologic investigations in order to constrain the geomorphic expression of potentially

significant and capable seismic sources. Low Energy Seismic Surveys (LESS) rather than High Energy Seismic Surveys (HESS) are the preferred tool to evaluate fault slip rate. Offsets of recent geomorphic features can be measured and dated to provide estimates for fault slip rates. These data serve as the control for estimating the rates and magnitudes for design earthquakes.

HESS surveys can provide information about the deeper geometry of seismogenic faults in the area and help constrain the source characterization of these structures. The basic acquisition parameters for the proposed 2012 HESS study are summarized in Table 5. Spatial resolution (as expressed by bin sizes) for the marine LESS studies that were conducted off of Point Buchon and in San Luis Bay were 1.56m x 3.125 m and 3.125 m x 3.125 m, respectively. Bin sizes for the HESS studies, dictated by streamer group intervals (12.5 m) and cross line spacing (100m to 150 m) are estimated to be 6.25 m x 25 – 37.5 m, respectively.

**Table 5 Proposed HESS Acquisition Parameters**

Survey Area	614 km <sup>2</sup>
Source	Two (2) 3300 in <sup>3</sup> arrays, 9m tow depth
Recording	Syntrack
Streamer	4 x 6000m solid Sentry streamers, 100 - 150 m cross line spacing, 9 m tow depth
Channels per Streamer	468
Group Interval	12.5 m
Maximum Offset	6000 m
Shot Spacing	37.5 m flip flop (75m per source)
Shot Interval	37.5 m
Source / Streamer Location Accuracy	Source 1 -2 m / Tail buoy 7-12 m
Record Length	10 seconds
Bin Size	25 - 37.5m x 6.25m
Sample Rate	2msec
Fold	40

Request 4

*The choice of towing only 4 streamers in the offshore survey should be evaluated. Typical industrial surveys deploy 10 or more streamers to improve survey efficiency (i.e., reduced acquisition time). This should be a significant issue for the proposed survey, which has been analyzed to have significant impacts to marine life, based on time exposure to the seismic source.*

Response 4

Today's industry design and practice is heavily guided by the specifics of the intended target. During the past decade, the energy sector has experienced a significant move towards subsalt imaging in deep water (water depths in excess of 5000 ft, target depths in the 20,000 ft range and beyond); this operational mode is especially true for the Gulf of Mexico, offshore Brazil, and West Africa. For efficiency in regions with little or no operational hazards (such as shallow seafloor outcrops), combined with significant target depths, the industry developed a new breed of vessels, including "ramform" designs, that can tow up to 10-14 streamers with dual flip-flopping sources. In an appropriate environment, this strategy can reduce data collection time by a factor of 2 or 3—although a significant increase in the day-rate cost is realized for such vessels. Nevertheless, there are downsides to this approach. First, with respect to water depth, operations of "ramform" and similar boats are limited to water depths greater than 75 m. For comparison purposes, vessels towing 4 to 6 streamers with dual source arrays can survey into water depths of 25 m or greater. Offshore Diablo Canyon, this operational limitation would force a vessel towing 10 to 14 streamers to move offshore by an additional 2 to 4 km (from northwest to southeast). This attempt at efficiency would not only significantly increase the width of the transition zone between marine and land surveys, but would also compromise imaging quality along the Hosgri Fault (due to a migration aperture width that would overlap the intended target, creating an imaging problem at depth). Second, increasing the width of the array would also introduce unintended imaging problems, especially for shallowest sections of the crust as a wide variety of azimuths at a given location are needed to construct an image, which can be problematic (e.g., such as back tracking anisotropic effects). Third, for shallow targets, the lack of near offsets within certain bins can obscure shallow imaging of important targets such as faults. A better strategy would encompass two overlapping 3D surveys, with a narrower array (4 to 6 streamers), but shot along sail-lines from different azimuths, as is proposed for Boxes 2 and 4 in Figure 1. Ultimately, it is unsafe to use vessels towing 10 to 14 streamers given seafloor depths offshore Diablo Canyon, and the need to image structures from the Hosgri Fault toward the shoreline. Finally, the importance of both shallow and deep target imagings requires an approach that is not solely focused on the deeper subset.

PG&E's Request for Proposals (RFP) for the HESS project initially specified 6 to 12 streamers of 4 to 8 km length or offset for the HESS. The original racetrack design for the HESS was based on a minimum operating water depth of 50 m, which

acknowledged safety concerns about operating in shallow water (presence of nearshore shallow rock outcrops, kelp beds, and other navigation obstacles). Input from the IPRP suggested extending the survey closer to shore, in shallower waters. Consultation with Columbia University Lamont-Doherty Earth Observatory, operators of the *R/V Langseth*, indicated that a safe operating depth could be extended to the 25 m contour for a closer approach to shore.

The minimum operational water depth for 10 or more streamer vessels is 75 m (3x deeper than identified for the *R/V Langseth*, 25 m) due to the depths of the lead-ins both online and in the turns. Operating at these depths would preclude imaging many of the near shore targets identified in the CCCSIP. The turning radius for a ten streamer vessel is 4 to 5 km vs. 2.5 km for a four streamer vessel. With the exception of Box 2, the 10 streamer line changes for Boxes 1 and 4 could be as long as the lines themselves and would impede navigation in tight areas such as Estero Bay. Shorter turns will allow more online or production time.

Ten streamer vessels are larger, require more deck space for equipment, tend to burn more fuel due to increased resistance (introducing additional air quality issues) and require a larger turning radius. Simply stating that 10-streamer multi-channel seismic (MCS) vessels are more efficient is not applicable to all environments, especially shallow-near shore environments. In fact, there might be no efficiency in survey time realized given the above considerations. The additional risk involved in using larger vessels in shallow coastal waters would also result in additional charges and risk premiums, as well as significant expense (i.e., millions of dollars) to mobilize/demobilize these vessels and equipment to the central coastal California area.

As noted above, the original RFP specified consideration of vessels capable of towing 6 to 10 streamers. Feedback from bidding and non-bidding firms concluded that the smaller vessels with less streamers were appropriate for the constraints of this location and this survey

#### Request 5

*The potential benefit of data acquisition over a wide (in contrast to the proposed narrow) source-receiver azimuth range should be evaluated for both image quality improvement and the ability to evaluate the orientation of maximum horizontal stress.*

#### Response 5

Collecting 3-D using a wide-swath geometry (e.g., 10 to 14 streamer configurations) is typically seen as a negative as anisotropic effects may need to be accounted for to produce a clean, crisp image. Nevertheless, constraining crustal anisotropy can help better understand the pattern of strain (not stress) in the crust, and hence, the history of deformation. The measurement of stress in the crust is elusive and certainly not the purview of the reflection seismology technique. See response to Request 7 below. A

better acquisition strategy would consist of overlapping 3-D survey boxes (e.g., Boxes 2 and 4 in Figure 1), shot from different azimuths, using a narrow footprint of towed streamers to ensure both safety, the ability to image the shallow most sections of the crust, and estimate crustal anisotropy.

Request 6

*The proposed seismic data processing flow, data processing contractor and experience should be specified.*

Response 6

A number of industry contractors have been identified to conduct both the onshore and offshore seismic data acquisition and processing for the CCCSIP. All of the work performed will be in compliance with Nuclear Quality Assurance (NQA-1) requirements as stated in 10 CFR 50, Appendix B and 10 CFR 21. The proposed processing flow for the 3D Diablo Canyon project will embody the latest, cutting-edge seafloor multiple removal and seismic imaging techniques (among a myriad of recent advancements) that are currently available within industry processing shops.

**Marine Navigation Processing:** NCS SubSea (Houston, TX; <http://www.ncs-subsea.com/>) will be responsible for the 3-D streamer navigation using Concept Systems' Spectra, Sprint and Reflex modules to provide the highest standard of streamer navigation. The flow chart in Figure 1 illustrates the software used, QC steps, and the outputs generated in industry data exchange formats for raw (P2/94) and processed (P1/90) navigation and positioning data

NCS Subsea has worked with Fugro and PG&E on the 3D Low Energy Seismic Survey (LESS) work offshore DCP in 2010, 2011 and the upcoming 2012 PCable survey in August 2012.

**Marine Seismic Data Acquisition and Processing:** Contractors from well-established firms such as Fugro Geoteam (Houston, TX; <http://www.fugro-geoteam.com/>) and/or GeoTrace (Houston, TX; <http://www.geotrace.com/>) will be onboard the *R/V Langseth* during acquisition and will be responsible for all data QC and QA. This oversight will include careful inspection of trace amplitudes for all shots, potential effects of swell noise, dynamic 3D binning of data volume, etc. Table 6 and Figure 2 show an example of the data processing flow that will be used for the marine HESS. Post-cruise, the latest industry processing toolkits will be used to produce both 3D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic Imaging and/or GeoTrace. Recent advances in full 3D tomography and waveform inversion (FWI) techniques will also be applied to these new data.

**Table 6 Typical 3D Marine Processing Flow**

Reformat  
De-signature to zero phase using filter designed from supplied far field signature  
Bandpass filter  
Resample Gun and cable static correction  
Velocity analysis @ 4x4 km  
Gain recovery  
*Targeted FK filter (shallow water only)*  
Time-frequency denoise (shot and receiver station domains)  
K dealias  
Tau-p mute direct arrival attenuation  
3-D SRME  
Velocity analysis @ 4x4 km  
Time-frequency denoise (shot and CDP domains)  
*Shot domain tau-p deconvolution and tau-p mute (shallow water only)*  
*Receiver domain tau-p deconvolution and tau-p mute (shallow water only)*  
Sort to CDP  
Velocity analysis @ 2km x 2km  
*Targeted FK filter (shallow water only)*  
Hi-resolution radon de-multiple  
Q compensation (phase only)  
*Time-frequency denoise*  
*Sort to offset domain*  
*Predictive deconvolution (shallow water only)*  
*Bin*  
Tidal correction  
Residual water column statics  
Pre-stack time migration  
Target migration lines 1 x1 km  
Build migration velocity model  
Interpolate to 12.5 x 12.5 m  
Pre-stack time migration (curved ray)  
Residual parabolic radon de-multiple  
Automatic residual velocity determination (every CDP)  
Normal moveout correction  
Mute  
Stack  
*Low frequency boost*  
Post stack filtering  
Bandpass filter  
Scaling

**Onshore Seismic Data Acquisition and Processing:** Onshore, Nodal Seismic (Signal Hill, CA; <http://www.nodalseismic.com/> ) and Bird Seismic Services (Globe, AZ; <http://www.birdseismic.com/> ) will be conducting the onshore data collection in 2012, as a continuation of onshore studies conducted in and around the Irish Hills in 2011 and as part of the Transition Zone imaging. Nodal Seismic will be responsible for operation of Vibroseis and Zland nodal data collection, and Bird Seismic will be responsible for high-resolution shallow data collection. Instrument specifications fro the Zland nodals can be found at <http://www.fairfieldnodal.com/Products/ZLand/specs.html>. Onshore data processing will be overseen by Fugro Consultants, Inc. (Denver, CO; <http://www.fugroconsultants.com>). Table 7 shows an example of the onshore data processing flow. As in the case of the marine multi-channel 3D data collection, post-survey analysis will use the latest industry processing toolkits to produce both 3D prestack time migration and prestack depth migration imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic imaging and/or GeoTrace. Recent advances in full 3D tomography and waveform inversion (FWI) techniques will also be applied to these new data.

**Table 7** Typical processing flow for land data including a mix of source types

Reformat
Geometry build and apply
Recording delay correction (separate correction for each source type)
Refraction static calculation
Gain Recovery
Linear noise suppression
Random noise suppression
Surface Consistent Deconvolution (with minimum phase conversion for Vibroseis™ data)
First-break picking
3D tomography
Full-waveform inversion (FWI)
3D solution for long wavelength and residual statics
Refraction static application
Velocity Analysis – one-mile grid
NMO application / Mute first breaks
Residual statics
Velocity Analysis – 2 <sup>nd</sup> pass
Residual statics (2 <sup>nd</sup> pass)
Surface consistent scaling (shot and receiver)
Linear noise suppression
Random noise suppression
Migration velocity analysis – half-mile grid(inline and cross line)
Pre-stack Kirchhoff time migration
Post-migration velocity analysis
NMO – Mute – CMP stack
Post-stack filtering, noise suppression
Pre-stack depth migration

**Transition Zone Data Collection and Processing:** FairfieldNodal (Sugar Land, TX; <http://www.fairfieldnodal.com/> ) will be responsible for the Transition Zone data collection using up to 600 Z700 marine nodes. Instrument specification for the Z700 Nodals can be found at <http://www.fairfieldnodal.com/Products/Z700/specs.html> Figure 3 shows an example of the Transition Zone 3D data processing flow. As in the case for both the onshore and marine multi-channel data, post-survey analysis will use the latest industry processing toolkits to produce both 3-D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro and/or GeoTrace. Recent advances in full waveform inversion (FWI) techniques will also be applied to these new data.

Request 7

*The potential benefit of evaluating vertical fracture alignment, maximum horizontal stress, and directional stress inequality should be discussed. While this information is not typically used in traditional seismic hazard analysis, it does relate to the physical state of the overall seismo-tectonic setting.*

Response 7

The evaluation of tectonic stress and strain are components of the seismic hazard analysis that is currently being conducted as part of the Senior Seismic Hazards Advisory Committee (SSHAC) process.

Principal stress directions can be determined from the evaluation of earthquake focal mechanisms and borehole hydro fracture data. Analysis of seismicity and earthquake focal mechanisms in the central coastal area indicates that the principal compressive stress direction,  $\sigma_1$  is N15°E  $\pm$  4° north of latitude 35°N and N47°E  $\pm$  15° south of latitude 35°N. As seen in Figure 4, this direction is consistent with a uniform NE-SW maximum horizontal stress orientation from borehole break out data in the area and the overall pattern of recent transpressional tectonic deformation (McLaren and Savage, 2001, *Seismicity of South Central Coastal California: October 1987 through January 1997*, *Bull. Seismological Society of America*, 91, 1629-1658)

Request 8

*The specific acquisition parameters and processing sequence of the transition zone survey should be discussed. Of particular importance would be the processing proposed to assure a high-quality seismic image after merging the transition zone data with the onshore and offshore survey data.*

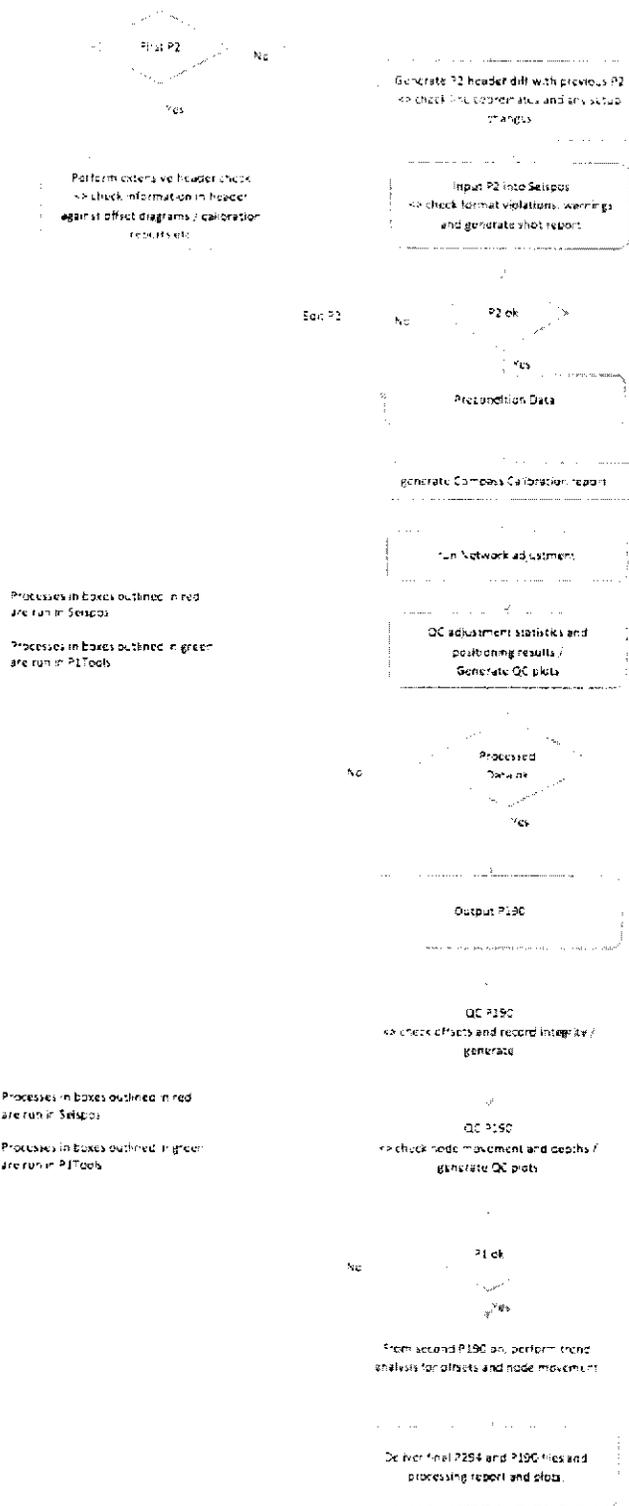
Response 8

The central segment of the Shoreline fault zone, between DCPD and Point San Luis, lies within the Transition or Intertidal Zone, where water depths are less than 25 m. As shown in Figure 1, the Transition Zone widens south of DCPD towards Point San Luis and the HESS Box 1 racetrack is oriented at angle to the coastline. PG&E has proposed to undershoot this gap in coverage by placing a series of marine nodes on the seafloor and using both marine airguns and onshore Vibroseis™ sources. The Draft EIR specified a deployment of 600 Z700 marine nodes placed in a series of five transects perpendicular to the coast with 50 m spacing between nodes. See Figure 1 for node transect locations. Instrument specification for the Fairfield Nodal Z700 Nodes can be found at <http://www.fairfieldnodal.com/Products/Z700/specs.html>

PG&E is currently working with industry seismic processing companies to update the 2011 Illumination study, based on improved velocity models from 2011 onshore survey, to optimize marine node placement as well as onshore and offshore imaging capabilities. Recognition of environmental restrictions, including placement of nodes on hard (rocky) bottom, avoidance of protected species, etc. need to be addressed before the final node configuration is established.

A processing flow of these Transition nodal data is shown in Figure 4. Once these data are processed they will be integrated with the onshore and offshore data to develop a comprehensive 3D volume of the study area for interpretation.





**Figure 2** Typical Marine Seismic Navigation Data Processing Flow  
 P2/94: Industry data exchange format for raw navigation and positioning data for seismic surveying  
 P1/90: Industry data exchange format for processed navigation and positioning data for seismic surveying. The P190 provides the processed position for each channel/group. SeisPos: Commercial software package for QC and processing of navigation and positioning data for seismic surveying.  
 P1Tools: The QC component of the SeisPos software package.

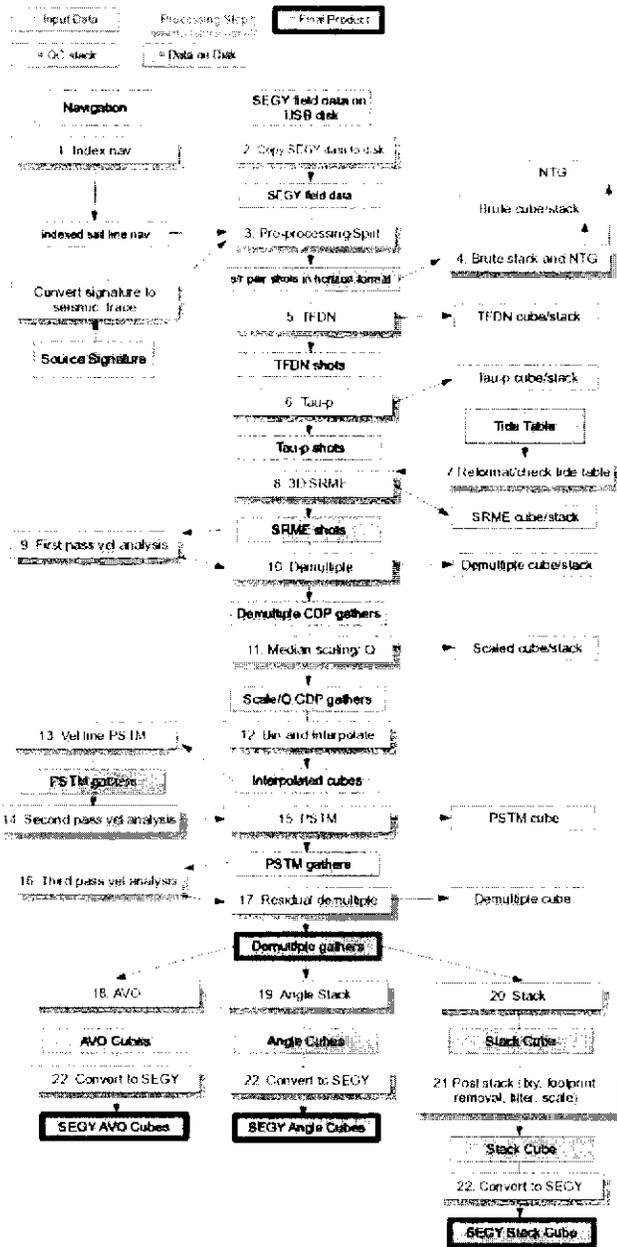
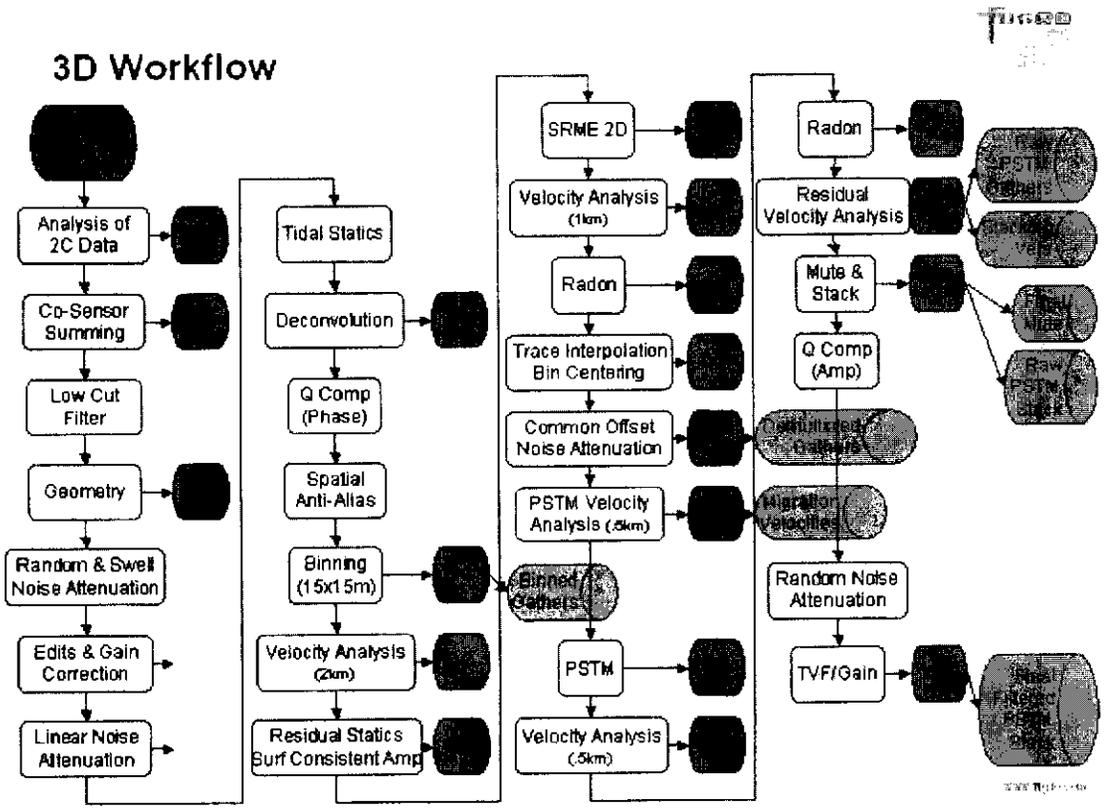
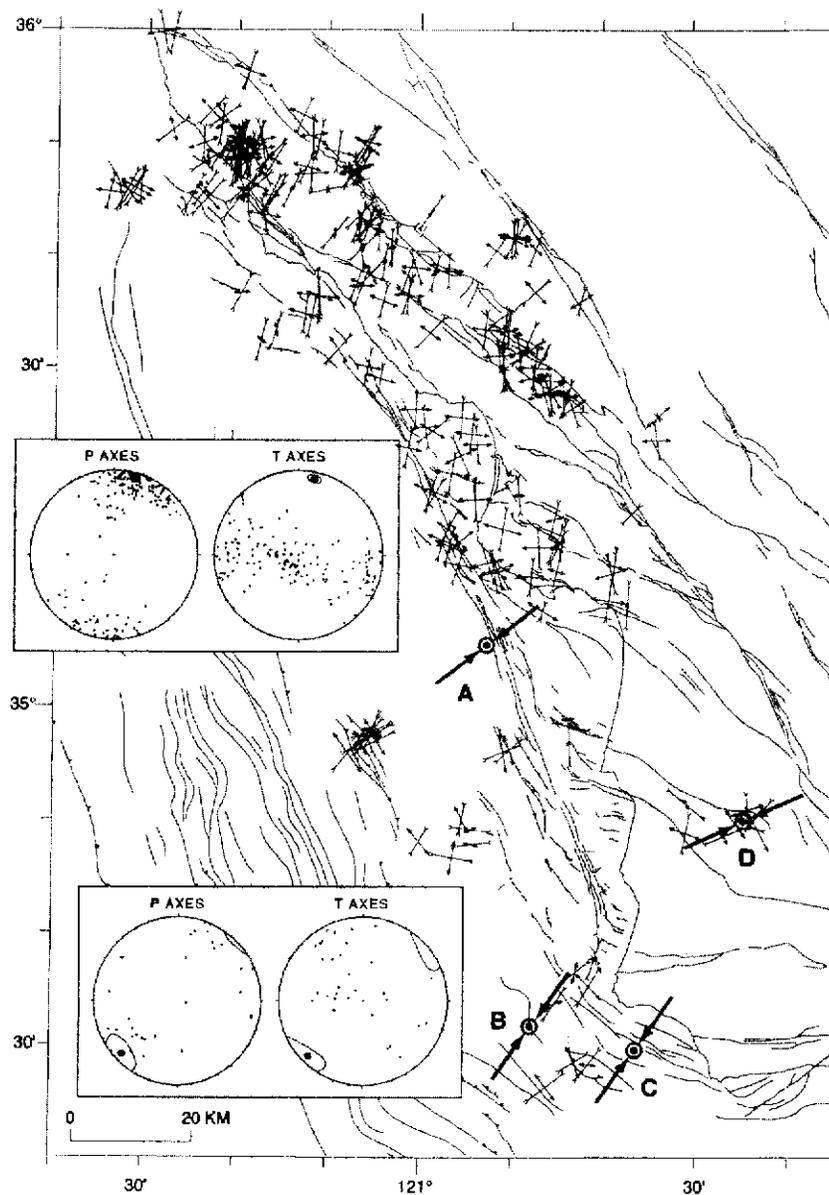


Figure 3 Typical 3D Marine Processing Flow



**Figure 4** Typical Transition Zone Processing Flow.

Note the co-sensor summing - this is utilizing multiple components in an Ocean Bottom Node or Cable to remove receiver ghosts.



**Figure 5** Horizontal surface projections of P and T axes from earthquake focal mechanisms. Encircled solid circles are locations of borehole breakout data. The two insets are stereo net plots of the distribution of P and T axes of the fault plane solutions for earthquakes in the northern and southern regions (i.e., north and south of 35°N). From McLaren and Savage, 2001.

## ATTACHMENT 3

July 29, 2012

### SUMMARY OF UNRESOLVED TECHNICAL ISSUES

The following sections include summary technical discussion of some issues remaining unresolved after discussions at the IPRP and the exchange of letters in Attachments 1 and 2.

#### Number of streamers

The proposed survey includes 4-streamer vessel operations in water as shallow as 25 m, in order to cover targets near shore. PG&E asserts (Attachment 2, pg 13) that boats capable of towing 10 or more streamers cannot operate in water depths shallower than 75 m. Recent communication from one industry seismic contractor indicates that a 10-streamer boat can operate in 25-m water depths under nominal conditions.

This project should be submitted for a complete survey design review that would include a navigational obstruction survey of the area and modeling of streamer tracking behavior (horizontal and vertical) based on modern streamer steering and control technology. The survey design review would assess data collection efficiency, including 1) the potential use of greater numbers of streamers, and 2) the application of a second shooting boat, which is a common industry practice that improves data collection efficiency and image quality as well.

As in other issues listed below, the survey design should aim to delineate the survey best suited to accurately image the expected targets. Only after that determination, should issues of feasibility, cost and schedule be considered in modifying survey design.

#### Transition zone data collection and processing

The Shoreline fault, a particularly important target of the survey, is overlain by shallow water and lies close to the shoreline (in the "transition zone"). PG&E's onshore surveys have identified steeply-dipping and complex structures of interest in this area. Gaining a high-quality image of these features in a transition zone environment will be challenging.

In this case shallow water receivers (nodes) are proposed along 5 irregularly spaced and oriented lines. While plots of common-midpoint coverage have been offered, there remain questions about whether this survey geometry can image the structures of interest.

Industry standard transition zone survey design would have modeled the seismic response of expected targets and adjusted survey geometry and data processing flow to assure image quality. The data processing flow is particularly important if data from the

transition zone survey are to be merged with onshore and offshore data in a single data volume.

#### Spatial sampling and shooting along strike

The IPRP has suggested eliminating the northernmost part of the survey (Box 3) because little new seismic hazard information was expected to be obtained (IPRP Report #3). In their response to the IPRP, PG&E disagrees, arguing that further survey of the Hosgri-San Simeon fault intersection could reveal important geologic detail.

Note that the survey direction of Box 3 (Attachment 2, Figure 1) is along the strike of the Hosgri-San Simeon faults. PG&E argues that this shooting orientation is necessary because shallow water near the shoreline constrains boat maneuvering. Strike line shooting is less preferred because the important geologic changes occur in the perpendicular (dip) direction (Attachment 2, pg 4).

The cross-line bin size of the HESS is nominally 25-37m. PG&E discusses in Attachment 2 that the onshore data show optimal group interval is closer to 10 m. Thus, the adequacy of the cross-line (dip direction) sampling in Box 3 (and other areas shooting along strike) should be reviewed.

As with other issues above, a comprehensive survey design approach would model the expected reflection response for the proposed survey geometry and processing sequence to confirm that features could be adequately imaged. This should be especially important in the northernmost area of the survey, where geologic details are to be assessed. A second shooting boat and streamer track overlap could also benefit cross-line resolution and should be studied.

#### Data processing coordination

Industry standard survey design integrates data acquisition, processing and interpretation. PG&E has helpfully listed numerous potential processing contractors and steps that appear to be state of the art (Attachment 2).

Given that, 1) data processing flows are listed as "typical" (not currently determined), 2) the expected data processing flow is complex, and 3) multiple surveys comprise the overall CCCSIP, a clear sense of how different data processing steps are coordinated is important. In particular, PG&E should identify who has the responsibility and authority to evaluate processing quality and make processing flow decisions.



## AVILA BEACH COMMUNITY SERVICES DISTRICT

Post Office Box 309, Avila Beach, CA 93424  
Office and Meeting Room - 191 San Miguel Street, Avila Beach  
Telephone (805) 595-2664 FAX (805) 595-7623  
E-Mail [Avilacsd@gmail.com](mailto:Avilacsd@gmail.com)

California Coastal Commission  
725 Front Street Suite 300  
Santa Cruz, CA 95060

Subject: Resolution of the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project

Honorable Commissioners:

Attached for your records is a Resolution from the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project.

Please consider the District's concerns in your deliberations relating to the Seismic Imaging  
Project.

Sincerely,

Peter Kelley  
President

**AVILA BEACH COMMUNITY SERVICES DISTRICT  
RESOLUTION 2012-09**

**A Resolution of the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project**

WHEREAS, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing from November 1, 2012 through December 31, 2012 in and around the waters of Avila Beach; and

WHEREAS, the Avila Beach Community Services District has concerns regarding the proposed testing; and

WHEREAS, those concerns include the extension of recreational rockfish season to December 31, 2012, the potential deleterious effects on fish, and Marine mammals; and a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and

WHEREAS, the project has not adequately addressed the land side impacts related to fishing that include, but are not limited to, reduced tourism, reduced availability of fish for restaurants and other environmental issues; and

WHEREAS, the project has not identified an adequate mitigation and claims process for those affected; and

WHEREAS, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

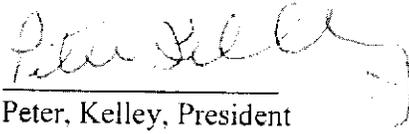
NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the Avila Beach Community Services District, San Luis Obispo County, California, as follows:

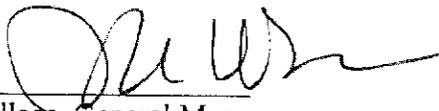
That the Avila Beach Community Services District does hereby oppose the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

Upon Motion of Director Kelley, seconded by Director Janowicz, and on the following roll call vote to wit:

AYES:	Kelley, Janowicz, Rowe
NOES:	None
ABSENT:	One Vacancy
ABSTAINING;	Yoder

The foregoing Resolution 2012-09 Opposing the Central Coastal California Seismic Imaging Project is hereby adopted this 9<sup>th</sup> day of October 2012.

  
\_\_\_\_\_  
Peter, Kelley, President

ATTEST:   
\_\_\_\_\_  
John L. Wallace, General Manager



October 29, 2012

**DIRECTORS:**

Allan S. MacKinnon  
*President*

Michael Thompson  
*Vice President*

James Bahringer  
*Director*

Muril N. Clift  
*Director*

Gail Robinette  
*Director*

Mary Shallenberger  
Chair, California Coastal Commission  
North Central Coast District Office  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

**SUBJECT:** PG&E Offshore High-Energy Seismic Study  
(November 2012 – Coastal Committee Meeting Agenda Item)

Dear Commissioners:

As part of the October 25, 2012 regular meeting agenda, the Cambria Community Services District Board of Directors discussed and directed staff to draft a comment letter for submittal to the California Coastal Commission opposing PG&E's proposed Central Coastal Seismic Imaging Project as currently proposed.

**OFFICERS:**

Jerry Gruber  
*General Manager*

Timothy J. Carmel  
*District Counsel*

Kathy A. Choate  
*District Clerk*

PG&E's once 540-square-mile Offshore Central Coastal California Seismic Imaging Project in its revised proposal has been reduced to cover 129 square miles off the coast of Estero Bay from Port San Luis to Morro Bay; an area adjacent to the Monterey Bay National Marine Sanctuary, the largest national marine sanctuary and one of the largest marine protected areas in the United States. Dozens of endangered species use these waters and the loud sounds emitted by the air guns could injure marine wildlife or drive it away from the area. This area is a most treasured and protected area of marine life.

Local coastal opponents of the test maintain it violates the California Coastal Act, and dispute PG&E's low risk assessment of injury and mortality to marine life and mammals, the damage to the ecosystem, as well as to the fishing industry and economy of the much treasured Coastal area from Port San Luis to Morro Bay.

The Cambria Community Services District Board of Directors joins other local governmental entities; including the City of Morro Bay, San Simeon Community Services District, SLO County North Coast Advisory Council, and Monterey County Board of Supervisors, in opposition to PG&E's Central Coast Seismic Imaging Project.

Sincerely,

Allan S. MacKinnon  
Board President

c: San Luis Obispo County Board of Supervisors

# MONTEREY COUNTY

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## BOARD OF SUPERVISORS

FERNANDO ARMENTA, *Vice Chair, District 1*

LOUIS R. CALCAGNO, *District 2*

SIMÓN SALINAS, *District 3*

JANE PARKER, *District 4*

DAVE POTTER, *Chair, District 5*

October 12, 2012

Mary Shallenberger  
Chair, California Coastal Commission  
North Central Coast District Office  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

**SUBJECT: PG&E Offshore High-Energy Seismic Study  
(November 2012 - Coastal Committee Meeting Agenda Item)**

Dear Chair Shallenberger:

On behalf of the Monterey County Board of Supervisors, I am writing to express our concerns regarding the Pacific Gas & Electric (PG&E) proposal for offshore high-energy seismic study near the Diablo Canyon Power Plant.

While we are concerned with the seismic safety of the region surrounding PG&E's Diablo Canyon Nuclear facility, those concerns must be balanced with the disturbance of marine mammals and fish in the environmentally sensitive survey areas.

PG&E plans to use the research vessel *Langseth* to tow an array of air guns through the waters that include two state marine protected areas which is adjacent to the Monterey Bay National Marine Sanctuary, the largest national marine sanctuary and one of the largest marine protected areas in the United States. The air guns emit loud sounds into the ocean that penetrate Earth's crust resulting in three-dimensional images of the earthquake faults near Diablo Canyon which are intended to give seismologists a better picture of the seismic danger facing the nuclear power plant. However, dozens of endangered species use these waters and the loud sounds emitted by the air guns could injure marine wildlife or drive it away from the area (McCauley, R.D. et al 2000).

One of the main concerns is that the high-energy sound blasts could disturb and/or damage animal life, particularly cetaceans such as whales, porpoises and dolphins, all of which use the area off of the Central Coast as a migratory route to and from their annual feeding and birthing areas. Marine mammals such as whales, porpoises and dolphins use sonar and hearing to navigate and communicate, such seismic testing could damage their sensitive systems leading them off-route and possibly missing critical milestones along their routes putting them at risk to be in the wrong areas at the wrong time of the year.

We request that PG&E seek alternatives to the manner in which it researches potential seismic safety concerns so that to the maximum degree practical these efforts protect and respect the marine protected areas and Monterey Bay National Marine Sanctuary, thereby preserving the environment and economic viability of our pristine coastal areas while simultaneously safeguarding the public.

Sincerely,



Dave Potter, Chair  
Monterey County Board of Supervisors

cc: Congressman Sam Farr  
Senator Dianne Feinstein  
Senator Barbara Boxer  
Governor Gerald Brown  
Assembly Member Luis Alejo  
Assembly Member Bill Monning  
Senator Anthony Cannella  
Senator Sam Blakeslee  
John Laird – Secretary, California Resources Agency  
Monterey County Board of Supervisors  
Lew C. Bauman – CAO, Monterey County  
Charles J. McKee – County Counsel, Monterey County  
Benny Young – Director, Resources Management Agency, Monterey County  
Nicholas E. Chiulos – Director, Intergovernmental & Legislative Affairs, Monterey County  
Clerk of the Board, Monterey County  
John E. Arriaga – JEA & Associates  
Brent R. Heberlee – Nossaman LLP

# *Coastal San Luis Resource Conservation District*

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645 Main Street Suite F Morro Bay, CA 93442 (805)772-4391 (fax)772-4398

October 8, 2012

Honorable Commissioners of the  
State Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA. 94105-2219

**R E C E I V E D**

**OCT 12 2012**

CALIFORNIA  
COASTAL COMMISSION

**RE: Comments on the Request by Pacific Gas and Electric Company to Conduct Acoustical Seismic Testing off the Coast of central San Luis Obispo County**

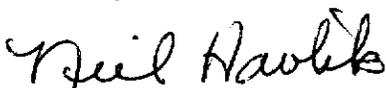
Dear Commissioners:

The Coastal San Luis Resource Conservation District (CSLRCD) is an independent special district whose mission is to protect and enhance the natural and agricultural resources found within the district boundaries. Those boundaries include the Pacific Ocean shoreline from the northern city limit of the City of Morro Bay all the way south to the San Luis Obispo-Santa Barbara County line. We do not comment upon projects affecting these resources to simply urge denial of such projects, but rather to offer recommendations intended to make them better. We offer this letter in that spirit.

CSLRCD accepts the fact that the Diablo Canyon Nuclear Power Plant is a significant physical and economic feature of the Central Coast, that it is likely to remain so for a long time, and that it is of paramount importance that the best and most up-to-date information on the hazards associated with the plant and its coastal location be in possession of decisionmakers at all levels. Having said that, however, we remind the Commission that the Central Coast is noted for its great beauty and for the great diversity of wildlife—including marine wildlife—found here. The potential for damage to marine wildlife is certainly present and as reported in the media, may be very great. The need for the best available information about seismic hazards must therefore be weighed in some measure against the potential for harm to the rich marine wildlife of the area.

For example, if a less impacting technology can obtain 90% or more of the needed information, or obtain it with 90% of the accuracy of a more impacting technology, should that less impacting technology be used? We do not know the answer to such a question, but urge that it be asked, and if it has been asked, that it be asked again before committing to a given approach. We would urge the Commission—and the applicant, Pacific Gas and Electric Company—to be absolutely certain that the testing methodology is the best methodology available, and that the information obtained from that methodology is the least harmful to the natural environment of the area.

Sincerely,



Neil Havlik, PhD., President, Board of Directors  
Coastal San Luis Resource Conservation District



# City of Morro Bay

Morro Bay, CA 93442

(805) 772-6205

**RECEIVED**

September 21, 2012

SEP 25 2012

California Coastal Commission  
Deputy Director Dan Carl  
725 Front Street, Ste. 300  
Santa Cruz, CA 95060-4508

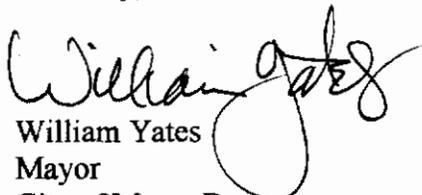
CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

RE: City of Morro Bay's Strong Opposition to the Central Coast Seismic Imaging Project

Dear Mr. Carl:

The City of Morro Bay, at their regular City Council meeting held Tuesday, September 11, 2012 unanimously passed Resolution 49-12, opposing the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas & Electric. We have attached that Resolution in hopes that you take into consideration our many concerns that PG&E has yet to address.

Sincerely,

  
William Yates  
Mayor  
City of Morro Bay

Attachment: Resolution 49-12, "Resolution of the City Council of the City of Morro Bay, California Opposing the Central Coastal California Seismic Imaging Project"

FINANCE  
595 Harbor Street

ADMINISTRATION  
595 Harbor Street

FIRE DEPT.  
715 Harbor Street

PUBLIC SERVICES  
955 Shasta Avenue

HARBOR DEPT.  
1275 Embarcadero Road

CITY ATTORNEY  
595 Harbor Street

POLICE DEPT.  
850 Morro Bay Boulevard

RECREATION & PARKS  
1001 Kennedy Way

**RESOLUTION NO. 49-12**

**RESOLUTION OF THE CITY COUNCIL  
OF THE CITY OF MORRO BAY, CALIFORNIA  
OPPOSING THE CENTRAL COASTAL CALIFORNIA  
SEISMIC IMAGING PROJECT**

**THE CITY COUNCIL  
City of Morro Bay, California**

**WHEREAS**, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing from November 1, 2012 through December 31, 2012 in and around the waters of Morro Bay; and,

**WHEREAS**, the City of Morro Bay sent a letter to the California State Lands Commission regarding the Draft Environmental Impact Report outlining numerous concerns; and,

**WHEREAS**, those concerns included the extension of recreational rockfish season to December 31<sup>st</sup>, the short-term, long-term and permanent effects on fish, fishing, and fish stocks; the short-term, long-term and permanent effects on marine mammals; a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and, the inability for vessels to leave and enter the Morro Bay Harbor; and,

**WHEREAS**, the project has not taken into consideration the land side impacts related to fishing that include, but are not limited to, reduced fish landing and processing activity, fish availability for restaurants, tourism and other environmental issues; and,

**WHEREAS**, the project has not identified an adequate mitigation and claims process for those affected; and,

**WHEREAS**, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

**NOW, THEREFORE, BE IT RESOLVED**, that the City of Morro Bay opposes the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

**PASSED AND ADOPTED** by the City Council of the City of Morro Bay at a regular meeting thereof held on the 11<sup>th</sup> of September 2012, by the following vote:

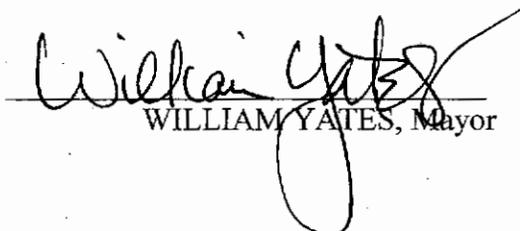
AYES: Borchard, Johnson, Leage, Smukler, Yates

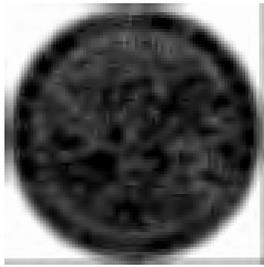
NOES: None

ABSENT: None

ATTEST:

  
JAMIE BOUCHER, City Clerk

  
WILLIAM YATES, Mayor



DEPARTMENT OF PLANNING AND BUILDING

September 11, 2012 (2<sup>nd</sup> UPDATED 11:32 AM)

Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont St. Suite 2000  
San Francisco, CA 94105

SUBJECT: Consolidated permitting for the PG&E Seismic Imaging Project

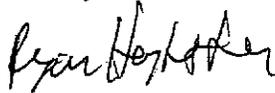
Dear Mr. Teufel:

On behalf of Pacific Gas and Electric, the County of San Luis Obispo is requesting that the portions of the PG&E Seismic Imaging Project within the County permit jurisdiction be considered for combined processing by the Coastal Commission. Per §30601.3 of the California Coastal Act, the Coastal Commission may process and act upon a consolidated coastal development permit application, if the proposed project requires a coastal development permit from both a local government with a certified local coastal program and the commission, and the applicant, the appropriate local government, and the commission, which may agree through its executive director, consent to consolidate the permit action, provided that public participation is not substantially impaired by that review consolidation.

As you know, PG&E is proposing to conduct seismic imaging along the central coast region within a defined project area (see attachment from PG&E titled Expanded Project Description August, 30, 2012 for which this letter is based). Portions of the seismic imaging project have already been reviewed by the County last fall and have been determined to be exempt from requiring a Coastal Development Permit (see attached letter dated May 20, 2011). The work which was determined to be exempt included vibrosis trucks and nodes within County right of ways, and it is the County's understanding that this work has been completed to date. Additional work however, includes installing nodes within the State Parks jurisdiction of the sand areas in Morro Strand which were not exempted from requiring a permit. This additional work in the sand include installation of 100 nodes (by hand) along the sand-spit of Morro Strand. It is this additional work within the County permit jurisdiction that is being requested in this letter for combined processing.

Thank you for consideration of this request. Can you please confirm that the Coastal Commission will process and act upon a consolidated coastal development permit application for the project described above. Please call me at 805/788-2351 if you would like to discuss this further.

Sincerely,



Ryan Hostetter  
Planner III  
Coastal Team

Cc: Kris Vardas, PG&E

Attachments: Latest Expanded Project Description (revision 8 August 30, 2012)  
Letter from County Planning dated May 20, 2011



## 1.0 EXPANDED PROJECT DESCRIPTION

The following updated project description was prepared by Pacific Gas and Electric Company (PG&E) in support of the proposed Offshore Central Coastal California Seismic Imaging Project (Project). This update reflects revisions to the project that have resulted as part of the permitting process and in particular the recent California State Lands Commission project approval which resulted in the elimination of portions of the originally planned survey area and the expansion of the project to a two year work window. All Project related activities will occur within the central area of San Luis Obispo County, California (Figure 1-1). The following summarizes the proposed offshore deep seismic data collection survey operations proposed for 2012.

### 1.1 PROJECT TITLE

Offshore Central Coastal California Seismic Imaging Project

### 1.2 PROJECT APPLICANT'S NAME AND ADDRESS

Pacific Gas & Electric Company  
Mr. Jude Fledderman, Director, Strategic Projects  
Diablo Canyon Power Plant  
Mail Code 104/6/602C  
Post Office Box 56  
Avila Beach, California 93424

### 1.3 PURPOSE AND OBJECTIVES

The purpose of the proposed survey is to conduct additional seismic studies in the vicinity of the Diablo Canyon Power Plant (DCPP) and known offshore fault zones near DCPP. These seismic studies will provide additional insights of any relationships or connection between the known faults as well as enhance knowledge of offshore faults near DCPP. The proposed deep (10 to 15 kilometers [km] or 6 and 9 miles [mi]), high energy seismic survey (HESS) (energy >2 kilo joules) would complement the shallow (< 1km/0.6 mi), low energy (< 2 kilo joules) 3D seismic reflection survey. The first and second phases of low energy 3D seismic surveys were conducted offshore DCPP by PG&E in November 2010 and January 2011, respectively. The third and last phase of the low energy 3D seismic surveys is being conducted in late summer 2012.

The objectives of the proposed high energy 3D seismic survey are to:

- Record high resolution wide 2D and 3D seismic reflection profiles of major geologic structures and fault zones in the vicinity of DCPP.
- Obtain improved deep (>1 km [>0.6 mi]) imaging of the Hosgri and Shoreline fault zones in the vicinity of the DCPP to constrain fault geometry. (Scheduled for 2013 survey activities)
- Obtain improved (>1km [>0.6 mi] depth) imaging of the intersection of the Hosgri and Shoreline fault zones near Point Buchon.
- Augment current regional seismic data base for subsequent use and analysis.



The Project is being undertaken due to public concerns with operating a nuclear power plant in a seismic active area of California after the Fukushima Daiichi emergency. PG&E will obtain as much seismic information as possible, while minimizing environmental impacts consistent with the permits required by federal, state, and local agencies to conduct the studies. The Project timeframe is limited to fall months (October 15 to December 31) due to whale and fish migration as well as nesting bird constraints. The survey will also be conducted over a period of two years to reduce the extent of annual exposure of marine resources to high seismic energy levels.

The current Project scope has been designed to minimize environmental impacts to the greatest extent feasible and has been modified to further recognize agency input and specific concerns regarding resident species of marine mammals within the survey area. PG&E is proposing to conduct the studies 24-hours per day, 7 days per week (24/7). This schedule is designed to reduce overall air emissions, length of time for operation in the water thereby reducing impacts to marine wildlife, commercial fishing, and other area users. PG&E will work with environmental agencies to appropriately address the balancing of public health and safety and environmental concerns during the conduct of these studies.

#### **1.4 PROJECT LOCATION**

The proposed Project would be conducted within the coastal (onshore and nearshore) and offshore marine waters between Morro Bay and San Luis Bay, offshore San Luis Obispo County, California (Figure 1-1). The proposed survey will cross all the major geologic units in the study area and image their structure at depth using high-resolution 2D and 3D seismic reflection profiling techniques. The offshore and onshore survey sound source transects, as well as the nearshore/onshore geophone locations, have been developed to address the project objectives as well as ongoing input from the California Public Utilities Commission's Independent Peer Review Panel (IPRP) and the survey contractor (Lamont-Doherty Earth Observatory – Columbia University).

#### **1.5 3D SEISMIC DATA ACQUISITION TARGET AREAS FOR 2012**

The proposed 3D seismic survey race tracks will encompass an area of approximately 740.52 km<sup>2</sup> (285.9 mi<sup>2</sup>). The race tracks within the Project area are divided into the two "primary target areas," (Boxes 2 and 4) which are described below and are shown on Figure 1-2. Box 3 was eliminated from the survey plan based on input from the IPRP process and associated CSLC permit approval. Box 1 has been scheduled for the 2013 work window and will be subject to a supplemental review process. The offshore (vessel) survey would be conducted in both federal and state waters and water depths within the proposed survey areas ranging from 0 to over 400 m (1,300 ft); the State three-mile limit is the teal line in Figure 1-1. The Point Buchon Marine Protected Area (MPA) lies within portions of the survey area. The Monterey Bay National Marine Sanctuary (MBNMS), a federally-protected marine sanctuary that extends northward from Cambria to Marin County, is located north and outside of the Project area.

**Survey Box 2. (Survey area from Estero Bay to offshore Santa Maria River Mouth)**

- Area: 406.04 km<sup>2</sup> (156.77 mi<sup>2</sup>)
- Total survey line length is 2,148.2 km (1,334.8 mi)
- Strike line surveys along the Hosgri fault zone and Shoreline, Hosgri and Los Osos fault intersections

**Survey Box 4. (Estero Bay)**

- Area: 334.48 km<sup>2</sup> (129.14 mi<sup>2</sup>)
- Total survey line length is 1,417.6 km (880.9 mi)
- Dip line survey across the Hosgri and Los Osos fault zones in Estero Bay

Figure 1-2 shows the proposed survey transit lines. These lines depict the survey lines as well as the turning legs. The full seismic array is firing during the straight portions of the track lines, as well as the initial portions of the run out sections and later portions of run in sections. During turns and most of the initial portion of the run ins, there will only be one air gun firing (mitigation air gun). Assuming a daily survey rate of approximately 8.3 km/hr (4.5 knots for 24/7 operations), Survey Box 2 approximately 14 days, and Survey Box 4 approximately 9.25 days. When considering mobilization, demobilization, equipment maintenance, weather, marine mammal activity, and other contingencies, the proposed survey is expected to be completed in 49.25 days. For an in-depth look into the project schedule, refer to Section 1.8 - Project Schedule.

**1.6 PROJECT ACTIVITIES**

The proposed survey involves both marine and some limited onshore activities. The offshore components consist of operating a geophysical survey vessel and support/monitoring vessels within the areas shown in Figure 1-2 and transiting between the two different survey box areas extending between the Santa Maria river mouth and Estero Bay, as shown in Figure 1-2. The geophysical survey vessel would tow a series of sound-generating air guns and sound-recording hydrophones along pre-determined shore-parallel and shore-perpendicular transects to conduct deep (10 to 15 km [6 to 9 mi]) seismic reflection profiling of major geologic structures and fault zones in the vicinity of DCP.

The nearshore actions include the placement of a small number of seafloor geophones (e.g. Fairfield Z700 nodal units) in nearshore water areas (to approximately 70 m (229.6 ft) isobath). Detailed descriptions of the proposed actions for each component are provided below.

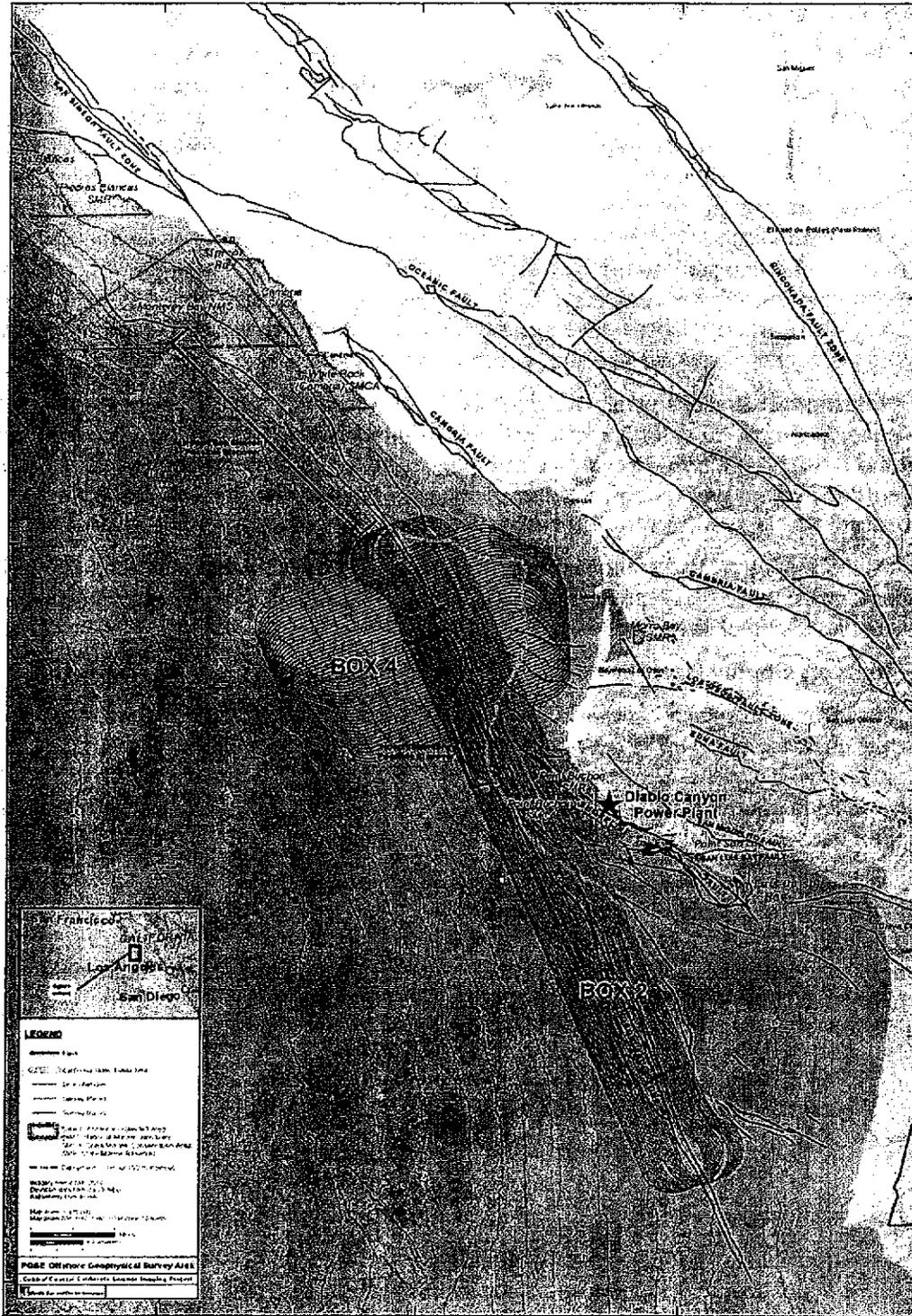


Figure 1-2. Proposed 2012 Project Survey Track Line Map



### 1.6.1 Mobilization and Demobilization

The offshore 3D marine survey equipment and vessels are highly specialized and typically not available in California. The proposed seismic survey vessel (*R/V Marcus G. Langseth [R/V Langseth]*) is currently operating on the west coast and is available to conduct the proposed survey work. The *R/V Langseth* would transit south prior to the start of survey operations (October 15 through December 31, 2012). Once the vessel has arrived in the Project area, the survey crew, any required equipment, and support provisions would be transferred to the vessel. The proposed survey vessel is supported by a chaseboat (*R/V Sea Trek or equivalent*) and scout/shore support boat (*M/V Dolphin II or equivalent*). Any additional scout/monitoring vessels required for the Project will be drawn from local vessel operators. Upon completion of the offshore survey operations, the survey crew would be transferred to shore and the survey vessel would transit out of the Project area.

Nearshore operations would be conducted using locally available vessels such as the *M/V Michael Uhl (M/V Uhl)*. Equipment, including the geophones and cables, would be loaded aboard the *M/V Uhl* in Morro Bay Harbor and transferred to the offshore deployment locations. Following deployment and recovery of the geophones and cables, they would be transferred back to Morro Bay Harbor for transport offsite.

Onshore receiver line equipment would be deployed by foot-based crews supported by four-wheel drive vehicles or small vessels. Once the Project has been completed, the equipment would demobilize from the area by truck.

### 1.6.2 Offshore Survey Operations

The proposed offshore seismic survey would be conducted with geophysical vessels specifically designed and built to conduct such surveys. PG&E has selected the *R/V Langseth*, which is operated by the Lamont-Doherty Earth Observatory (Columbia University). The following outlines the general specifications for the *R/V Langseth* geophysical survey vessel and the support vessels needed to complete the offshore survey.

In water depths from 25 to 305 m (82 to >1,000 ft), the *R/V Langseth* will tow four hydrophone streamers with a length of approximately 6 km (3.7 mi). The intended tow depth is approximately 10 m (32.8 ft). Flotation is provided on each streamer, as well as Streamer Recovery Devices (SRD). The SRD are activated when the streamer sinks to a pre-determined depth (e.g. 50 m [164 ft]) to aid in recovery.

- Primary vessel – *R/V Langseth* is 71.5 m [235 ft] in length and is outfitted to deploy/retrieve hydrophone streamers and air gun arrays, air compressors for the air gun array, and survey recording facilities.
- Chase boat – *R/V Sea Trek* is 38.7 m (127 ft) in length and will be deployed in front of the *R/V Langseth* to observe potential obstructions, additional marine mammal monitoring and support deployment of seismic equipment.
- Third vessel – *M/V Dolphin II* is approximately 20 m [65 ft] in length and would act as a scout boat and support vessel for the *R/V Langseth*.
- Nearshore work vessel (approximately 50 m [150 ft] in length and would be used to deploy/retrieve seafloor geophones in the shallow water (0-20m) zone (e.g. *M Uhl*).

- **Monitoring Aircraft** – Partenavia P68-OBS "Observer", a high-wing, twin-engine plane or equivalent. The aircraft would be used to perform aerial surveys of marine mammals.

**Survey Vessel Specifications.** The *RV Langseth* would tow the air gun and hydrophone streamers array along predetermined lines (Figure 1-2). When the *RV Langseth* is towing the air gun and streamer array the vessel will "fly" the appropriate USCG-approved day shapes (mast head signals used to communicate with other vessels) and display the appropriate lighting to designate the vessel has limited maneuverability. The turning radius is limited to 3 degrees per minute (2.5 km [1.5 mi]). Thus, the maneuverability of the vessel is limited during operations with the streamers.

The *RV Langseth* has a length of 71.5 m (235 ft), a beam of 17.0 m (56 ft), and a maximum draft of 5.9 m (19.4 ft). The *RV Langseth* was designed as a seismic research vessel, with a propulsion system designed to be as quiet as possible to avoid interference with the seismic signals. The ship is powered by two Bergen BRG-6 diesel engines, each producing 3,550 hp, which drive the two propellers directly. Each propeller has four blades, and the shaft typically rotates at 750 revolutions per minute (rpm). The vessel also has an 800 hp bowthruster, which is not used during seismic acquisition. The operation speed during seismic data acquisition is typically 7.4 to 9.3 km/h (4.6 to 5.7 miles/h). When not towing seismic survey gear, the *RV Langseth* typically cruises at 18.5 km/h (11.5 miles/h).

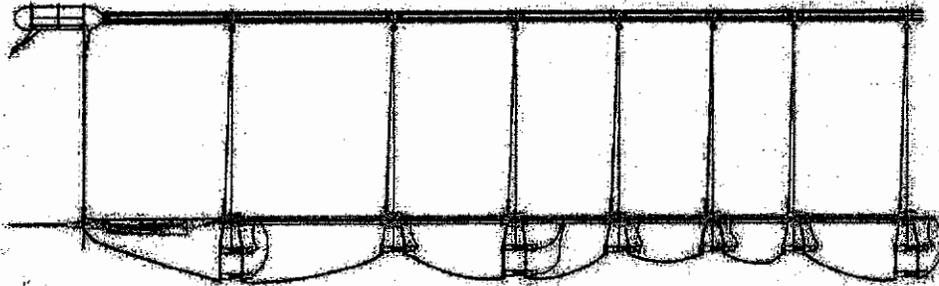
Other details of the *RV Langseth* include the following:

- **Owner:** National Science Foundation
- **Operator:** Lamont-Doherty Earth Observatory of Columbia University
- **Flag:** United States of America
- **Date Built:** 1991 (Refitted in 2006)
- **Gross Tonnage:** 3834
- **Accommodation Capacity:** 55 including ~35 scientists

**Air Gun Description.** The survey will be shot using two tuned air-gun arrays, consisting of two sub-arrays with 1,650 cubic inches (in<sup>3</sup>). The array would consist of a mixture of Bolt 1500LL and Bolt 1900LLX air guns. The subarrays would be configured as two identical linear arrays or "strings" (Figure 1-3). Each string would have ten air guns; the first and last air guns in the strings are spaced 16 m apart. Nine air guns in each string would be fired simultaneously (for a total volume of approximately 3,300 in<sup>3</sup>), whereas the tenth is kept in reserve as a spare, to be turned on in case of failure of another air gun. The subarrays would be fired alternately during the survey. Each of the two subarrays would be towed approximately 140 m (459 ft) behind the vessel and would be distributed across an area of approximately 12 by 16 m (40 by 50 ft) behind the primary vessel, offset by 75 m (250 ft). Discharge intervals depend on both the ship's speed and Two Way Travel Time (TWTT) recording intervals. For a 16-second TWTT, air guns will be discharged approximately every 37.5 meters (123 ft) based on an assumed boat speed of 4.5 knots. The firing pressure of the subarrays is 1,900 pounds per square inch (psi).

During firing, a brief (~0.1 s) pulse of sound is emitted. The air guns would be silent during the intervening periods.

The tow depth of the air gun array would be 9 m (29.5 ft). Because the actual source is a distributed sound source (9 air guns) rather than a single point source, the highest sound levels measurable at any location in the water would be less than the nominal single point source level. In addition, the effective (perceived) source level for sound propagating in near-horizontal directions would be substantially lower than the nominal omni-directional source level because of the directional nature of the sound from the air gun array (i.e. sound is directed downward).



**Figure 1-3. One Linear Air Gun Array or String with Ten Air Guns,  
Nine of Which Would Be Operating.**

Details regarding the proposed 18-air gun array (2 Strings) specifications are as follows:

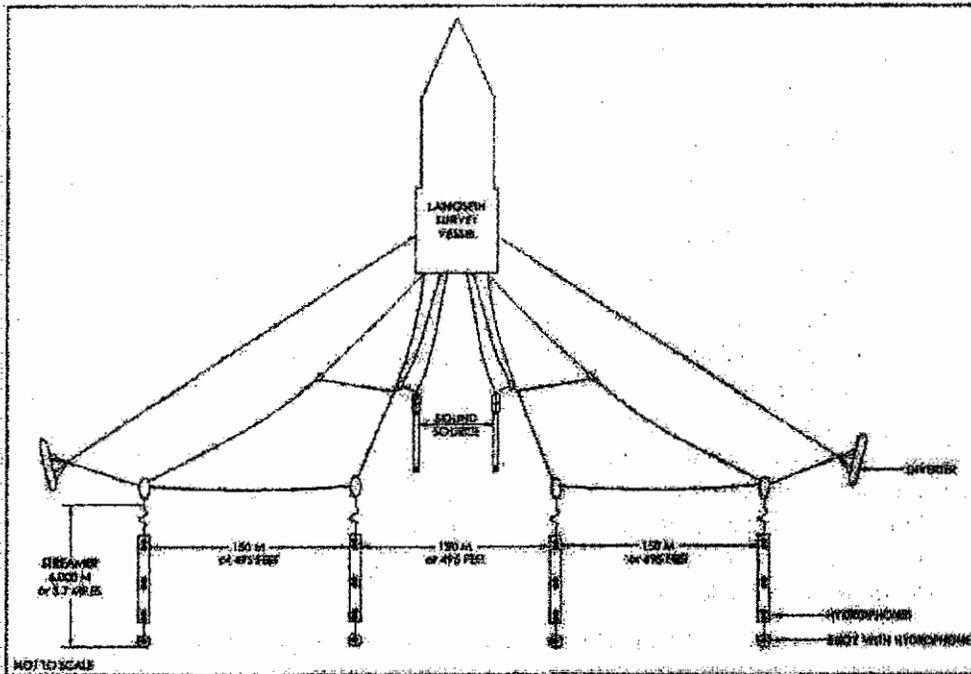
- Energy Source: Eighteen 2,000 psi Bolt air guns of 40-360 in<sup>3</sup>
- Source output (downward): 0-pk is 42 bar-m (252 dB re 1  $\mu$ Pa · m); pk-pk is 87 bar-m (259 dB)
- Towing depth of energy source: 9 m (29.5 ft)
- Air discharge volume: ~3,300 in<sup>3</sup>
- Dominant frequency components: 0-188 Hertz (Hz)

Compass Birds would be used to keep the air guns at a depth of 9 m (29.5 ft) and the vessel speed during data collection would range from 7.4 to 9.3 km/h (4 to 5 nautical miles per hour [knots]). The sound source would be generated by the discharge of the air guns approximately every 37.5 m (123 ft) which is based on an assumed vessel speed of 8.3 km/h (4.5 knots). The expected timing of the shots is once every 15 to 20 seconds.

**Hydrophone Streamer Description.** The survey will be recorded using a system array of four hydrophone streamers, which would be towed behind the *R/V Langseth*. Each streamer would consist of Sentry Solid Streamer Sercel cable approximately 6,000 m (3.7 miles) long. The streamers are attached by floats to a diverter cable, which keeps the streamer spacing at approximately 100 to 150 m (328 to 492 ft) apart

A series of seven hydrophones is present along each streamer for acoustic measurement. The hydrophones would consist of a mixture of Sonardyne Transceivers. Each

streamer will contain three groups of paired hydrophones, with each group approximately 2,375 m (7,800 ft) apart. The hydrophones within each group would be approximately 300 m (984 ft) apart. One additional hydrophone will be located on the tail buoy attached to the streamer cable. In addition, one Sonardyne Transducer would be attached to the air gun array. Compass Birds would be used to keep the streamer cables and hydrophones at a depth of approximately 10 m (33 ft). One Compass Bird would be placed at the front end of each streamer. The Figure 1-4 depicts the configuration of both the streamer and air gun array used by the *R/V Langseth*.



**Figure 1-4. *R/V Langseth* Air Gun and Streamer Deployment**

Details regarding the proposed hydrophone streamer and acoustic recording equipment specifications are provided in Table 1-1.

**Table 1-1. Summary of Offshore Streamer Features**

<b>Hydrophone Type</b>	<b>Sonardyne XSRS Transceiver 7885 (Standard)</b>
Length of Individual Unit (approximate)	85.8 centimeters (33.8 inches)
Diameter of Individual Unit (approximate)	7.5 centimeters (3.0 inches)
Weight of Individual Unit in Air (approximate)	7.3 kilograms (16.0 pounds)
Number of Units per String	5
<b>Hydrophone Type</b>	<b>Sonardyne XSRS Transceiver 8005 (Long Life)</b>
Length of Individual Unit (approximate)	91.1 centimeters (35.9 inches)
Diameter of Individual Unit (approximate)	8.9 centimeters (3.5 inches)
Weight of Individual Unit in Air (approximate)	10.4 kilograms (22.9 pounds)
Number of Units per String	2
<b>Hydrophone Type</b>	<b>Sonardyne HGPS Transducer 7887 (Right Angle)</b>
Length of Individual Unit (approximate)	56.3 centimeters (22.2 inches)

Diameter of Individual Unit (approximate)	9.4 centimeters (3.7 inches)
Weight of Individual Unit in Air (approximate)	9.6 kilograms (21.2 pounds)
<b>Depth Sensor</b>	<b>ION Model 5011 Compass Bird</b>
Length of Individual Unit (approximate)	120 centimeters (48.2 inches)
Weight of Individual Unit in Air (approximate)	8.32 kilograms (18.3 pounds)
Number of Units per Streamer (approximate)	4
Number of Units per String	1
<b>Streamer Type</b>	<b>Thompson Marconi Sentry</b>
Streamer Depth (approximate)	10 meters (33 feet)
Group Interval (approximate)	12.5 meters (41 feet)
Group Length (approximate)	12.5 meters (41 feet)
Number of Groups	468
Length of Streamer	6 kilometers (3.7 miles)
Source: Columbia University	

**Acoustic Measurements.** The strength of the air gun pulses can be measured in a variety of ways, but National Marine Fisheries Service (NMFS) commonly uses "root mean square" (in dB re 1 $\mu$ Pa [rms]), which is the level of the received air gun pulses averaged over the duration of the pulse. The rms value for a given air gun pulse is typically 10 dB lower than the peak level, and 16 dB lower than the peak-to-peak level (McCauley *et al.*, 1998, 2000).

The noise modeling for the proposed 3D seismic survey was conducted based on the results of mathematical modeling conducted by Greeneridge Sciences, Inc. (2011). The model results are based upon the air gun specifications provided for *R/V Langseth* and seafloor characteristic available for the Project area. Safety and Exclusion zone dimensions are based on NMFS definitions for Incidental Harassment Authorizations (IHA). The Safety Zone is the distance within which received sound levels are modeled to be greater than 160 db and the Exclusion Zone is the distance within which received sound levels are modeled to be greater than 180 db. Distances to received levels of 120, 154, 160, 170, 180, 187, and 190 dB re 1 $\mu$ Pa (rms) are also detailed in Table 1-2.

**Table 1-2. Calculated Radii for Upslope, Downslope and Alongshore Propagation Paths**

Sound Pressure Level (SPL) (dB re 1 $\mu$ Pa)	Upslope Distance (In Shore)			Downslope Distance (Offshore)			Alongshore Distance		
	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>
190	250	0.16	0.13	280	0.17	0.15	320	0.20	0.17
187	390	0.24	0.21	370	0.23	0.20	410	0.25	0.22
180	1,010	0.63	0.55	700	0.43	0.38	750	0.47	0.40
170	2,990	1.86	1.61	1,760	1.09	0.95	1,760	1.09	0.95
160	6,210	3.86	3.35	4,450	2.77	2.40	4,100	2.55	2.21
154	8,570	5.33	4.63	7,820	4.86	4.22	6,780	4.21	3.66
120	24,650	15.32	13.31	251,320	156.16	135.70	94,870	58.95	51.23

M<sup>1</sup> = Meters; SM<sup>2</sup> = Statute miles; NM<sup>3</sup> = Nautical Miles

**Multibeam Echosounder and Sub-bottom Profiler.** Along with the air gun operations, two additional acoustical data acquisition systems will be operated from the *R/V Langseth* continuously during the survey. The ocean floor will be mapped with a Kongsberg EM-122 multibeam echosounder (MBES) and a Knudsen 320B sub-bottom profiler (SBP).

The Kongsberg EM-122 MBES operates at 10.5–13 (usually 12) kHz and is hull-mounted on the *R/V Langseth*. The transmitting beam width is 1 or 2-degree fore-aft and 150-

degree athwartship. The maximum source level is 242 dB re 1  $\mu$ Pa (rms). Each "ping" consists of eight (in water >1,000 m/3,300 ft deep) or four (<1000 m/3,300 ft) successive fan-shaped transmissions, each ensonifying a sector that extends 1 degree fore-aft. Continuous-wave (CW) pulses increase from 2 to 15 ms long in water depths up to 2,600 m (8,350 ft), and frequency-modulated (FM) chirp pulses up to 100 ms long are used in water >2,600 m (8,350 ft). The successive transmissions span an overall cross-track angular extent of about 150 degree, with 2 ms gaps between the pulses for successive sectors. (See Table 1-3)

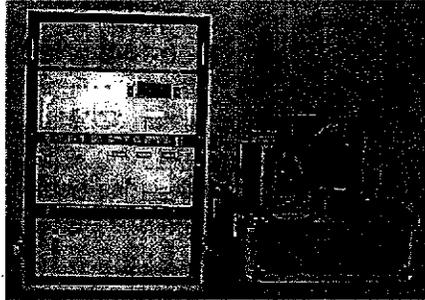
The Knudsen 320B SBP is normally operated to provide information about the sedimentary features and the bottom topography that is being mapped simultaneously by the MBES. The beam is transmitted as a 27-degree cone, which is directed downward by a 3.5-kHz transducer in the hull of the *R/V Langseth*. The maximum output is 1,000 watts (204 dB), but in practice, the output varies with water depth. The pulse interval is 1 sec, but a common mode of operation is to broadcast five pulses at 1-sec intervals followed by a 5-sec pause.

Both the Kongsberg EM-122 MBES and Knudsen 320B SBP are operated continuously during survey operations. Given relatively shallow water depths of the survey area (20 – 300 m), the number of 'pings' or transmissions would be reduced from 8 to 4, and the pulse durations would be reduced from 100 ms to 2-15 ms for the Kongsberg EM-122. Power levels of both instruments would be reduced from maximum levels to account for water depth. Actual operating parameters will be established at the time of the survey. Additional details are provided in Table 1-3.

**Table 1-3. *R/V Langseth* Sub-bottom Profiler Specifications**

Maximum source output (downward)	204 dB re 1 $\mu$ Pa·m; 800 watts
Dominant frequency components	3.5 kHz
Bandwidth	1.0 kHz with pulse duration 4 ms 0.5 kHz with pulse duration 2 ms 0.25 kHz with pulse duration 1 ms
Nominal beam width	30 degrees
Pulse duration	1, 2, or 4 ms

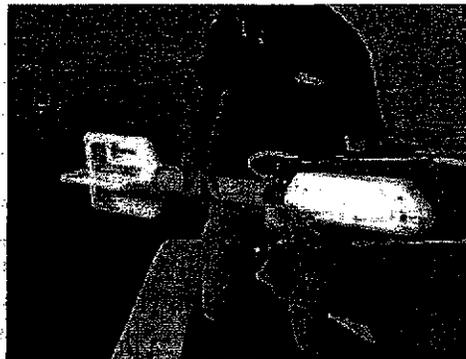
**Gravimeter (BGM-3).** The *R/V Langseth* will employ a Bell Aerospace BGM-3 gravimeter system (Figure 1-5) to measure very tiny fractional changes within the Earth's gravity caused by nearby geologic structures, the shape of the Earth, and by temporal tidal variations. The BGM-3 has been specifically designed to make precision measurements in a high motion environment. Precision gravity measurements are attained by the use of the highly accurate Bell Aerospace Model XI inertial grade accelerometer.



**Figure 1-5. Bell BMG Marine Gravity Meter**

**Magnetometer (G-882).** The *R/V Langseth* will employ a Bell Aerospace BGM-3 geometer which contains a Model G-882 cesium-vapor marine magnetometer (Figure 1-6). Magnetometers measure the strength and/or direction of a magnetic field, generally in units of nanotesla (nT) in order to detect and map geologic formations. These data would enhance earlier marine magnetic mapping conducted by the USGS (Sliter et al., 2009).

The G-882 is designed for operation from small vessels for shallow water surveys, as well as for the large survey vessels for deep tow applications (4,000 psi rating, telemetry over steel coax available to 10 km). Power may be supplied from a 24 to 30 VDC battery power or a 110/220 VAC power supply. The standard G-882 tow cable includes a Vectran strength member and can be built to up to 700 m (2,297 ft) (no telemetry required). The shipboard end of the tow cable is attached to a junction box or on-board cable. Output data is recorded on a computer with an RS-232 serial port.



**Figure 1-6. Geometrics G-882 Magnetometer**

### **1.6.3 Nearshore and Onshore Survey Operations**

To collect deep seismic data in water depths that are not accessible by the *R/V Langseth* (less than 25 m [82 ft]), seafloor geophones will be used. The currently proposed locations for the seafloor geophone lines surrounding DCCP are shown in Figure 1-7.

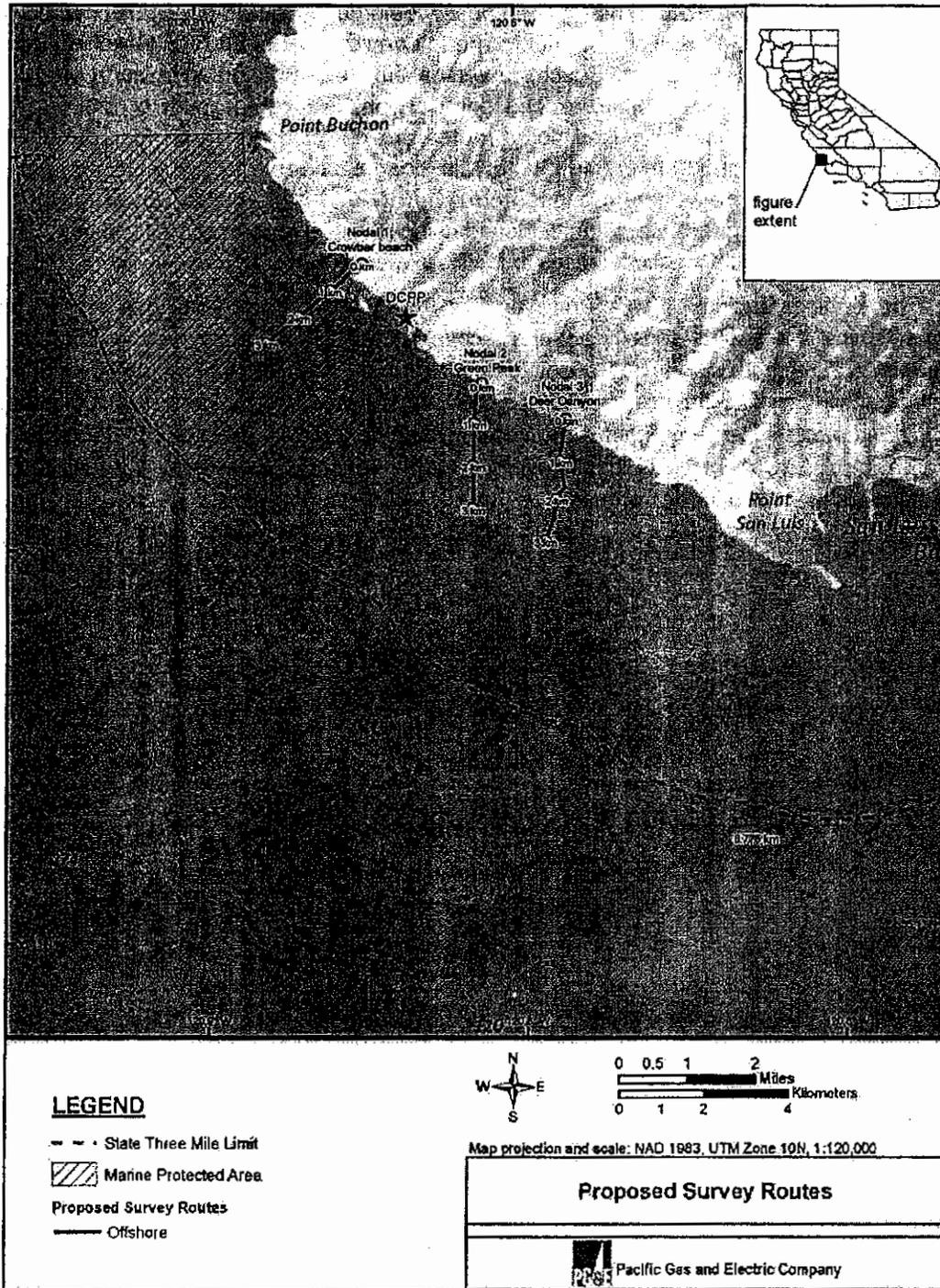


Figure 1-7. Proposed Marine Geophone Lines near Diablo Canyon Power Plant

One dozen (12) Fairfield Z700 marine nodes would be placed on the seafloor along two nearshore survey routes as a pilot test prior to the full deployment of 600 nodes scheduled for 2013. The northern route (Crowbar Beach) traverses the Point Buchon MPA north of DCP. The southern route (either Green Peak or Deer Canyon) is located south of DCP. The approximate locations of the proposed nodal routes are depicted above on Figure 1-7. Six nodes would be placed at 500 m (1,640 ft) intervals along each route for a total length of 3 km (1.8 miles). Maximum water depth ranges from 70 m (229.6 ft) (Crowbar) to 30 m (98.4 ft) (Deer Canyon). Marine nodes would be deployed using a vessel and (in some locations) divers and will be equipped with acoustic releases to facilitate recovery.

The seafloor equipment will be in place for the duration of the 2012 offshore 3D high energy seismic surveys plus deployment and recovery time. Node deployment will be closely coordinated with offshore survey operations to ensure survey activities are completed before the projected battery life of 45 days is exceeded. PG&E anticipates using a locally available vessel to deploy and retrieve the geophones. The vessel would be a maximum of 150 feet (50 meters) in length. The *M/V Uhl*, which is locally available, or a vessel of equivalent size and engine specification, is proposed for this purpose.

Figure 1-8 shows an example of a Fairfield Z700 nodal unit and Table 1-4 summarizes its features.



**Figure 1- 8. Fairfield Z700 Seafloor Geophone**

**Table 1- 4. Summary of Nearshore Geophone Features**

<u>Feature</u>	<u>Description</u>
Geophone Model	Fairfield Z700
Height of Individual Unit	15 cm (6 in)
Diameter of Individual Unit	38 cm (15 in)
Weight of Individual Unit	29 kg (65 lbs) when wet
Number of Units per String	Crowbar Beach: 6 Green Peak: 6 or Deer Canyon: 6
Length of Overall Receiver String (approximate)	Crowbar Beach: 3 km (1.9 mi) Green Peak: 3 km (1.9 mi) or Deer Canyon: 3 km (1.9 mi)

Onshore, a linear array of Zland nodals will be deployed along a single route on the Morro Strand to record onshore sound transmitted from the offshore air gun surveys. Route location is shown in Figure 1-10. Ninety nodes would be placed at 100 m (328 ft.) intervals along the Strand for a total route length of ~ 9 km (5.6 mi). The autonomous, nodal, cable-less

recording systems (Figure 1-9) would be deployed by foot into the soil adjacent to existing roads, trails and beaches. The nodal systems are carried in backpacks and pressed into the ground at each receiver point. Each nodal would be removed following completion of the data collection. PG&E estimates that the onshore receiver activities would be conducted over a 2 to 3-day period, concurrent with the offshore surveys.



\* Includes a 5 inch spike, is 6 inches high, 5 inches in diameter, and weighs 5 lbs.

**Figure 1-9. Example of Autonomous Wireless Nodal Land Recording System\***

**Deployment Operations.** PG&E estimates that the onshore receiver activities would be conducted over a 2 to 3-day period, concurrent with the offshore surveys.

## **1.7 PROJECT PERSONNEL AND EQUIPMENT**

### **1.7.1 Equipment Requirements**

The following vessels and equipment are being evaluated for use in the proposed offshore survey.

- *R/V Marcus G. Langseth*
  - Four hydrophone streamers;
  - Two air gun arrays;
  - Multi Beam Echo Sounder and Sub Bottom Profiler; gravity and magnetic sensors.
- Chase boat – *R/V Sea Trek* or equivalent
- Support vessel – *M/V Dolphin II* or equivalent
- *M/V Michael Uhl*
- Monitoring aircraft – Partenavia P68-OBS "Observer" (or equivalent aircraft)
- Marine geophones (approximately 12 geophones with acoustic releases)
- Canoe/kayak

The following is a preliminary estimate of anticipated vehicle and equipment needs for the proposed seismic surveys.

- 1 to 2 vans for data recording/processing.

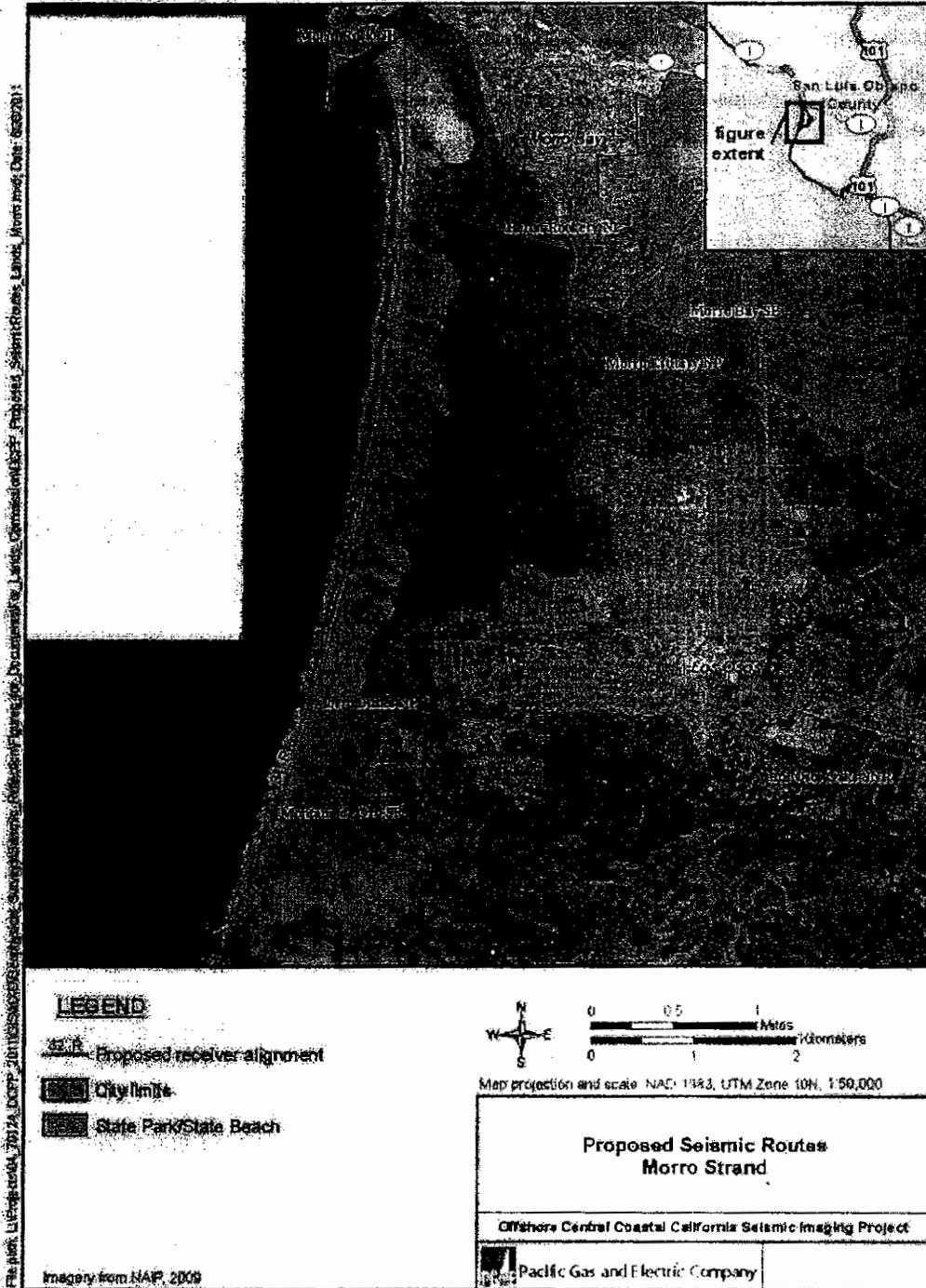


Figure 1-10. Proposed Onshore Seismic Lines, Central Area

### 1.7.2 Personnel Requirements

It is estimated that 89 personnel would be required for the proposed offshore survey program. Additional project-related personnel may also participate. The 89 personnel breakdown is as follows:

- *RV Marcus G. Langseth* crew: 55 (Based on Coast Guard registration)
- *RV Sea Trek* 12
- *M/V Dolphin II* 6
- *M/V Michael Uhl* crew: 5
- Support divers: 3
- Partenavia P68-OBS "Observer" 5
- Administrative/computer support: 3

Onshore survey operations are expected to require approximately 6 crew members. In addition, biological and cultural resource monitors would accompany each team in sensitive resource areas. These teams would operate at intervals of 0.8 to 4.8 km (0.5 to 3 mi) throughout the proposed Project area.

### 1.8 2012 PROJECT SCHEDULE

The proposed activities, including mobilization and demobilization, are expected to take 49.25 operational days to complete, assuming 24/7 operations. This estimate includes time for instrument deployment, profiling, instrument recovery, and demobilization. Mobilization will be initiated on October 15, with active air gun surveys taking place from November 1 through December 31, 2012.

Below is an estimated schedule for the Project using the *RV Langseth* as the primary survey vessel.

- Mobilization to Project Site - 6 days
- Initial Equipment Deployment - 3 days (offshore geophone deployment also)
- Pre-activity marine mammal surveys - 5 days (concurrent to equipment mobilization and deployment)
- Onshore geophone deployment - 2 - 3 days (concurrent with offshore deployment activities)
- Equipment Calibration and Sound Check - 5 days
- Seismic Survey - 23.25 days (Per the direction of the NMFS Box 4 will be surveyed first followed by Box 2)
  - Survey Box 4 (Survey area within Estero Bay) - 9.25 days
  - Survey Box 2 (Survey area from Estero Bay to offshore Santa Maria River Mouth) - 14 days
- Streamer and air gun preventative maintenance - 2 days
- Additional shutdowns (marine mammal presence, crew changes, and unanticipated weather delays) - 4 days
- Demobilization - 6 days

TOTAL: 49.25 days (for 24/7 operation). Note that the total of 49.25 days is based on adding the above non-concurrent tasks.

Placement of the onshore receiver lines would be completed prior to the start of offshore survey activities and would remain in place until the offshore activities can be completed.

## **1.9 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING**

During marine survey operations, key concerns would be the potential impacts to marine wildlife due to exposure to high sound levels associated with the use of the air guns, from direct collisions with the survey vessels, or from placement of geophones or cables directly on sensitive habitat or species. The proposed marine seismic survey activities have the potential to disturb or displace small numbers of marine mammals. These potential effects will not exceed what is defined in the 1994 amendments to the Marine Mammal Protection Act (MMPA) as "Level B" harassment (behavioral disturbance). The mitigation measures to be implemented during this survey are based on Level B harassment criteria using the sound level of 160 dB re 1  $\mu$ Pa (rms), and will, as such, minimize any potential risk of injury, such as damage to the auditory organs. No take by injury or death is likely given the nature of the activities and proposed monitoring and mitigation measures.

In addition, PG&E would implement a Marine Wildlife Contingency Plan (MWCP) which includes measures designed to reduce the potential impacts on marine wildlife, particularly marine mammals, from the proposed operations. This program would be implemented in compliance with measures developed in consultation with NMFS/FWS and would be based on anticipated exclusion and safety zones derived from modeling of the selected energy source levels. These exclusion and safety zones would be reviewed in context with Incidental Harassment Authorization (IHA) to be conducted by NMFS/FWS as part of the Project review under the Federal Endangered Species Act and MMPA.

### **1.9.1 High Energy Seismic Survey Impact Reduction Measures**

PG&E is utilizing acoustic models to predict sound levels associated with the air gun array, and this information was used to establish a safety zone and exclusion zone for marine mammals and turtles equating to the distances to the 160 to 180 dB re 1  $\mu$ Pa, respectively. The MWCP (see Appendix E) that PG&E plans to implement includes these zones to ensure protection of potential effected species. Measures that are also included in the plan are:

- PG&E conduct an aerial survey approximately 1 week prior to seismic survey to obtain pre-survey information on the numbers and distribution of marine mammals in the seismic survey area. Additionally weekly aerial surveys will be conducted during active air gun survey operations.
- NMFS-certified protected species observers (PSO) would be stationed on primary survey vessel, on the scout vessel, and on the aircraft (if necessary).
- A scout vessel would be deployed with PSO's to monitor marine wildlife within the survey exclusion and safety zone.
- If marine mammals or other sensitive wildlife are observed within or around the exclusion zone, avoidance measures will be taken including decreasing speed of vessel and a power down or shut down if necessary.

- Use of power up, ramp up, and shutdown procedures would be observed for air gun operations.
- Mitigation air gun would be used during survey turns outside of the 3D survey area as well as during shut down or standby periods.
- Passive Acoustic Monitoring (PAM) will be available to supplement visual monitoring in conditions of poor visibility or low lighting where it doesn't interfere with survey operations.
- If nighttime survey operations are located within the 40 m (131 ft) depth contour, PSO's will visually monitor the area forward the vessel with the aid of infrared goggles/binoculars and the forward looking infrared system available on the R/V Langseth. Mitigation measures, such as avoidance, power down, and/or shut down, would be implemented, if a sea otter is observed within the vessels' path.

In addition, the proposed survey timing (October 15 through December 31) has been developed in consideration of the generally lower presences of migrating and summer season whales in the Project area. PG&E proposes that the surveys are conducted on a 24/7 schedule to reduce overall length of operations thereby lessening impacts to commercial and recreational fisheries.

#### **1.9.2 Nearshore Geophone Deployment Impact Reduction Measures**

A team of diver-biologists have completed an initial survey of a 3 m (10 ft) wide corridor centered on the proposed geophone alignments and to determine the presence of any black abalone (*Haliotis cracherodii*). This survey did not identify any black abalone within the proposed corridor at this time. However, no more than two days prior to the placement of the geophone lines within the rocky inter- and shallow subtidal zone, a team of diver-biologists would resurvey these alignments to ensure no black abalone have moved into the corridors.

Deployment of geophone lines within rocky substrate in water depths of 3 m (10 ft) or less would be completed by divers who would pull the line from a boat and place each geophone to avoid any previously marked or observed black abalone. If a black abalone that had not been previously recorded is observed by the diver during geophone line deployment, the line would be placed at least 3 m (10 ft) away from that location. The location of all black abalone observed during the geophone line deployment would be recorded and included in a post-lay report.

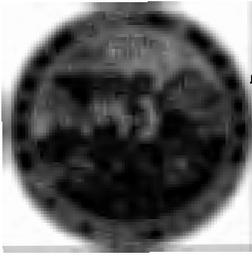
#### **1.9.3 Onshore Geophysical Survey Impact Reduction Measures**

PG&E proposes the following measures to reduce impacts on sensitive wildlife during the onshore survey operations. A Worker Environmental Awareness Training Program (WEAP) would be prepared and presented to all personnel at the beginning of the project. This program was designed to discuss sensitive species and habitats, and why it is important to avoid disturbing them during project activities. A qualified biologist would perform pre-activity surveys along with daily monitoring to document sensitive species and compliance with avoidance measures. Seismic surveys would be designed to avoid California Department of Fish and Game (CDFG) sensitive species and the following federally listed species:

- Morro Bay kangaroo rat



- Morro shoulderband snail
- Western snowy plover
- California least tern
- California clapper rail



SAN LUIS OBISPO COUNTY

## DEPARTMENT OF PLANNING AND BUILDING

Promoting the wise use of land – Helping to build great communities

May 20, 2011

Mr. Loren Sharp  
Senior Director, Technical Services  
Diablo Canyon Power Plant  
Mail Code 104/6/603  
PO Box 56  
Avila Beach, California 93424

RE: Onshore Central Coastal California Seismic Imaging Project, San Luis Obispo County

Dear Mr. Sharp,

This letter will confirm that the County has reviewed the project description that you submitted to conduct an onshore deep seismic data collection survey for the purpose of assessing the potential impact of various fault zones surrounding the Diablo Canyon Power Plant.

The survey will be accomplished by using specialized technical vehicles that will drive along existing private or county roads. No new roads will be created for this purpose. Equipment from the trucks will be operated in 5-minute increments at each location to generate ground vibrations that create seismic (sound) waves which will be recorded by either a cable-based geophone recording system along roads or a cableless, portable nodal recording system in more remote areas. We understand that these portable nodal recording units are about the size of a coffee can and are pressed into the ground to record the data. Both the cabled and nodal systems will be removed following the conclusion of survey activities. No permanent facilities are needed.

The project is proposed to be temporary in nature, with no long-term, operational changes in land use. As mentioned already, the operations will be located along existing public and private access roadways. Biological and archaeological monitors will accompany each survey team so that any sensitive resource areas will be avoided. The project will comply with, or is exempt from, County vibration and noise standards and will operate between 7 am and 9 pm.

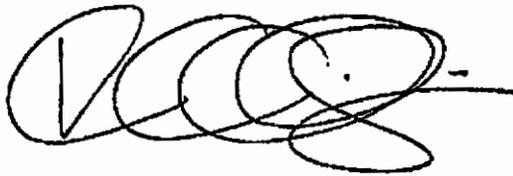
After detailed review of the project description submitted by Padre Associates, Inc. (Project No. 1002-2122, dated May 2011), the County has determined that the survey work to gather seismic data does not meet the definition of "Development" per Section 23.03.040 of the Coastal Zone Land Use Ordinance, and therefore, will not require a coastal development permit.

Mr. Loren Sharp  
May 20, 2011  
Page 2

As we have discussed previously, we understand that the offshore component of the seismic imaging project is still being developed. We continue to note that any work that is required on the beach may require a coastal development permit, and work offshore may need permits from other agencies.

If the onshore portion of the project changes in any manner from the project description that you provided, we would need to re-evaluate possible requirements for county permits. Please contact either Nancy Orton at 805/781-5008 or Ellen Carroll at 805/781-5028 should that occur.

Sincerely,

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

Kami Griffin, Assistant Director  
Department of Planning and Building

**E-12-005 / CC-027-12  
Pacific Gas & Electric Co.**

**CORRESPONDENCE**

- **Ex-Parte Communications**
- **Applicant: Pacific Gas & Electric Co.**
- **Federal / State Agencies**
- **Local Government / Tribal**
- **Private Organizations**
- **E-mails to CCC Staff, Cassidy Teufel**
- **Opposition Letters from Interested  
Individuals**

**E-12-005**  
**PG&E SEISMIC SURVEY**

**EX-PARTE COMMUNICATIONS**



FORM FOR DISCLOSURE  
OF EX PARTE  
COMMUNICATIONS

RECEIVED

NOV 02 2012

Name of description of project, LCP, etc.:

PG&E Seismic Survey

Date of receipt of communication:

10/5/12 10:45 AM

Location of communication:

Sacramento, Ca

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

meeting

Person(s) initiating communication:

Mark Krause, PG&E

Person(s) receiving communication:

Mary Shallenburger

Detailed substantive description of content of communication:  
(Attach a copy of the complete text of any written material received.)

Mark gave me a brief legislative history of the bill that resulted in this project. He explained that the CPUC created the Independent Peer Review panel (IPRP) to give technical input on the project. He explained that Supervisor Bruce Gibson believes that PG&E should be using a 10 streamer array, instead of what's proposed. He said that no one on the IPRP really has expertise on this technology. He said that the size of the project is being reduced to include only the Survey Box 4 which has the shortest duration of the different segments of the full project. They are doing weekly aerial surveys. He said that some ask if they really need to use high energy 3D. He laid out the time constraints for PG&E to get the surveys completed in time for the re-issuing of Diablo's license by FERC.

10/15/12  
Date

Mary K. Shallenburger  
Signature of Commissioner

If the communication was provided at the same time to staff as it was provided to a Commissioner, the communication is not ex parte and this form does not need to be filled out.

If communication occurred seven or more days in advance of the Commission hearing on the item that was the subject of the communication, complete this form and transmit it to the Executive Director within seven days of the communication. If it is reasonable to believe that the completed form will not arrive by U.S. mail at the Commission's main office prior to the commencement of the meeting, other means of delivery should be used, such as facsimile, overnight mail, or personal delivery by the Commissioner to the Executive Director at the meeting prior to the time that the hearing on the matter commences.

If communication occurred within seven days of the hearing, complete this form, provide the information orally on the record of the proceeding and provide the Executive Director with a copy of any written material that was part of the communication.

FORM FOR DISCLOSURE  
OF EX PARTE  
COMMUNICATIONS

Date and time of communication: Oct 4, 2012

Location of communication: my office  
(If communication was sent by mail or facsimile, indicate the means of transmission.)

Identity of person(s) initiating communication: David Neish, DB Neish

Identity of person(s) receiving communication: Mark Krause PG & E

Name or description of project: Bocheo  
Diable Canyon - Seismic Project

Description of content of communication:  
(If communication included written material, attach a copy of the complete text of the written material.)

see attached

10/4/12  
Date

[Signature]  
Signature of Commissioner

If communication occurred seven (7) or more days in advance of the Commission hearing on the item that was the subject of the communication, complete this form and transmit it to the Executive Director **within** seven (7) days of the communication. If it is reasonable to believe that the completed form will not arrive by U.S. mail at the Commission's main office prior to the commencement of the meeting, other means of delivery should be used, such as facsimile, overnight mail, or personal delivery by the Commissioner to the Executive Director at the meeting prior to the time that the hearing on the matter commences.

If communication occurred within seven (7) days of the hearing, **complete** this form, provide the information **orally** on the record of the proceeding **and** provide the Executive Director with a copy of any written material that was part of the communication.

Applicants started by outlining the history of the project, AB 1632 and a subsequent bill that went through the Legislature but was vetoed by the governor that would have mandated high intensity 3D testing. PG&E had been against this testing, thinking that their existing technology and tests were sufficient.

Diablo has been built to withstand .75G earthquake and all the testing shows it can more than meet this standard. The prior technology was like "xray" vs the new which is "MRI" and they have come to believe that they should do the most current testing to insure their prior findings are good.

Prior to our meeting they had heard from NMFS that they were not going to be allowed to do Box 2 and Box 4 in the same year. Then heard from Commission staff that County Supervisor Bruce Gibson had proposed a different technology (10 streamers) but hadn't gotten enough analysis of that method. So PG&E withdrew Oct. application and postponed until November.

Also, this allows them to use Box 4 as a "test" of the method: Box 4 is not near the MLPA and will last only 9 days. If no severe "harassment" occurs and the data is valuable, then will do Box 2.

I asked several questions: What can the high intensity 3D tests show prove that you don't already know? They know the Hosgri fault is no more than .75g, but high intensity 3D will confirm that. They are pretty sure the Shoreline fault does not intersect with Hosgri, but 3D will confirm/disaffirm that.

What action would be taken if 3D test showed Hosgri to be more than .75G? It would affect the NRC licensing process. Do they need an amendment for retro fits, or, if retro fits are not possible, must they retire the plant and look for replacement energy. There is also the issue of spent fuel --- how a larger fault/seismic event would effect that.

I asked why there was no impact studies on prior high intensity testing, since these tests had been done, according to applicants, in Siberia and off the coast of Washington? They said that there were mammal studies. They are going to get ahold of as much information on this as possible.

I asked if a risk analysis between the relative importance of the new information that might be garnered from this testing and the projected impacts to the environment have been or could be done? PG&E is pretty sure that there will be no lasting impacts, that is, they are sure the fish and mammals will leave but won't die. I asked what information that had that proved the mammals would come back --- they were going to get me more info on this.

We agreed that I would meet with them and whatever experts they had, most likely at the Oceanside/Oct commission meeting.

# FORM FOR DISCLOSURE OF EX PARTE COMMUNICATIONS

Name or description of project, LPC, etc.: PG&E -Diablo Canyon  
Sept 21

Date and time of receipt of communication: \_\_\_\_\_  
telephone

Location of communication: \_\_\_\_\_  
Michael Jasney, Karen Garrison NRDC

Type of communication (letter, facsimile, etc.): \_\_\_\_\_

Person(s) initiating communication: Bochco

Detailed substantive description of content of communication:  
(Attach a copy of the complete text of any written material received.)

\_\_\_Went through slide presentation which is attached. Started with brief discussion of Navy studies of the effect on human divers to underwater sonar. 145 db was the maximum. Sensitive mammals respond to 90db and above. The slides show how the airgun sound reverberates in the water --- Diablo project is going to use 18 airguns, repeating sound every 12 seconds for 24 hours per day for over 50 days. Levels of db that can cause injury : 120db and for each db, increase intensity by ten times.

Slide 6 shows that whales subject to airguns fell silent and left the area. The foraging areas are where they need to eat and where they communicate to each other where food is ---- all disturbing behavior. Some animals don't leave because they cannot forage elsewhere --- they suffered the most injury.

Diablo vs past studies: this project is nearer to coast than the other studies. These coastal animals don't have anywhere to go and we don't know what the result of this activity will do. Slide 10 is a Norway study that looked at the impact on fish density and catch rates after one minor air gun blast. After 5 days, the fish had not rebounded. So impact on fisheries are unknown. Do know that the fish disappeared many miles from the site of the air gun pblast.

Slide 8 deals with Harbor porpoise\_\_whose core habitat is directly in Zone 1. Only 2000 exist in this harbor and known to be highly sensitive to human sound. React by fleeing but don't have anywhere in this project zone to go. Zone 2 runs across the core habitat, only Zone 4 is the least impactful.

No studies have been done on the sea otter and noise. Do know that Oct and Nov are key breeding season.

There has been no cost benefit analysis to this project. What uncertainty will be removed that can't be discovered by other means and how important is this

uncertainties resolution compared to the damage to the coast. Is every zone (paraticularly Zone 1) really necessary to resolve some critical uncertainty.

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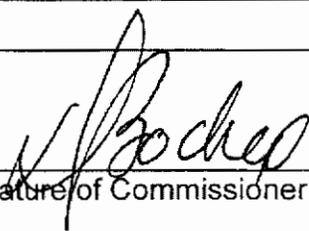
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9/21/12  
Date

  
Signature of Commissioner

If the communication was provided at the same time to staff as it was provided to a Commissioner, the communication is not ex parte and this form does not need to be filled out.

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If communication occurred within seven days of the hearing, complete this form, provide the information orally on the record of the proceeding and provide the Executive Director with a copy of any written material that was part of the communication.

## Introduction to a seismic airgun ship



Source: PGS

# How seismic works

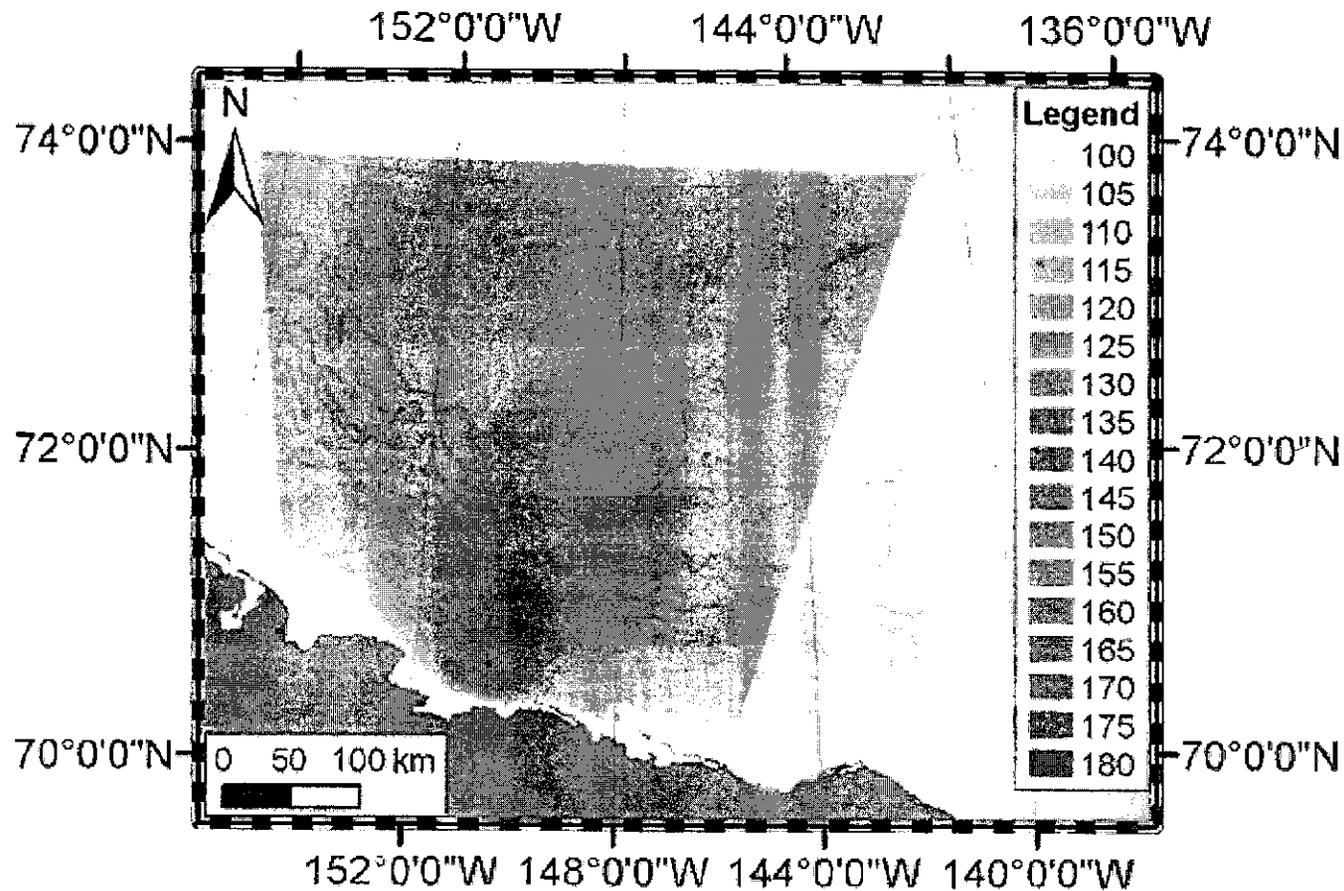


## Seismic airgun explosion



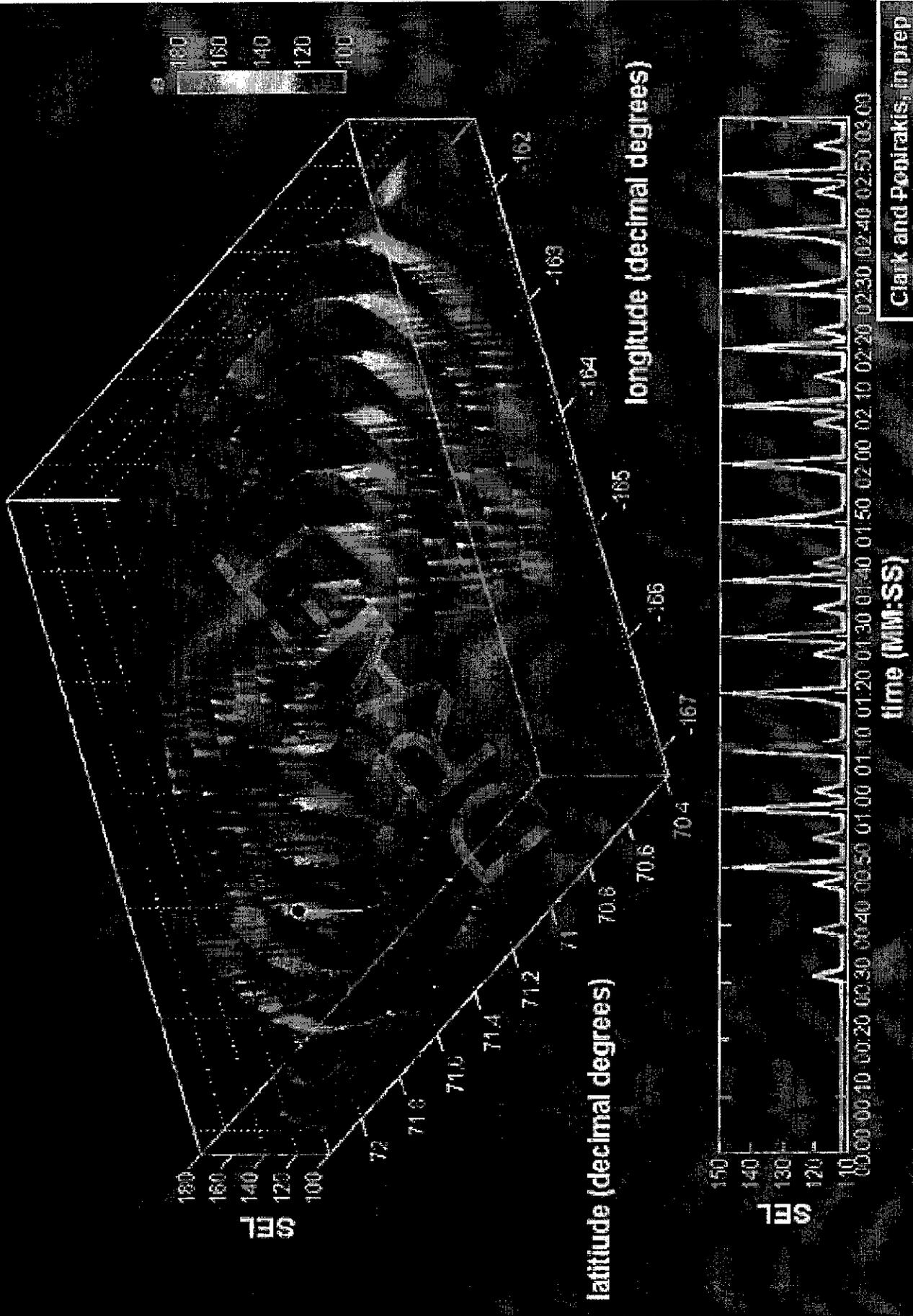
Large airgun arrays inject extremely high-pressure ( $> 250$  dB re  $1 \mu\text{Pa}$ ) acoustic impulses into the ocean

# Masking effects: modeling seismic



Omnidirectional sound energy levels from a single seismic airgun shot in Harrison Bay, North Slope, Alaska, integrated over 1 second

# Seismic acoustic "footprints" 71 sec after initial impulses

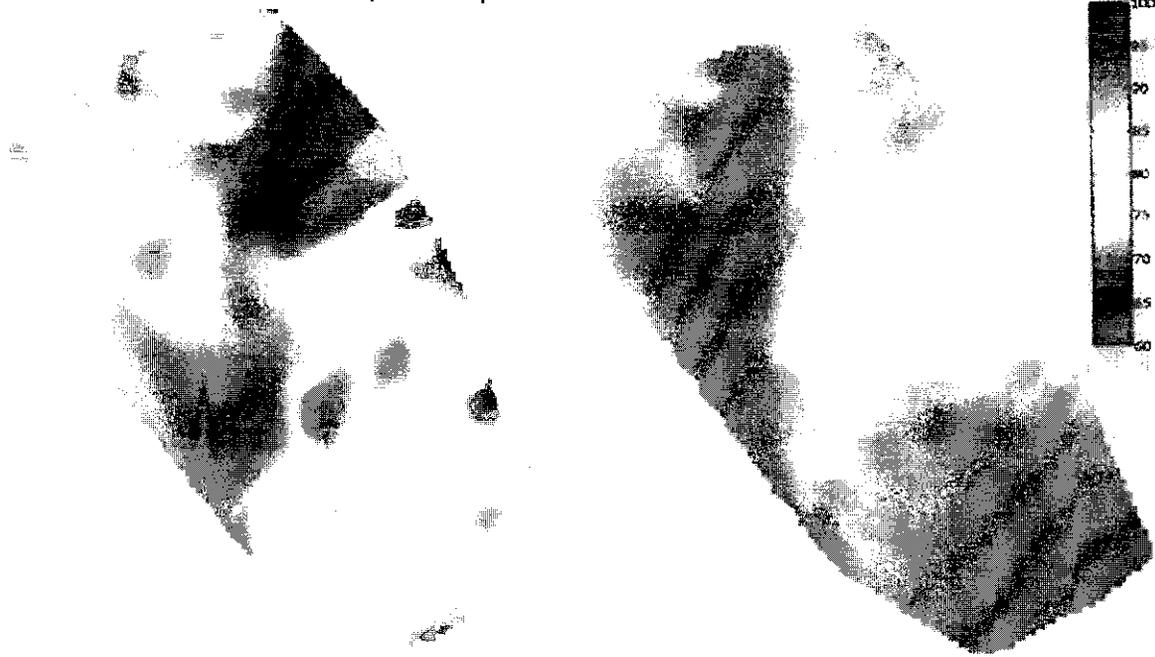


# Behavioral impacts: silencing and displacement

Fin Whale Singers

Seismic Airgun Acoustic Footprint

100,000 Sq. Mile Habitat



## Findings

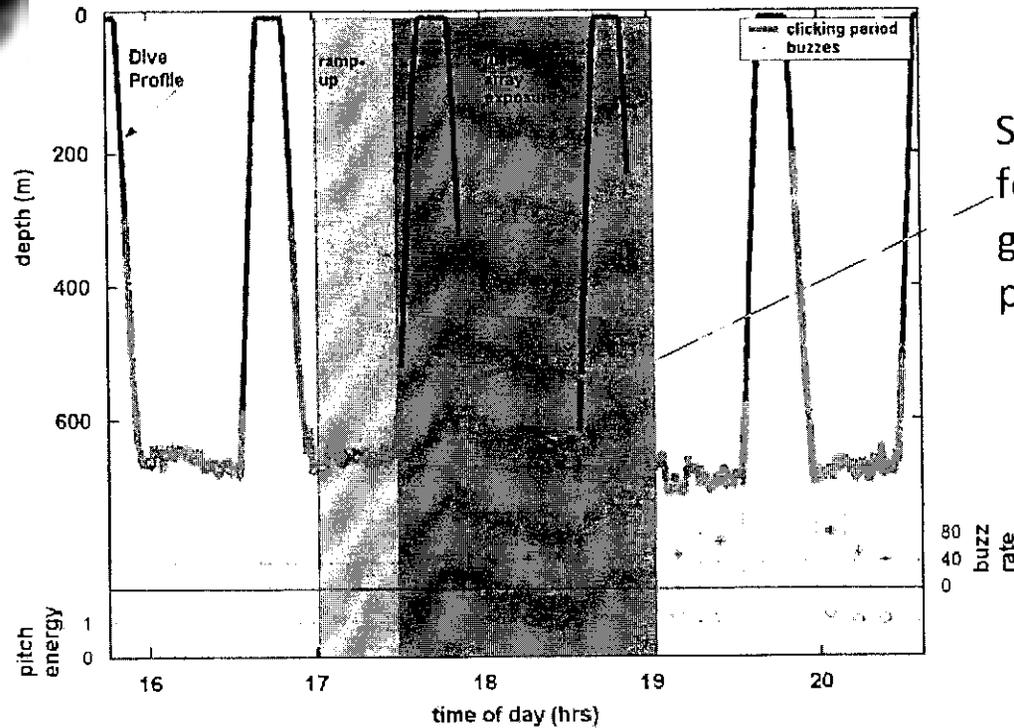
Humpback and fin whales generally fall silent within this area for the duration of shooting

The few male fin whales that continue to vocalize are displaced from the area

Any whale calls within the area are “masked”

Source: Chris Clark

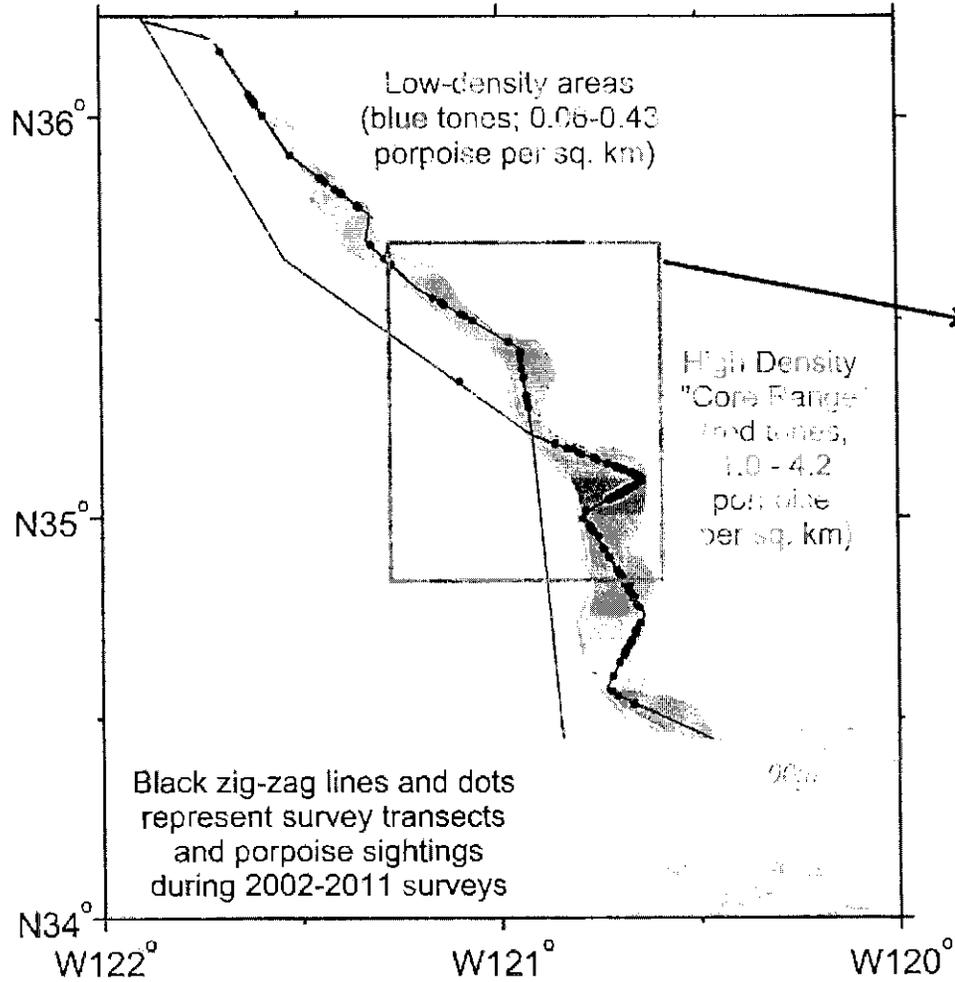
# Impacts on vital behavior: direct loss of foraging



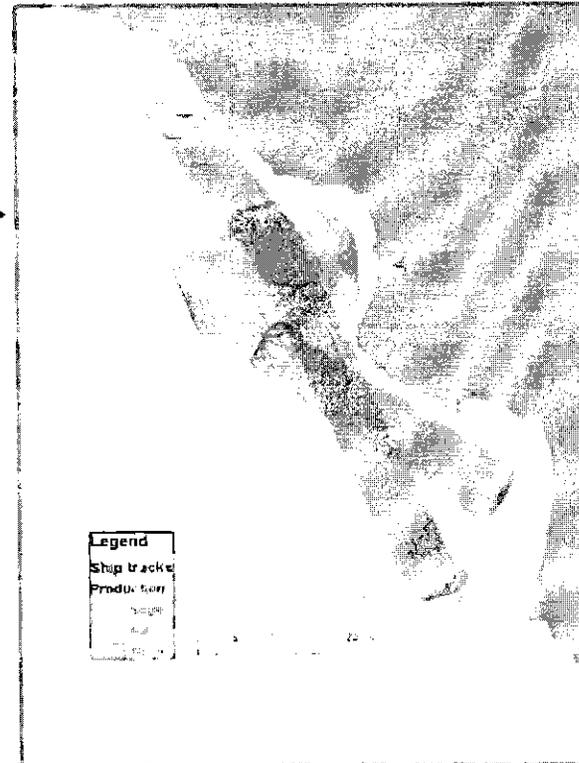
Sperm whale foraging dive: green dots denote prey capture noise

Prey capture decreased substantially (~20% on average) during seismic shooting, even at relatively low levels of exposure

Morro Bay Harbor Porpoise Stock  
Range-wide density patterns  
(darker colors indicate higher densities)



Proposed Seismic  
Survey Tracks  
and 160db Zone  
(Draft EIS, Appendix H)



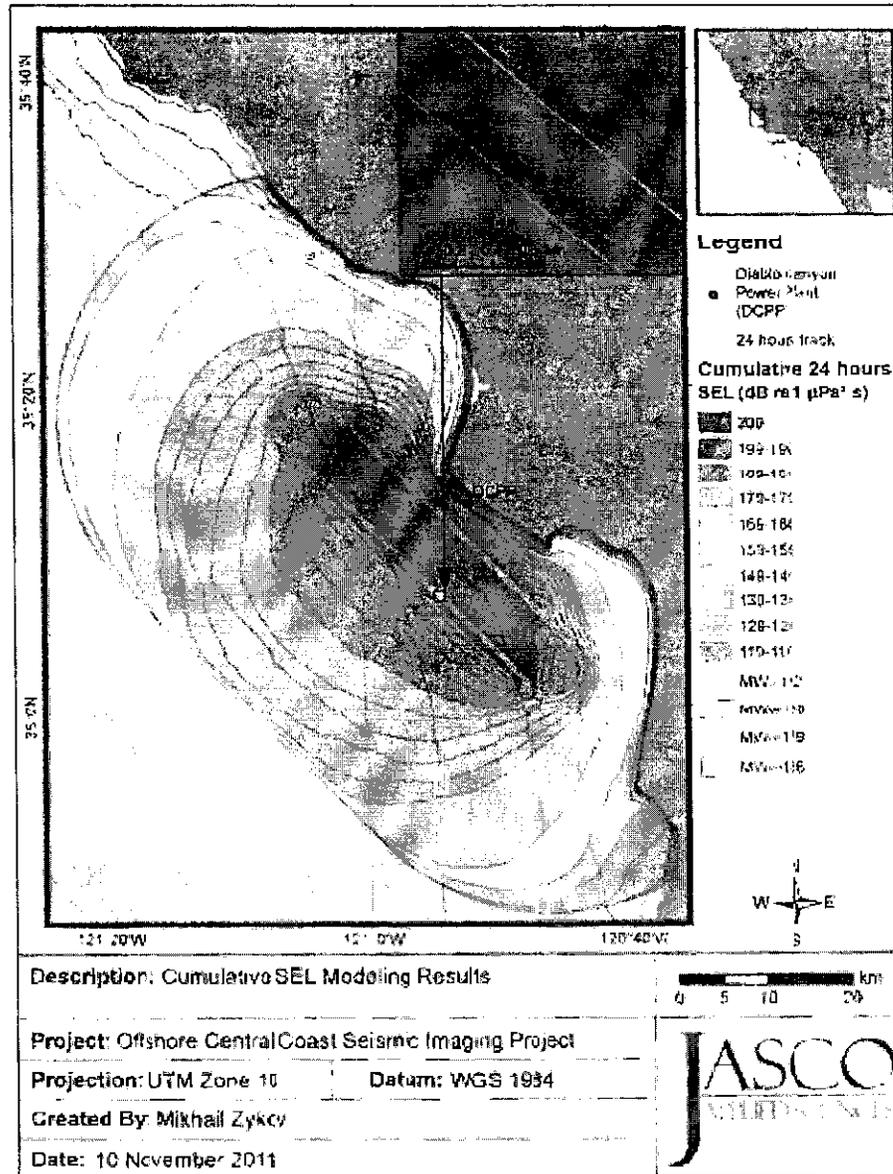
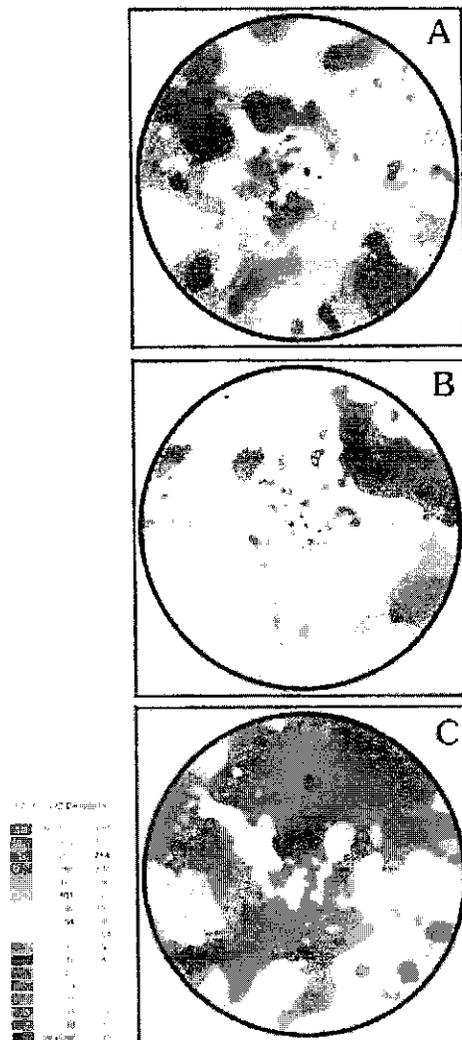


Figure 3.9 Cumulative SEL modeling results for Zone 2 showing contour lines for unweighted cumulative SEL as well as selected contours for different M-weighted marine mammal frequency group fields: 192 dB MW<sub>LF</sub>, 198 dB MW<sub>MF</sub>, 179 dB MW<sub>HF</sub>, and 186 dB MW<sub>BP</sub>.

# Direct impacts on fisheries



Acoustic densities of cod and haddock

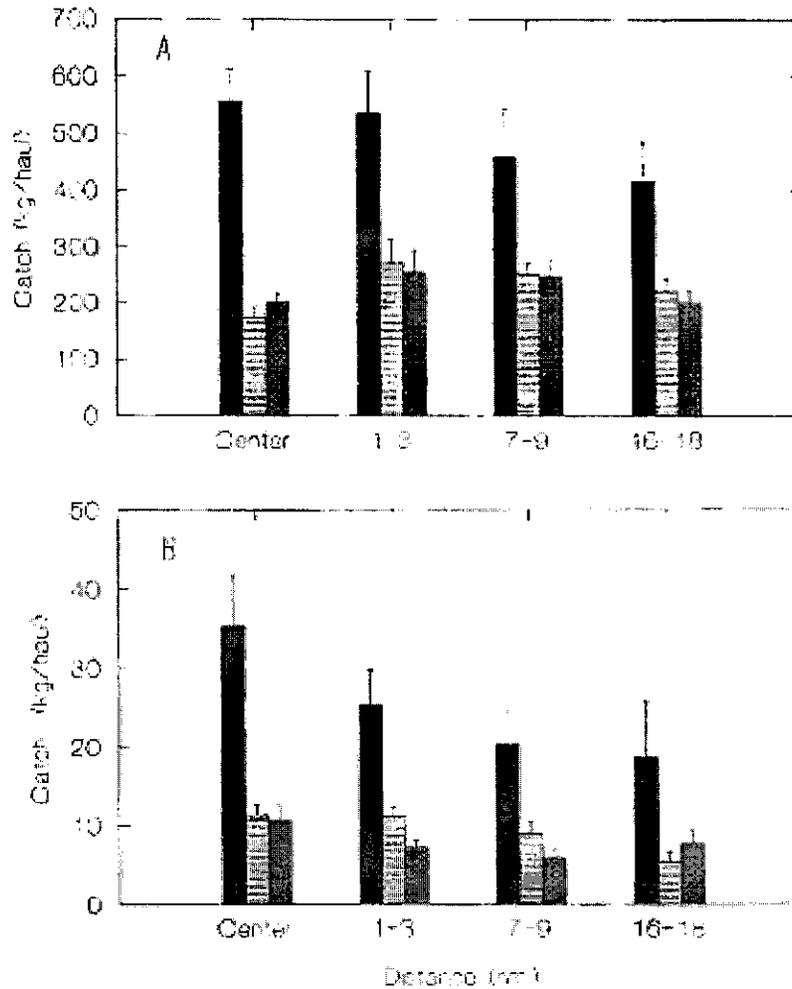
...before shooting

...during shooting

...and after shooting

Diameter of study area was 40 nm, with the seismic survey at the center

## Direct impacts on fisheries



Average trawl catch rates of cod and haddock before (solid), during (striped), and after (gray) seismic shooting, by distance in nautical miles from the shooting area.

Source: Engas et al. 1996



California Coastal Commission  
Ex Parte Communication

Date and Time of Communication: 9/12/12, 7:30 A.M. Moody's Coffee shop  
Mendocino, California.

Project Description: Central Coastal California Seismic Imaging Project. Purpose; A brief review of PG&e's plans to request, a CDP permit and FCCD in order to perform 3D geophysical survey. The survey will be designed to determine the affects of possible faults on the Diablo Canyon Power Plant.

I, Commissioner Martha McClure had an ex parte communication with David Neish, David Neish Jr. and L. Jearl Strickland, P.E., director of Nuclear Project, PG&E. Mr. Neish and Mr. Strickland reviewed the attached briefing booklet. Both men advised me that this issue may be on the October Agenda.

Commissioner Martha McClure

 Date 9/19/12

**RECEIVED**

SEP 26 2012

CALIFORNIA  
COASTAL COMMISSION

**E-12-005**  
**PG&E SEISMIC SURVEY**

**APPLICANT:**  
**PACIFIC GAS & ELECTRIC Co.**



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State Agency Relations

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October 26, 2012

**RECEIVED**

OCT 26 2012

CALIFORNIA  
COASTAL COMMISSION  
NORTH CENTRAL COAST

Charles Lester, Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Dear Mr. Lester:

On behalf of Pacific Gas & Electric Company (PG&E), I would like to begin by thanking you and your staff for the many hours of work already undertaken in processing the application for our high-energy seismic survey (HESS) project. This survey was recommended by the California Energy Commission (CEC) in its report pursuant to Assembly Bill (AB) 1632 (Blakeslee, Chapter 722, Statutes of 2006), and subsequently required and funded by the California Public Utilities Commission (CPUC) in Decisions 10-08-003 and 12-09-008. The project received a fully certified environmental impact report (EIR) and related geophysical survey permit from the California State Lands Commission (CSLC) in August of this year.

As you know, the scope of PG&E's project has been reduced on two occasions since its inception. The first reduction was by the CSLC, which eliminated Box 3 to arrive at an environmentally preferred alternative – one that took the project from 41 to 33 days of sound source activity and reduced the project's proximity to the Monterey Bay National Marine Sanctuary and the White Rock and Cambria State Marine Conservation Areas. More recently, in an effort to take more of a pilot approach that might allow our work to begin this year, PG&E further reduced the scope from three boxes to one, reducing the number of days of seismic survey from 33 to 10, with a commensurate reduction in environmental impact. Survey Box 4, located in Estero Bay, is the most straightforward target for data acquisition. Running a series of 'dip' lines that are nearly perpendicular to expected structure will enable relatively straightforward 3D imaging of Hosgri, Los Osos and Shoreline fault zones and their intersections/interaction – a significant improvement to what is currently available using older data.

Our rationale for this reduction to less than a quarter of the original project is to prove both the appropriateness of the survey vessel and streamer array, and the robustness of our environmental mitigation and monitoring programs while minimizing potential environmental impacts and avoiding any Marine Protected Area (MPA). In addition to allowing us to demonstrate the technology and environmental protections built into the larger project, moving forward this year with the Box 4 survey will allow PG&E to determine whether it is

necessary to continue with survey Boxes 1 and 2 in 2013. For these reasons, and the reasons set forth in the analysis below, we urge the Commission staff to support issuance of a coastal development permit (CDP) and a finding of consistency with the federal Coastal Zone Management Act.

### **Why is PG&E Seeking to Permit the HESS Project?**

As mentioned briefly above, the CEC's legislatively mandated report, "Assessment of California's Operating Nuclear Plants,"<sup>1</sup> recommended that PG&E use three-dimensional (3D) geophysical seismic reflection mapping and other advanced techniques to explore fault zones near Diablo Canyon. The CEC found:

***The deep geometry of the faults that bound the San Luis-Pismo block, where DCPD sits is not well enough understood to rule out a San Simeon-type earthquake directly beneath the plant.*** It is necessary to better define the deep geometry of bounding faults of the San Luis-Pismo block and to better understand the lateral continuity of these fault zones. Although these fault zones are unlikely to replace the Hosgri Fault as the dominant source of seismic hazard at the plant, ***improved characterization of these fault zones would refine estimates of the ground motion that is likely to occur at different frequencies. This would be significant for future engineering vulnerability assessments.*** [Emphasis added]

...

***High quality three-dimensional geophysical seismic reflection mapping*** could resolve questions about the characterization of the Hosgri Fault and ***might change estimates of the seismic hazard at the plant.*** Similarly, direct imaging of the subsurface structure at Diablo Canyon could determine if faults exist near the site that do not break the surface and could also serve to refine the knowledge of the deep geometry, continuity, and interaction of poorly expressed faults that comprise the structural boundaries of the San Luis-Pismo block. [Emphasis added.]

These points are included in a list of 10 geophysical study targets identified by PG&E for the Central Coastal California Seismic Imaging Project (CCCSIP) and reviewed by the CPUC-convened Independent Peer Review Panel (IPRP). PG&E's current application for the Box 4 HESS project is a subset of the CCCSIP.

PG&E has had a great deal of success in conducting *onshore* seismic surveys in the area surrounding DCPD and the Irish Hills (part of the San Luis-Pismo block) without adverse environmental or cultural impacts. Here, low-energy (Accelerated Weight Drop) and high-energy (Vibroseis) surveys are being used to provide high-resolution images of fault structures at depth and correlate them with surface geologic features. These studies are

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<sup>1</sup> California Energy Commission, 2008, "An Assessment of California's Nuclear Power Plants: AB1632 Report," CEC-100-2008-009-CMF, 42 pp.

being used to constrain the *onshore* geometry (e.g. length, dip, width) of the faults that bound the San Luis-Pismo block.

Offshore, PG&E has already conducted three high-resolution, low-energy (< 2 kilojoule) 3D seismic surveys as part of its studies pursuant to the CEC's recommendations under AB 1632. These are similar in resolution and penetration to the onshore AWD surveys. These low-energy surveys have been instrumental in the identification of active faults and determining their rates of motion.

The proposed *offshore* HESS surveys represent the marine analog to the onshore Vibroseis surveys, allowing deeper penetration and improved imaging of not only deep-fault geometry, but the lateral continuity and connectivity of these fault zones. The low- and high-energy onshore and offshore seismic surveys will complement each other to provide an improved characterization of the geologic and tectonic setting of DCP. This imaging will allow PG&E to address the issues raised by both the CEC and the IPRP and better inform engineering vulnerability assessments.

Finally, the importance of the project has been underscored by letters of support from both the CPUC and the CPUC's IPRP. The CPUC's October 12<sup>th</sup> letter emphasized the importance of the Box 4 survey being performed on schedule in 2012. The IPRP's October 25, 2012 letter emphasized the consensus position that a Box 4 survey could provide valuable information about the faults that pose the greatest seismic hazard to the Diablo Canyon nuclear power plant.

### **Why Are PG&E's Existing Seismic Data Not Sufficient?**

For more than 30 years, PG&E has maintained a Long Term Seismic Program (LTSP) to study seismic issues and perform periodic seismic reviews of Diablo Canyon. This program, using state-of-the-art-technology, has yielded an impressive set of geologic and geophysical data that have enhanced our understanding of the Hosgri fault and other geologic features in the area.

State-of-the-art technology, however, continues to evolve. One example is the development of differential geographic positioning system (DGPS) navigation that has revolutionized PG&E's ability to perform high resolution surveys like the recent multibeam echo sounding and low energy PCable seismic reflection surveys offshore DCP. Another example is high energy marine seismic reflection data. The majority of high-energy seismic data that exist for the offshore areas of the southern Central Coast was collected during the 1970's and 1980's in support of oil exploration and is primarily two-dimensional (2D). While much of these data were evaluated as part of the original PG&E LTSP in the late 1980's, the majority of these surveys imaged targets outside of the area of immediate interest to PG&E.

Modern data collection and processing techniques, including 3D seismic, have been demonstrated to greatly improve imaging of complex geologic structures. Older data were

collected with widely-spaced hydrophone arrays that limit application of these modern processing techniques. While some of these new techniques have been applied to older data, many older data cannot be reprocessed due to differences in how these data were collected, the quality of the navigation, the hardware used, etc. Many of these older data are intrinsically 2D in nature and cannot be used to construct 3D images; dense spacing of 2D profiles cannot image 3D fault geometry correctly.

The state-of-the-art, high-energy 3D technology that PG&E is now seeking to employ with its HESS project will provide considerably more information about the deeper geometry of these faults, as well as their lateral continuity and connectivity with other fault zones. Finally, as explained earlier, PG&E was instructed by the CPUC to complete 3D studies pursuant to the recommendations of the CEC.

**As a Coastal-dependent Industrial Facility, Diablo Canyon's  
HESS Project Meets the Requirements of PRC Sec. 30260  
and Should be Granted a CDP**

Public Resources Code Section 30260 provides that a permit may be issued to a coastal-dependent industrial facility like PG&E's Diablo Canyon nuclear power plant even where it is not otherwise consistent with the Coastal Act if: 1) alternatives are infeasible or more environmentally damaging; 2) to do otherwise would adversely affect the public welfare; and 3) the environmental effects of the project are mitigated to the maximum extent feasible. PG&E's request for approval to proceed with surveys in Box 4 should be approved under these criteria for the following reasons:

**Box 4 is the Environmentally Preferred Alternative**

CSLC considered four alternatives in its full California Environmental Quality Act (CEQA) process: 1) the "no project" alternative; 2) a phased project that would be performed over two years; 3) a downscaled project (as mentioned earlier) eliminating one of the four proposed survey boxes; and 4) PG&E's 4-box survey as originally proposed. The CSLC selected alternative 3 as its environmentally preferred alternative, reducing the scope of the project to approximately three-quarters of the active days originally proposed.

PG&E's current proposal to do only Box 4 further reduces the project to one-quarter of its original duration, and avoids any work within the Point Buchan Marine Protected Area so as to further minimize any environmental impact. Box 4 was identified as the area with the least potential environmental impact due to lower harbor porpoise population densities.

This reduction to the shortest-duration box incorporates the 2-year phased approach urged by the Natural Resources Defense Council (NRDC), and also accommodates their position that the work be performed in the mid-November to mid-December timeframe. NRDC's rationale in seeking a 2-year, phased survey was that, if the results of the survey showed that the Franciscan Formation offshore of Diablo Canyon did not image well, or if other

results were not favorable, there would be time to learn that before proceeding with any further work. Those goals will be achieved in the Box 4 approach, in addition to the very real possibility that the answers gleaned from the Box 4 survey may render further high-energy work unnecessary. For example, a well-imaged Hosgri fault with no appreciable dip at depth towards the plant, combined with an imaged Shoreline fault with only minor stratigraphic offsets (along with no measured offset of Holocene aged channels in the low-energy P-cable 3D work) would likely allow PG&E to stop collecting additional high-energy seismic data.

### **Other Technology Choices are Infeasible**

One member of the CPUC's IPRP, San Luis Obispo County Supervisor Bruce Gibson, has raised concerns that PG&E's selection of an academic survey vessel with a 4-streamer array is not appropriate for the task. Geophysicists from the Scripps Institute of Oceanography and the University of Nevada, Reno, in addition to PG&E's Geosciences Department, have refuted that contention to the satisfaction of the members of the CSLC.

To the extent that the Coastal Commission staff still feels that Gibson's contention raises another potential and unanalyzed, environmentally preferred alternative – PG&E counters that while a wider 10-streamer array could reduce the number of survey lines, it is 3 times wider than the proposed array, it has a significantly larger turning radius (3500 m v 2500 m) and it is more cumbersome – having reduced maneuverability during line turns. The addition of six more streamers also increases the risk to smaller boats that might get entangled in the tow lines or the tail buoys, and would require the use of additional chase boats for monitoring and "traffic control," with commensurate increases in emissions and other environmental impacts.

With regard to the particular seismic data we are seeking to acquire, wide-swath geometry like Gibson's 10-streamer array produces poor seismic coverage at near offsets (or source-receiver ranges) that destroys the shallow portion of the seismic image. The shallow-most section is critical when linking very high-resolution imagery such as 3D PCable (low-energy) work with deeper HESS results. As PG&E and its contractors were able to convince CSLC members, the 4-streamer array is the right tool for this task.

### **Mitigated to the Fullest Extent Feasible**

Since mid-2012, PG&E has been working with state and federal resources agencies and with non-governmental organizations to identify the most robust suite of mitigation measures and to develop a monitoring program for mammals, fish, and other marine life. These include a 1.1-mile exclusion zone for specified marine mammals requiring PG&E to suspend operation until the mammal leaves that radius, weekly aerial monitoring (more stringent than the Commission's own HESS standards), ramp-up protocols for the air guns, and passive acoustical monitoring, to name just a few. A comprehensive list of mitigation requirements, in addition to monitoring programs exceeding \$8 million for the overall project, is attached to this letter.

In addition, PG&E has been meeting with fishing groups from Morro Bay and San Luis Bay in an effort to reach a global compensation agreement with them. In the absence of an agreement, or should an agreement be reached but one or more fishers have losses in excess of what they have received under a settlement, PG&E has a well-staffed claims department ready to assist applicants in receiving additional compensation. At the request of CSLC, PG&E has added a binding arbitration process for claims arising out of the HESS project to provide a neutral appeal forum for claimants who feel they have not been fairly or adequately compensated. Finally, at the request of Coastal staff, PG&E is also adding a community liaison for fishers and others to consult in order to better understand our claims process and ensure they are dealt with fairly.

**PG&E Urges a Staff Recommendation in Support of Box 4 Survey**

In closing, PG&E believes that its HESS project meets each of the criteria under PRC Section 30260, and urges the Coastal Commission staff to recommend in favor of issuance of a CDP and a finding of consistency in order that the Box 4 survey may be completed this year.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Krausse", with a long horizontal flourish extending to the right.

Mark Krausse

Cc: Chairman Mary Shallenberger & Commissioners

# PG&E'S PROPOSED 3D HESS SURVEY MONITORING AND MITIGATION MEASURES

OCT 26 2012

CALIFORNIA  
COASTAL COMMISSION  
NORTH CENTRAL COAST

## Selection of Box 4 for 2012

The selection of Box 4 for the 2012 is a result of ongoing discussions with numerous permitting agencies and represents the portion of the proposed survey area with the least potential impacts to coastal resources. These include:

- Smallest survey area and shortest duration (9.25 days) of the currently CSLC approved survey boxes
- Lowest estimated take of marine mammals including Morro Bay harbor porpoise and southern sea otter
- November 15 to December 15 survey window has lowest impacts to fish eggs and larvae
- November 15 to December 15 survey window has lowest impacts commercial and recreational fishing in project area
- Includes both deep water and near-shore areas with the smallest percentage of shallow areas within three CSLC approved survey boxes
- Smallest survey footprint on hard-bottom substrate
- Survey lines do not enter any Marine Protected Areas

In addition to the factors outlined above, the PG&E 3D seismic survey will be mitigated by one of the most extensive mitigation programs that have been developed in support of an offshore 3D seismic survey. The following outlines some of the key measures included in this program.

## OVERALL MITIGATION PROGRAM

### Air Quality Impacts

Air emissions will be reduced through implementation of San Luis Obispo County Air Pollution Control District (APCD) Standard Mitigation Measures for Construction including;

- Implementation of Best Available Control Technology (BACT) Measures.
- Implementation of Fugitive Dust Controls.
- Prepare a Project-Specific Emission Reduction Program.

### Marine Biological Impacts

**Survey Timing.** To be less disruptive to migrating and summer season whales, the survey was originally proposed to be timed to occur during the months of September through December. This timing has been refined to November 15 to December 15 to further reduce potential impacts to local resources.

**Establishment of Safety Zone and Exclusion Zone.** PG&E used acoustic models to predict sound levels associated with the air gun array, and this information was used to establish both a Safety Zone (the distance from the air gun array at which noise levels are >160 dB re 1  $\mu$ Pa) and an Exclusion Zone (the distance from the air gun array at which noise levels are >180 dB re 1  $\mu$ Pa) in marine waters around the air guns. **Augmented by: Increase Size of Exclusion Zone During Surveys.** Per the requirements of the CSLC EIR, Pacific Gas & Electric Company will increase the size of the Exclusion

Zone for the full air gun array to 1.1 miles (2 kilometers) for baleen whales (mysticetes), whose hearing sensitivity overlaps the greatest with seismic air gun signals; sperm whales; and large groups of marine mammals (i.e., porpoises). Responses to such observations will be as described under APM-7 (reduce speed to avoid).

**Real-Time Sound Measurements/ Exclusion Zone Adjustments.** An acoustics contractor will perform real-time, direct underwater sound measurements during air gun deployment; these data will be used to verify and adjust the Exclusion Zone distances, as needed.

**Use of Ramp Up Process.** To warn marine wildlife in the vicinity of the air guns and provide time for them to leave the area and avoid potential injury or hearing impairment, at the start of air gun operations (after a period of no operation), the seismic operator will start off with low sound levels and gradually increase them (ramp up). **Augmented by: Increase Pre-Ramp-Up Scan Period.** Per the requirements of the CSLC EIR, Pacific Gas & Electric Company will increase the pre-ramp-up scan period to 45 minutes, especially in poor sighting conditions.

**Air Gun Operation During Turns and Transects.** During turns or brief transits between seismic transects, the seismic operator will continue firing a single air gun, to avoid periods of silence when marine wildlife could otherwise attempt to migrate into the Exclusion Zone.

**Aerial Surveys to Identify Presence of Marine Mammals.** PG&E will conduct aerial surveys prior to, during and following the survey operations. **Augmented by: Expand Pre-Survey to 8.6 Miles (14 Kilometers) and Perform 10 Days in Advance of Survey.** Per the requirements of the CSLC EIR, PG&E will conduct a pre-survey of the Project area and vicinity to 8.6 miles (14 kilometers) (twice the maximum 160-decibel re 1  $\mu$ Pa root mean square isopleth) for mysticetes (baleen whales), approximately 10 days prior to the start of the survey to allow for analysis of data obtained during the pre-survey and to make adjustments to the survey schedule as needed.

Aerial survey efforts will be further expanded to include direct coordination with the NMFS and FWS to conduct lower altitude surveys for Morro Bay harbor porpoise and sea otters as part of the NMFS lead expanded Adaptive Management Plan and Stranding Management Plan.

**Marine Species Protocols.** PG&E will prepare protocols to be implemented by all Project-related vessels for non-survey transit for the entirety of the Project.

**Use of Marine Mammal Monitors During Surveys.** Qualified Marine Mammal Observers (MMOs) will be onboard the primary seismic vessel whenever the air guns are firing during daylight, and during the 30-minute periods prior to ramp-ups, as well as during ramp-ups. Their role will be to watch for and identify marine mammals; record their numbers, distances, and reactions to the survey operations; and document observations. A scout vessel with qualified MMOs will traverse the Exclusion Zone to monitor marine wildlife within the survey area and report to primary vessel operator if any animals are observed. **Augmented by two additional mitigations: Required Marine Mammal Observer Qualifications, Use of Equipment and Procedures to Enhance Detection Rates, and Performance of Nighttime Monitoring.** The Marine Mammal Observers (MMOs) used for the Project will be independent and demonstrated to have had considerable experience sighting local species and using Passive Acoustic Monitoring. Appropriate equipment/procedures will be used to improve daytime detection rates (including big-eye binoculars, sufficient numbers of MMOs, and required rest periods). Monitoring will be performed during the nighttime using Passive Acoustic Monitoring that may be supplemented by

equipment to enhance night detection rates (including advanced infrared equipment, sodium lighting, and/or millimeter waves radar).

**Monitoring Using Two Scout Boats with Marine Mammal Observers During Surveys.** A total of two scout boats with MMOs will be used to increase detection rates within the Exclusion Zone. These boats will maintain a distance of half the Exclusion Zone on either side of the survey vessel. There will be a minimum of three MMOs assigned to each vessel (survey vessel and two scout boats), with two MMOs on watch at a time. The third would rest and then rotate with other MMOs to enhance vigilance during watch times.

**Use of Passive Acoustic Monitoring.** Passive Acoustic Monitoring (PAM) will be available to supplement visual monitoring in conditions of poor visibility or low lighting. When a vocalization is detected while visual observations are in progress, the acoustic Marine Mammal Observer (MMO) will contact the visual MMO immediately, to alert him/her to the presence of cetaceans (if they have not already been seen), and, if necessary, to allow a power down or shut down to be initiated.

**Avoidance of Pinniped Haul-Outs.** Pacific Gas & Electric Company will establish a flight plan for the aerial surveys that includes plans to avoid local pinniped haul-outs or to maintain sufficient altitude (greater than 500 feet [152 meters] above sea level) when passing local pinniped haulouts.

**Perform Track Lines with Highest Mammal Densities During Daylight Hours.** To the extent feasible, Pacific Gas & Electric Company will perform the inshore tracks of the seismic survey to coincide with daylight hours. In addition, Pacific Gas & Electric Company will conduct surveys near Church Rock (North 35° 20.675 West 120° 59.049) during daylight hours to the extent possible.

**Adaptive Management in Case of Multiple Shutdowns.** If more than three shutdowns occur for mysticete whales observed in the Exclusion Zone, PG&E will initiate an immediate project review in consultation with the California State Lands Commission and the National Marine Fisheries Service to assess the safety of Project area conditions.

**Contingency for Sighting of North Pacific Right Whale.** PG&E will shut down air guns if a North Pacific right whale is sighted at any distance from the survey vessel.

### **Commercial and Recreational Fishing Impacts**

**Fishers Claims Program.** PG&E has established a claims process overseen by an independent ombudsman to address economic impacts to commercial fishers caused by the survey activities. These claims will be facilitated by the JOFLO (ombudsman) and will be based on documented losses associated with the survey activities.

**Survey Timing to Reduce Impacts to Fishing and Recreational Uses.** To be less disruptive to commercial and recreational fishing operations and other recreational uses, the survey will be timed to occur during the months of September through December. To reduce the overall Project duration, survey operations will be conducted 24 hours per day, 7 days per week (24/7).

### **Terrestrial Biological Impacts**

**Worker Environmental Awareness Training Program (WEAP).** A WEAP will be prepared and presented to all personnel at the beginning of the Project. The WEAP will discuss sensitive species and

habitat areas with the potential to occur in the seismic survey area, with an emphasis on special-status wildlife and plant species. The program will also explain the importance of avoiding disturbance and implementing measures to protect sensitive resources during Project activities.

#### **Biological Monitoring During Geophone Placement, Geophone Retrieval, and Survey Activities.**

A qualified biologist will be on site during the wireless nodal geophone placement and retrieval activities. These measures include:

- Pre-Activity Biological Survey
- Establishment of Exclusion Zones Around Active Owl Burrows.
- Kangaroo Rat Avoidance and Minimization Measures.
- Establishment of Exclusion Zones Around Morro Shoulderband Snails (MSS).
- Avoidance of Streams and Wetlands.
- Avoidance of Western Snowy Plover, California Least Tern, California Clapper Rail, and California Black Rail Nesting Habitats.
- Lighting Use During Nighttime Survey Activities.
- Ongoing Trash Removal.
- Limited Off-Road Vehicle Travel.
- Reduce Light Radiating from Survey Vessels.

#### **Cultural Resource Impacts**

**Cultural Resource Monitoring during Survey Activities.** Cultural resource specialists will survey the proposed receiver alignments before any Project-related activities begin. Cultural resource monitors will also accompany each field team during pre-activity surveys and during seismic survey operations in areas with potential for cultural resources.

#### **Additional Mitigation Measures**

**Community Communications Plan.** PG&E has developed an extensive Community Communication Plan designed to provide interested parties with up to date information on the survey activities. These communications will include an extensive outreach program to explain the purpose of the proposed survey, the anticipated areas where the survey is ongoing and ways to request additional information on the project. Particular attention will be focused on providing real-time information of the survey vessel location to offshore vessel operators including commercial and recreational fishers.

The following measures will be implemented to reduce potential impacts from the proposed project. These include:

- Brush Fire Prevention Procedures.
- Emergency Response Procedures.
- Issuance of Notices.
- Oil Spill Contingency Plan.
- Observation and Removal of Divers from Waters in Active Survey Area.
- Limit Weekend Hours of Operation.

#### **COMPREHENSIVE MONITORING PROGRAM**

## Developed in Consultation with Resource Agencies

In addition to those mitigation and monitoring programs developed by PG&E in support of the seismic survey project implementation (see below), PG&E has agreed to participate in a Comprehensive Monitoring Program. This program has been developed in consultation with numerous resource agencies and research groups including NMFS, USFWS, CDFD, The Nature Conservancy, Ocean Science Trust, Cal Poly San Luis Obispo, and Moss Landing Marine Laboratories. These programs are summarized below.

- **Harbor Porpoise Monitoring Program.** PG&E has agreed to fund a Harbor Porpoise Monitoring Program that will be conducted by the NMFS. The program involves a direct collaboration between NMFS, U.S. Geological Survey (USGS), Brandon Southall (SEA, Inc.), and possibly others. Monitoring would involve a 3-pronged approach to collect data before, during, and after the seismic surveys.
- **Sea Otter Monitoring Program.** PG&E has agreed to fund a Sea Otter Monitoring Program that will be conducted by the USFWS, CDFG Marine Wildlife Veterinary Care and Research Center (MWVCR), the Monterey Bay Aquarium Sea Otter Research and Conservation Department, and University of California and Santa Cruz and Davis. The monitoring program will provide a real-time monitoring infrastructure with which to detect and measure levels of harassment caused by the surveys, as required by the USFWS, while at the same time providing useful information on behavioral response thresholds as a function of sound exposure for sea otters. This program was initiated on October 2, 2012.
- **Stranding Response Plan.** PG&E has agreed to support a Stranding Response Plan developed by the NMFS, USFWS and CDFG. This plan will be implemented in close coordination with the Harbor Porpoise and Sea Otter Monitoring Programs. Data from the program will also be used in the evaluation of impacts under the Adaptive Management Program.
- **Aerial Survey Program.** NMFS will conduct aerial surveys in conjunction with the proposed seismic survey operations as outlined in the HESS Guidelines and in accordance with the requirements established by the CSLC FEIR mitigation measures (CSLC, 2012). In addition to these aerial surveys, NMFS/USFWS will be conducting low level aerial surveys designed to monitor southern sea otter and Morro Bay harbor porpoise movements in response to the seismic survey operations. Baseline aerial surveys will commence on October 2, 2012.
- **Adaptive Management Program.** Data generated during pre-activities surveys and ongoing operational monitoring activities will actively be used during the proposed seismic survey to adjust or redirect operations should significant adverse impacts be observed to marine resources in the project area. This program will rely on data generated during the Harbor Porpoise and Sea Otter Monitoring Programs along with vessel based PSO observations.
- **Monterey Bay National Marine Sanctuary HARPs Program.** PG&E has agreement to support the placement of two High Frequency Acoustic Recording Packages (HARPs) within the project area. These monitoring devices will record vocalizations of a broad range of marine mammals, including harbor porpoise and bottlenose dolphins. One HARP will be installed within the southern boundary of the Monterey Bay NMS while the second will be installed further offshore in San Luis Bay.

**Study of the Effects of the Seismic Survey on Fishes.** PG&E has agreed to fund a two-component study to examine the short- and long-term effects of the seismic survey on fish abundance (and

invertebrates). Components of the study include: (1) Remote Operated Vehicle (ROV) surveys to assess the abundance of common rockfishes and other demersal fish and invertebrate species in sites before, during, and after the seismic survey; and (2) funding the California Collaborative Fisheries Research Program (CCFRP), which is an existing program between the fishing communities of Half Moon Bay, Moss Landing/Monterey, Morro Bay, Port San Luis and the academic institutions of Moss Landing Marine Labs and Center for Coastal Marine Sciences at Cal Poly, San Luis Obispo to study the long-term effects of the HESS on fish abundance in shallower waters. The CCFRP involves both Catch per Unit Effort (CPUE) and Commercial Trap surveys.



**E-12-005**  
**PG&E SEISMIC SURVEY**

**FEDERAL/STATE AGENCIES**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Monterey Bay National Marine Sanctuary  
99 Pacific Street, Bldg 455a  
Monterey, CA 93940

November 1, 2012

Charles Lester  
Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Dear Charles,

The Monterey Bay National Marine Sanctuary Advisory Council recently requested that I send you a letter conveying the council's concerns with PG&E's proposed seismic surveys for the Diablo Canyon nuclear power plant. This issue was discussed at the October 18 SAC meeting in Cambria. The purpose of this letter is to convey Advisory Council concerns, and their desire for the Coastal Commission to consider these at its November 14 meeting.

As you may know, NOAA-National Marine Fisheries Service (NMFS) is currently reviewing PG&E's request for an IHA (Incidental Harassment Authorization) for impacts to protected species. In September of this year, Monterey Bay National Marine Sanctuary (MBNMS) articulated its concerns about potential impacts to sanctuary resources during the comment period for an EA prepared by the National Science Foundation. The project was subsequently moved out of sanctuary waters and further confined to a smaller area. MBNMS has since worked to help make sure that if an IHA is provided, certain monitoring and permit requirements would ensure that sound levels and impacts are carefully observed and reported and mitigated.

The Advisory Council voiced two major concerns with the proposed seismic survey project. First, the council was concerned overall with the potential harmful effects of high-decibel sound on marine organisms in sanctuary waters and those that would enter sanctuary waters from the active survey area. The council felt that there was insufficient information and analysis on the effects and threshold levels. The other concern was with regard to inadequate time to understand baseline conditions prior to the survey for appropriate monitoring.

Because the proposed survey is outside sanctuary waters, MBNMS has chosen to rely on NMFS, to help ensure that sanctuary resource protection is adequately addressed. Nevertheless, the Advisory Council remains concerned for sanctuary resources and feels that the surveys should be delayed until more is known about impacts and baseline conditions in and around the target survey area.

Thank you for the opportunity to pass along the concerns of the Advisory Council.

Sincerely,  
  
Paul Michel,  
Superintendent



**Office of National Marine Sanctuaries Comments**  
**NSF's Draft EA Marine Geophysical Surveys for Central California**  
**August 10, 2012**

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**Overview Comments**

Although the NSF Draft Environmental Assessment acknowledges the presence of Monterey Bay National Marine Sanctuary, ONMS is unable to determine the potential or likely impacts that may occur to sanctuary resources as a result of this project. The Office of National Marine Sanctuaries (ONMS), administered by the National Ocean Service within NOAA, is concerned that the state and federal environmental analyses have come to different conclusions as to whether or not the project will cause significant impacts. Due to the disparity in the environmental analysis, and in the absence of key information, MBNMS staff cannot adequately determine the likely impact to national marine sanctuary resources.

In order to adequately assess the impacts to Monterey Bay National Marine Sanctuary, ONMS requests that NSF increase its level of coordination with our office and provide additional environmental detail on the scope of the project, and the potential impacts that may occur within the boundary of MBNMS.

More specific comments include:

**State and Federal environmental analysis**

Currently, there are inconsistencies between the state and federal environmental analyses regarding the level of impact to marine mammals. If NSF believes the state analysis is flawed in reaching its conclusion of significant and unavoidable impacts, or if there is additional information that has become available after the NSF Draft EA was released, the final or supplemental environmental analyses will need to explain these differences.

**Operations within the National Marine Sanctuary**

The Draft EA indicates that the R/V *Marcus G. Langseth* will be operating within MBNMS only when the vessel makes turns. However the sound and potential impact may travel into the sanctuary. Unfortunately, the Draft EA does not address the distance from the sound-source to the sanctuary, how far and at what magnitude these acoustic pulses will travel, and what will be the acoustic profile within the sanctuary from this project. Clear information is needed on the attenuation level, sonification, decibel levels, possible shock wave attenuation, and other relevant acoustic information. In addition, detail is lacking with regard to transects, e.g., when transects will be completed, at what distance from the boundary of Monterey Bay National Marine Sanctuary.

**Possible impacts to Sanctuary resources**

The Draft EA does not assess impacts to MBNMS resources in a meaningful way. For example, the impact profile in the Draft EA does not comport with the "significant and unavoidable" impacts to harbor porpoise, sea otters and dolphins that were outlined in the state Final EIR. It may be necessary to reduce the size and scope of the project to ensure negative impacts related to

sound are kept beyond the borders of the MBNMS. This critical acoustic data noted above is essential to help NSF, the applicant and ONMS to determine if a broader exclusion area is needed.

**Consultation under the NMSA**

Federal coordination and consultation under the National Marine Sanctuaries Act Section 304(d) is required for federal agency actions internal or external to a national marine sanctuary for activities that "are likely to destroy, cause the loss of, or injure any sanctuary resource". At present, we are unable to determine if such formal consultation is required without further information as requested above.

**National Marine Fisheries Service Southwest Region Comments  
NSF's Draft EA Marine Geophysical Surveys for Central California  
August 10, 2012**

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The proposed project is of concern to NMFS because various fish species, essential fish habitat, endangered species, and protected marine mammals, for which NMFS has management or consultation responsibilities under federal statutes, are present within the project area. NMFS offers the following general comments on potential impacts to these resources. NMFS would like to continue to assist the National Science Foundation with developing more detailed analysis of the potential impacts to these resources.

**Magnuson-Stevens Fishery Conservation and Management Act Comments**

NMFS is concerned that fishing restrictions during the survey period would harm the economic interests of commercial and recreational fishermen and supporting industries operating out of Morro Bay and the Port of San Luis. The proposed action may displace fishing activities to surrounding areas. NSF needs to analyze where this displacement may occur and whether this would create a safety issue for vessels further from their home ports. The Draft EA does not include recreational fisheries data necessary to evaluate economic impacts on local recreational fisheries. There is also concern about the potential short and long term biological impacts on commercially and recreationally important fish species, as well as the potential long-term economic effects to the commercial and recreational fisheries of changes in species abundance. NMFS is concerned about how the proposed action will affect rockfish courtship behavior, which occurs predominantly in the fall, and thus how it might affect larval recruitment in the spring. NMFS is also concerned about the potential for the proposed action to result in increased interactions between the drift gillnet fishery and marine mammals and sea turtles. In order to avoid the noise emitted from the air guns, these animals may move farther offshore than normal and into the area where drift gillnets are routinely placed.

*Essential Fish Habitat*

NMFS concurs with the Draft EA's conclusion that essential fish habitat (EFH) would not be permanently impacted by the proposed project. NMFS believes the proposed project would have temporary adverse effects on EFH for various species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Pacific Salmon Fishery Management Plans. The placement of geophones may impact rocky reef, kelp canopy, and seagrass habitats via direct benthic disturbance. However, given the limited spatial extent and linear arrangement of the geophones, any benthic impacts are expected to be temporary and minimal. The acoustic energy generated from seismic testing will temporarily reduce the quality of EFH via increased noise. Potential noise impacts to fishes from the seismic surveys may include mortality, permanent or temporary hearing damage, temporary hearing threshold shifts, and difficulty finding prey or avoiding

predators. However, given the Draft EA's limited quantification of noise impacts to fishes, it is difficult to determine the magnitude of this impact. NMFS believes the Draft EA would benefit by a more robust analysis and/or modeling effort. A more refined impact estimate could be used to determine whether mitigation is appropriate to compensate for impacts to fish populations.

### **Marine Mammal Protection Act Comments**

NMFS is concerned with potential impacts to marine mammals and how the baseline conditions and impacts were evaluated, and consequently how this translates into potential take as defined under the Marine Mammal Protection Act. The density estimates for many of the marine mammal species should be recalculated since the minimum population estimate ( $N_{min}$ ) was used and may not be appropriate for estimating the level of take, particularly for species like the harbor porpoise (*Phocoena phocoena*). NMFS also recommends that NSF provide justification as to why certain marine mammal species were not included in their analysis while similar species with similar distributions were considered. If take for gray whales is not anticipated nor requested, NMFS recommends that the applicant keep in close communication with NMFS to determine the start of the gray whale migration. NMFS is concerned about the proposed mitigation measures and the effectiveness of these measures for a 24/7 operation as a means to minimize impacts to marine mammals. It appears that different models were used for similar NSF-sponsored seismic surveys. It would be helpful to understand the rationale for adopting one model over the other.

NMFS appreciates the opportunity to provide input to NSF on this important project and we look forward to continuing to work with NSF. If you have any questions please contact Ms. Shelby Mendez at [Shelby.L.Mendez@noaa.gov](mailto:Shelby.L.Mendez@noaa.gov) or 562-980-4094.

**MEMORANDUM FOR: Monterey Bay National Marine Sanctuary Advisory Council**

**FROM: Paul Michel, Superintendent**

**SUBJECT: Proposed PG&E Seismic Survey Project**

In preparation for the October 18 SAC meeting in Cambria and the agenda item regarding the proposed PG&E Seismic Surveys, I have prepared the following summary for your information.

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PG&E and the National Science Foundation (NSF) are proposing to conduct a high energy seismic survey in the vicinity of the Diablo Canyon power plant and known offshore fault zones. PG&E's seismic research was called for by the state and includes the use of on-shore and off-shore low and high-energy seismic studies, as well as the installation of ocean-bottom sensors to detect seismic activity. The data will provide a more accurate and detailed picture of the region's complex geology, and will help further define the level of seismic activity in the region of Diablo Canyon. PG&E will use this data to support its ongoing seismic safety program.

NOAA is reviewing federal and state environmental documents regarding potential biological impacts from marine seismic tests on whales and other federally protected species. The agency will determine if the project can be conducted in a manner compliant with federal natural resource protection laws, which include the Marine Mammal Protection Act, the Endangered Species Act, the Magnuson Stevens Fisheries Act, and the National Marine Sanctuaries Act. The proposed survey would occur south of the boundary of the Monterey Bay National Marine Sanctuary and models used to estimate potential impacts to marine life predict that the intensity of sound reaching the southern boundary of the sanctuary would likely not be high enough to affect sanctuary resources, based on threshold values used by NOAA. However, levels within the sanctuary are predicted to approach these thresholds, leading to interest in validation of model predictions and in comprehensive monitoring of sound levels and marine mammal distributions and densities before, during and after the survey.

The National Science Foundation (NSF), which prepared the NEPA document and plans to carry out the surveys using their research vessel (in partnership with PG&E), has committed to complete a "source verification phase" prior to beginning the survey. This phase is designed to measure the actual level of underwater ensonification that occurs to determine whether these values match those predicted by models. This will help determine whether predictions that sanctuary resources are unlikely to be affected by the survey are accurate.

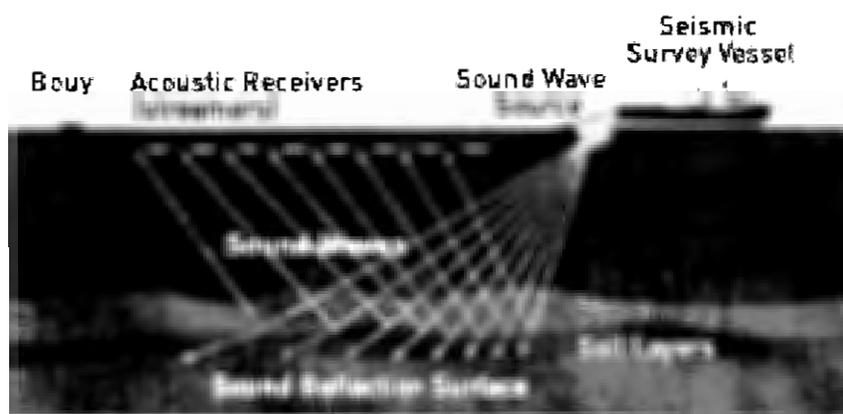
Regardless of the outcome of this verification phase, NOAA has asserted that should the proposed project go forward, the need for impacts analysis to sanctuary resources be addressed within the comprehensive mitigation and monitoring plans funded by PG&E. As the sanctuary's concerns relate to the impacts of sound on marine mammal and fish species, they overlap with NOAA Fisheries' concerns and thus several line offices within NOAA have worked collectively to identify and recommend appropriate mitigation and monitoring. These plans include fishery resource assessments south of the sanctuary, shoreline stranding response spanning the survey area and inclusive of the southern sanctuary, aerial survey efforts targeting both large whales and smaller coastal populations (sea otters and harbor porpoises), and "listening" based monitoring which uses three types of passive acoustic technologies. Two forms of passive acoustic monitoring will focus mainly on monitoring the behavior of inshore populations of concern, sea otters and harbor porpoises in particular, south of the sanctuary and central to the seismic survey area. However, one listening station for these systems will be placed in the southern sanctuary. A final form of passive acoustic monitoring will focus on the offshore levels of sound from the seismic surveys and detection of large whales in the sanctuary, with an additional listening station further south.

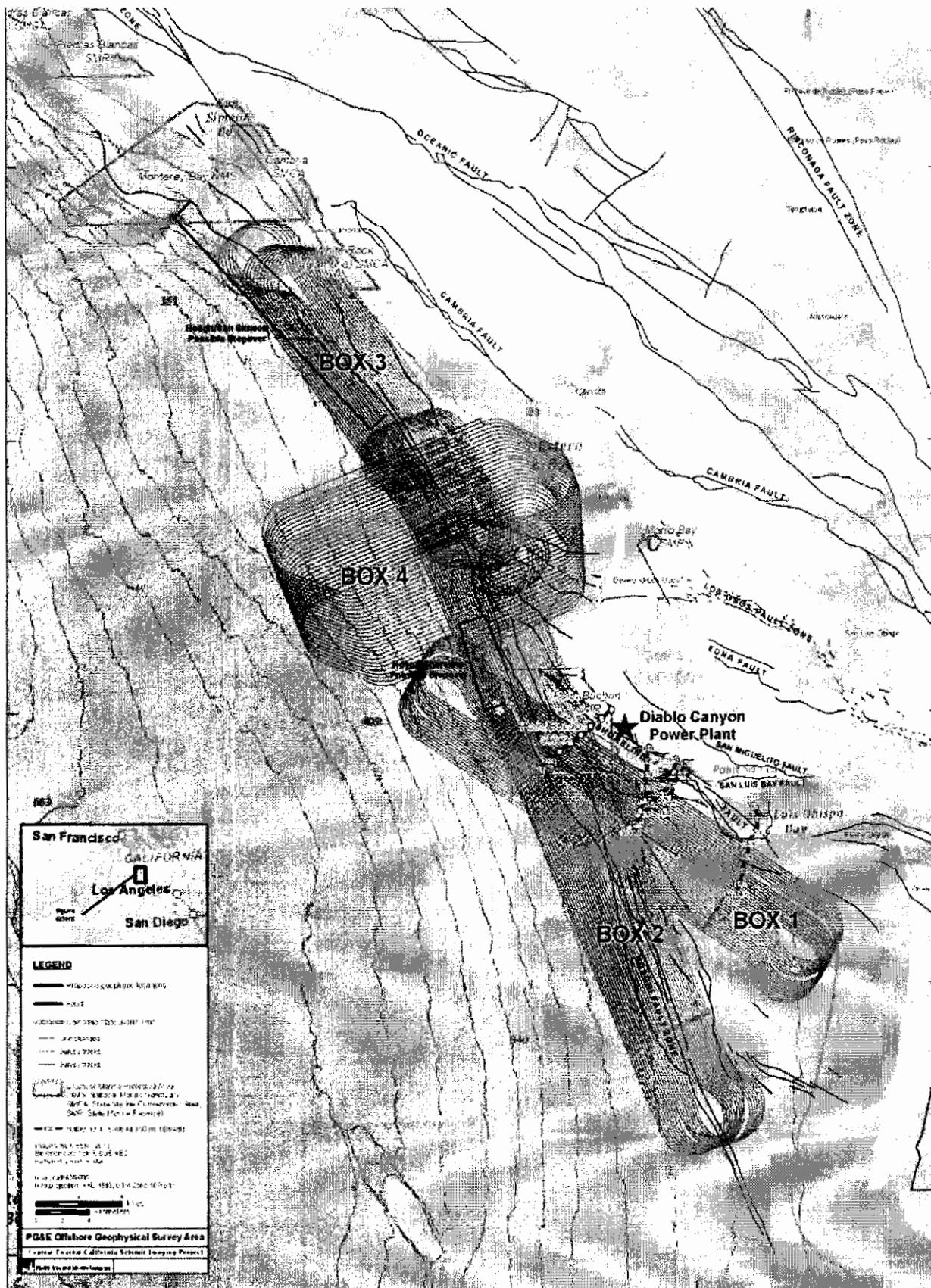
Currently, PG&E is seeking approval from the California Coastal Commission for its revised seismic survey focused on the area referred to as "Box #4" (PG&E had planned to conduct testing this fall in two of the four "boxes" or zones outlined on the project map. Now it only plans to survey Box 4 off the coast of Morro Bay, postponing the testing in Box 2, which ranges from Morro Bay to northern Santa Barbara County).

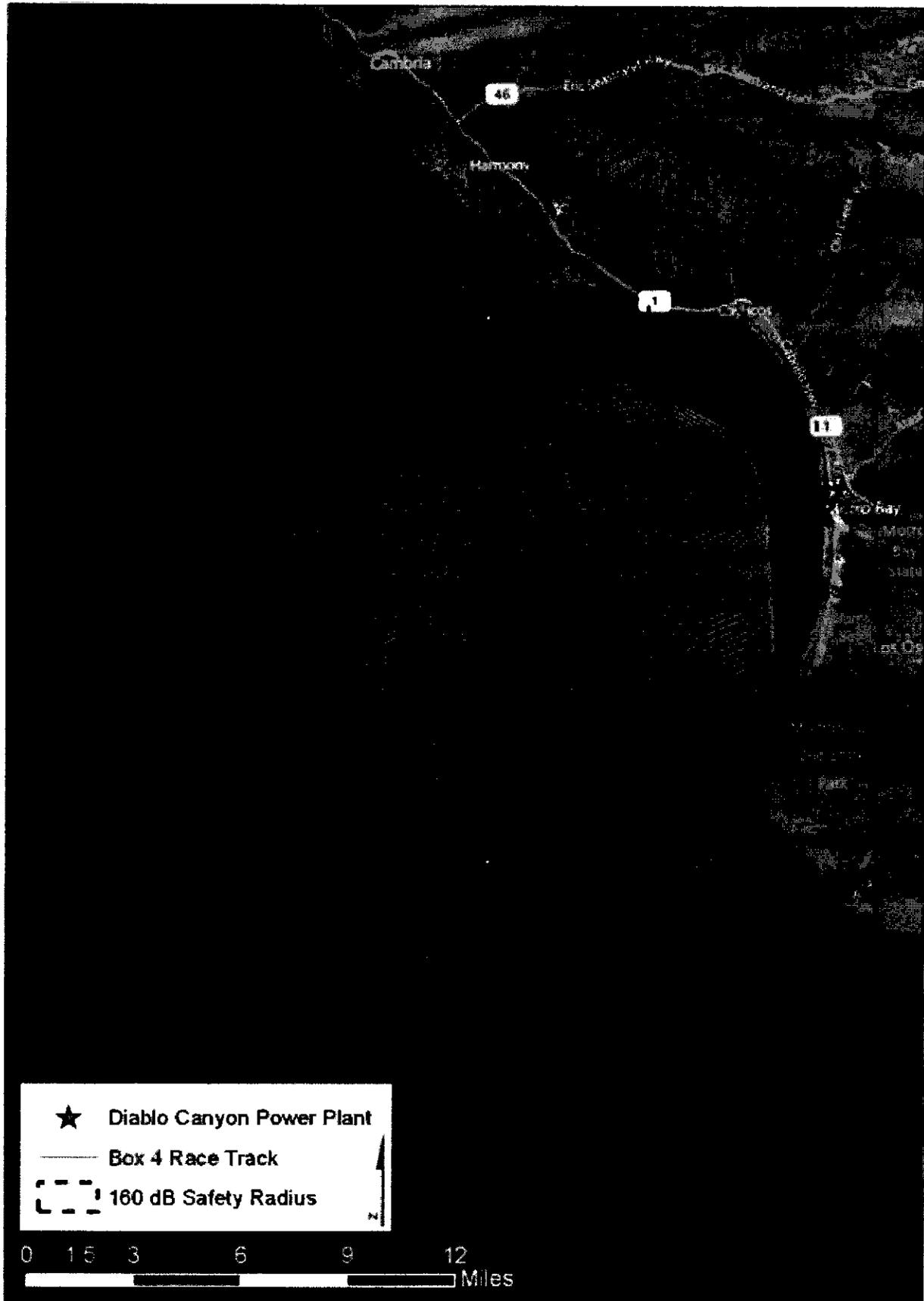
The Commission intends to consider this item at its November 14 meeting in Santa Monica. The utility company had planned to begin seismic testing offshore of Diablo Canyon nuclear power plant in early November, but now it must wait until the conclusion of its mid-November hearing before the Coastal Commission — if the permit application is approved.

PG&E also is seeking a permit from NMFS.

## Seismic Survey Process









**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Region  
501 West Ocean Boulevard, Suite 4200  
Long Beach, California 90802-4213

Holly Smith  
National Science Foundation  
Division of Ocean Sciences  
4201 Wilson Blvd., Room 725  
Arlington, VA 22230

AUG 10 2012

Dear Ms. Smith,

NOAA's National Marine Fisheries Service (NMFS) and National Ocean Service (NOS) appreciate the opportunity to comment on the National Science Foundation (NSF) Draft Environmental Assessment (EA) of Marine Geophysical Surveys by the *R/V Marcus G. Langseth* for the Central California Seismic Imaging Project. The proposed action is to conduct a high energy seismic survey in the vicinity of the Diablo Canyon Power Plant and offshore fault zones.

NOAA understands and appreciates the benefits that could come from improved scientific knowledge of major geologic structures and fault zones in the vicinity of Diablo Canyon. We believe this project and our regulatory review would benefit from a more thorough NEPA analysis and we want to work closely with NSF to help improve the EA to better address potential impacts to living marine resources and marine habitats.

In our future work with you we would like to focus on potential impacts to marine mammals and suggestions for improving the analysis of these impacts and ideas to mitigate potential impacts.

In addition, the EA should be revised to improve the analysis of potential impacts to commercial and recreational fisheries and fishery resources including Essential Fish Habitat. We also suggest including a summary of the Endangered Species Act Section 7 consultation process for all species under NMFS jurisdiction. Lastly, we suggest that additional information should be included to characterize the spatial extent of the seismic survey sound field relative to Monterey Bay National Marine Sanctuary which is located in the northern end of the proposed action area, and the extent of activities that would take place in the sanctuary.

We have attached more specific comments from NOS and NMFS.

Thank you for the opportunity to provide input to NSF on this important project and we look



forward to continuing to work with you. If you have any questions for NMFS please contact Ms. Shelby Mendez at [shelby.l.mendez@noaa.gov](mailto:shelby.l.mendez@noaa.gov) or 562-980-4094, and if you have any questions for NOS and Monterey Bay National Marine Sanctuary please contact Ms. Deirdre Whalen at [deirdre.whalen@noaa.gov](mailto:deirdre.whalen@noaa.gov) or 831-647-4207.

Sincerely,



Rodney R. McInnis  
Southwest Regional Administrator  
National Marine Fisheries Service



for

William J. Douros  
West Coast Regional Director  
Office of National Marine Sanctuaries



October 1, 2012

Charles Lester  
Executive Director  
California Coastal Commission  
45 Fremont Street Suite 2000  
San Francisco, CA 94105-2219

Dear Dr. Lester,

I am writing you today to express the Estuary Program's concern regarding the potential impacts to the marine ecosystem and local fisheries of the Central Coast from the offshore seismic surveys proposed by PG&E and NSF. Noise in the marine environment at the levels projected can have severe short-term impacts on many species and unknown long-term impacts.

Our pristine natural environment along the Central Coast is important to both people and wildlife. The survey will impact a number of marine species, including marine mammals and commercially important fish. Here in the Central Coast, fishermen, community representatives, and conservation groups have been working arm-in-arm to transition the local fishery to one of greater environmental and economic sustainability. In fact, the City of Morro Bay just won the Walter B. Jones Award for Excellence in Local Government (an award under the Coastal Zone Management Act recognizing excellence in coastal management) for their efforts. The seismic survey as currently proposed could undermine the progress the community has made in building a viable, sustainable fishery by harming the natural resources both inside and outside of MPAs that the fishermen depend upon for their livelihood.

I am pleased to see that PG&E is working with the Coastal Commission and conservation groups to amend the project to address concerns, but more work should be done to minimize both environmental and economic impacts from such testing. The Estuary Program hopes that the federal and state agencies reviewing the project take time to weigh the benefits and risks of this testing; assess whether alternative, less-impactful methods are available to determine the potential vulnerabilities to Diablo Canyon Nuclear Power Plant from seismic activity; require safeguards to minimize impacts to the marine environment and local economy; and put in place fair and equitable mitigation measures to help address economic losses to the coastal community and local fishery.

Sincerely,

A handwritten signature in black ink, appearing to read "Adrienne Harris". The signature is fluid and cursive, with a long, sweeping tail that extends to the right.

Adrienne Harris  
Executive Director

cc: Congresswoman Lois Capps; State Senator Sam Blakeslee; Assemblyman Katcho Achadjian



State Of California

ALFRED E. ALQUIST  
SEISMIC SAFETY COMMISSION



Governor Edmund G. Brown Jr.

October 30, 2012

Mary Shallenberger, Chair  
California Coastal Commission Commissioners  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: Alfred E. Alquist Seismic Safety Commission Support for PG&E's Offshore High Energy Seismic Survey

Dear Chair Shallenberger and Commissioners:

I am writing to express the Alfred E. Alquist Seismic Safety Commission's (Commission) support of PG&E's application to conduct a high energy offshore geophysical survey within Box 4 located in Estero Bay near the Diablo Canyon Nuclear Power Plant.

The Commission is a participant in the California Public Utility Commission's Independent Peer Review Panel (IPRP). The IPRP has identified Box 4 as one of three offshore areas that contain known faults and fault intersections of key importance in evaluating seismic risk at Diablo Canyon. High quality 3D geophysical seismic reflection mapping could also identify previously unknown faults that were not identified by older surveys conducted with less advanced technology many years ago.

The Mission of the Commission is to reduce the seismic risk to all Californians. In addition, to being an IPRP member, the Commission was a participant in carrying out the requirements of AB 1632 which called for PG&E to use advanced seismic studies, including high energy 3D surveys. The Commission believes the current proposal to conduct 9.25 days of high energy surveys will demonstrate the capabilities of the survey vessel which is scheduled to conduct similar studies offshore of Diablo Canyon next year, and for the San Onofre Nuclear Generating Station in Southern California. The proposed study will also demonstrate the quality of the data generated and allow review of how those data are interpreted. Beginning the studies in a single area will allow lessons learned to be applied to other areas scheduled to be studied during 2013.

Finally, the proposed project will assist the IPRP in advising the California Public Utilities Commission on how new information may help them make important decisions regarding the Diablo Canyon Nuclear Power Plant.

Again, the Commission respectfully requests that the California Coastal Commission grant a permit to PG&E to conduct these important tests within Box 4 before the end of the current calendar year.

Respectfully,

Mike Gardner  
Chair

CC: Steve Blank  
Dayna Bochco  
Dr. William A. Burke  
Wendy Mitchell  
Jana Zimmer  
Martha McClure  
Steve Kinsey  
Mark W. Stone  
Brian Brennan  
Richard Bloom  
Esther Sanchez  
John Laird or Janelle Beland  
Curtis Fossum or Cy Oggins  
Jay Norvell  
Mark Johnsson  
Cassidy Teufel  
Tom Luster  
Anna Caballero  
Eric Green  
Chris Wills  
Raul DeLaRosa

**CALIFORNIA ENERGY COMMISSION**

ROBERT WEISENMILLER, CHAIR

1516 NINTH STREET, MS 33  
SACRAMENTO, CA 95814-5512  
(916) 654-5036  
FAX (916) 653-9040

October 26, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105**RE: Pacific Gas and Electric Company (PG&E) Three-Dimensional (3-D) Seismic Reflection Mapping near Diablo Canyon**

Dear Chair Shallenberger:

The safety and reliability of Diablo Canyon Power Plant (DCPP) is of critical importance to California and the state's overall electricity supply. The potential vulnerability of DCPP to a major disruption from a major seismic event cannot be ignored. The importance of undertaking a thorough analysis of risks to DCPP reliability is underscored by implications of the current unavailability of the San Onofre Nuclear Generation Station, and uncertainty concerning its return to service.

To help resolve uncertainties surrounding the seismic hazard at Diablo Canyon, the California Energy Commission (Energy Commission), in the 2008 Integrated Energy Policy Report (IEPR) and Assembly Bill (AB) 1632 Report, recommended that PG&E use 3-D geophysical seismic reflection mapping and other advanced techniques to explore fault zones in the vicinity of DCPP.

While the Energy Commission supports PG&E and Southern California Edison in their efforts to implement the seismic hazard recommendation for 3-D seismic mapping, the Energy Commission does not have a discretionary role in reviewing the survey proposal, and will rely on the state's technical review panel and permitting agencies whose responsibility is to assess the adequacy of and act on the merits of the project as proposed.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert B. Weisenmiller".

ROBERT B. WEISENMILLER  
Chair

Ms. Mary Shallenberger

October 26, 2012

Page 2 of 2

cc: Karen Douglas, CEC  
Andrew McAllister, CEC  
Carla Peterman, CEC  
Robert Oglesby, CEC  
Joan Walter, CEC  
Steve Blank, CCC  
Dayna Bochco, CCC  
Dr. William A. Burke, CCC  
Wendy Mitchell, CCC  
Jana Zimmer, CCC  
Martha McClure, CCC  
Steve Kinsey, CCC  
Mark W. Stone, CCC  
Brian Brennan, CCC  
Richard Bloom, CCC  
Esther Sanchez, CCC  
Janelle Beland, DPR  
John Laird, CNRA  
Michael R. Peevey, CPUC  
Michael Picker, Governor's Office  
Cliff Rechtschaffen, Governor's Office

# Independent Peer Review Panel

*A multi-agency panel of seismic hazard specialists  
established by the California Public Utilities Commission*

CALIFORNIA GEOLOGICAL SURVEY, CALIFORNIA COASTAL COMMISSION  
CALIFORNIA EMERGENCY MANAGEMENT AGENCY, CALIFORNIA ENERGY COMMISSION  
CALIFORNIA SEISMIC SAFETY COMMISSION, CALIFORNIA PUBLIC UTILITIES COMMISSION  
COUNTY OF SAN LUIS OBISPO

October 25, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: IPRP support for Offshore High Energy Seismic Survey

Dear Chair Shallenberger:

Thank you for the opportunity to provide expert opinion regarding the Offshore Central Coastal California Seismic Imaging Project proposed by the Pacific Gas and Electric Company (PG&E). In response to the AB1632 report by the California Energy Commission (CEC), the California Public Utilities Commission (CPUC) established the Independent Peer Review Panel (IPRP) to review and provide comments on seismic hazard studies at Diablo Canyon Nuclear Power Plant (DCPP). The comprehensiveness, completeness, and timeliness of these studies will be critical to the CPUC's ability to assess the cost-effectiveness of Diablo Canyon's proposed license renewal. We have reviewed the scope of the seismic surveys, including the proposed off-shore high-energy seismic survey, and commented on their applicability to seismic hazard analysis at DCPP in a series of reports. This letter provides our current evaluation of the proposed high-energy seismic survey.

## **PG&E Seismic Study Plan Progression**

The off-shore high-energy 3-D seismic study plans for DCPP have evolved from the originally proposed scope as presented in PG&E Letter DCL-2012-602 dated February 6, 2012, Figure 1. The original survey consisted of two large trackline boxes as indicated in the above referenced Figure 1. In response to IPRP comments based on maximizing data collection most relevant to seismic hazard assessments, and minimizing environmental impacts the survey was replaced with four smaller trackline boxes detailed in IPRP Report No. 3 dated April 6, 2012, and presented by PG&E in Letter DCL-2012-602 Figure 2. At the June 29, 2012 IPRP meeting PG&E presented an alternative high energy seismic trackline configuration (IIIb) that eliminated the northern-most area (Box 3). This is summarized in IPRP Report No. 4, dated September 25, 2012. The survey scope was again modified in response to the California State Lands Commission (SLC) permitting process, discussions with Coastal Commission staff, and the project extension to a 2-year period in November and December of 2012 and 2013. In the current proposal, the offshore survey for 2012 is a single survey area (Box 4) located in the Los Osos-Hosgri fault intersection region in Estero Bay north of DCPP, shown in PG&E report dated September 28, 2012, (Figure 1-2 page 5). The IPRP reviewed the objectives for the proposed 2012 survey and commented to PG&E, with a request for additional information on Oct. 11, 2012. The IPRP understood the objectives for the 2012 survey to include several geologic targets as well as the potential to refine the proposed 2013 surveys:

- Validation of the survey method as a test for the feasibility to image faults in the deep (5-15 km) Franciscan Complex basement rocks.
- Image the Hosgri, Los Osos, Shoreline and related faults as they converge at depth in a small area offshore of Pt Buchon.
- An opportunity to verify that environmental impacts mitigation strategies are successful.

PG&E's responses to the IPRP's questions in PG&E Letter DCL-2012-653 dated October 17, 2012, clarified the extent of the data collection within the survey box, and show that the surveyed area does cover the primary geologic targets of the survey, which are largely in the southeast quadrant of survey Box 4. The extent of data collection within the proposed survey box was also clarified, along with operational details of the survey.

The near-shore location of the Hosgri fault, 3-4 km from DCPD limits the possibility of conducting high energy seismic surveys oriented perpendicular or along a dip line, hence strike-line surveys are planned for this region in the direct vicinity of DCPD. For the proposed 2012 survey to the north at the Hosgri-Los Osos fault intersection region, a dip line survey is planned. A determination of the Hosgri dip in this region will have seismic hazard implications.

The Morro Strand onshore geophone array is included to provide information about the deeper crustal structure beneath Estero Bay. It is understood that data collected on this array will be of primary value in assessing future onshore deployments in the vicinity of the DCPD.

PG&E's responses to the IPRP's questions also included the information that an Independent Technical Reviewer (ITR) will be assigned by PG&E's Geoscience Department to review the accuracy, completeness and adequacy of the 3D marine seismic reflection data. The independent review of survey planning, acquisition and data processing has been a concern of the IPRP as discussed in IPRP Reports No. 3 and 4. Because of these concerns, the IPRP has discussed hiring additional technical experts who would have a similar charge as the ITR assigned by PG&E. The IPRP notes that the level of independence of the ITR is of paramount importance to the quality of the technical review and public acceptance of survey results.

### **Summary**

The IPRP finds that PG&E has responded to the questions directed to them and has shown that the initial phase of the proposed high energy survey includes an area where important information regarding the geometry and intersections of several faults may be imaged. The IPRP reached consensus that a 3D high energy seismic survey of Box 4 could provide valuable information about the faults that pose the greatest seismic hazard to Diablo Canyon Nuclear Power Plant.

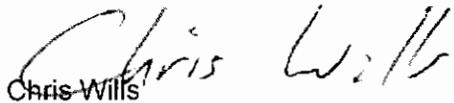
The IPRP did not reach consensus on whether PG&E has demonstrated that the survey currently planned is optimally designed to provide the highest quality data. The IPRP membership, with one exception, support the proposed testing as designed. IPRP member Bruce Gibson (San Luis Obispo County) has expressed general concerns regarding the overall survey planning and data processing approach selected by PG&E, and has not received responses that demonstrate to him that the planned survey is state-of-the-art. In the proposal before the Coastal Commission, Dr. Gibson is specifically concerned that, 1) that data quality over the most important targets (SE quadrant of Box 4) will be low, and 2) the data collected by the shore-based array will not provide an adequate image of the targeted features.

The remainder of the IPRP members acknowledge Dr Gibson's concerns, but believe that the currently planned survey is appropriate to provide preliminary answers to the primary questions

it is designed to answer. The opportunity for additional review of survey design between surveys in 2012 and 2013, whether by an ITR hired by PG&E, or by contracted experts and the IPRP, give the IPRP greater confidence that high energy seismic surveys will yield valuable data to understand the seismic hazards at Diablo Canyon. Dr. Mark Johnsson, representative of the California Coastal Commission on the IPRP, concurs with the opinions expressed in this letter, but takes no position on what the Commission's action regarding the Federal Consistency determination or Coastal Development Permit application should be.

The IPRP hopes that this perspective on the value of this survey for seismic hazard analysis helps the Commission weigh the benefits and impacts of the proposed survey.

Sincerely,

A handwritten signature in black ink that reads "Chris Wills". The signature is written in a cursive, slightly slanted style.

Chris Wills  
Chair, Independent Peer Review Panel



## PUBLIC UTILITIES COMMISSION

STATE OF CALIFORNIA  
505 VAN NESS AVENUE  
SAN FRANCISCO, CALIFORNIA 94102

MICHAEL R. PEEVEY  
PRESIDENT

**RECEIVED**  
OCT 12 2012  
CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

TEL: (415) 703-3703  
FAX: (415) 703-5091

October 12, 2012

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street  
San Francisco, CA 94105

Re: CPUC support for CCC to issue permit to PG&E for DCPD seismic studies

Dear Ms Shallenberger and CCC Commissioners:

I am writing to you today to request the California Coastal Commission (CCC) to expeditiously issue the permit to enable Pacific Gas and Electric Company (PG&E) to perform high energy three-dimensional off-shore seismic surveys for its Diablo Canyon Power Plant (DCPP) as proposed to the CCC. It is important that these surveys be completed on schedule and within the authorized budget. Delaying the schedule proposed by PG&E would result in substantial additional costs. In addition, the fall is the only time of the year where the work can be done with minimum impact to marine mammals and the marine environment.

In accordance with PG&E's application to you for a permit, these seismic surveys are scheduled for November - December 2012. PG&E will be using the R/V Langseth, which is owned by the National Science Foundation and operated by Columbia University, to perform these seismic surveys.

As you know, the CPUC created an Independent Peer Review Panel (IPRP) to provide guidance and review the results of these enhanced seismic studies. The IPRP has reviewed PG&E's survey plans on several occasions. It is very important to the CPUC that PG&E remain on schedule and within budget for performing these off-shore seismic surveys. CPUC Decision D.12-09-008, increasing the authorized spending on enhanced seismic studies to \$64 million, was approved by the CPUC on September 13, 2012.

Immediately following PG&E's scheduled off-shore seismic survey, Southern California Edison is scheduling the same boat R/V Langseth to also perform off-shore surveys during December 2012 for its San Onofre Nuclear Generating Station. The R/V Langseth might not be available to PG&E if the permit from the CCC is delayed until 2013 or later.

In its revised application to the CCC, PG&E proposed the survey to cover one zone, identified as Box 4 in Figure 1-2 of PG&E's application, in off-shore areas north of DCPD in Estero Bay. Seismic surveys of Zones 1 and 2 would be performed by PG&E in 2013, subject to a later application to the

CCC. Performing surveys only in Zone 4 in 2012 would minimize any effects to the marine environment, and is acceptable to our IPRP.

The CPUC strongly encourages and supports the CCC to issue a permit to PG&E now so that the off-shore high energy seismic surveys as proposed by PG&E in Zone 4 can be performed in a timely fashion.

Sincerely,



Michael R. Pcevey  
President

cc: Steve Blank, CCC  
Dayna Bocho, CCC  
William Burke, CCC  
Wendy Mitchell, CCC  
Jana Zimmer, CCC  
Martha McClure, CCC  
Steve Kinsey, CCC  
Mark Stone, CCC  
Brian Brennan, CCC  
Richard Bloom, CCC  
Esther Sanchez, CCC

Catherine Sandoval, CPUC  
Mark Ferron, CPUC  
Michel Florio, CPUC  
Timothy Simon, CPUC  
Paul Clanon, CPUC  
Service List A.10-01-014

OCT 22 2012

CALIFORNIA  
COASTAL COMMISSION

**California Coastal Commission**  
**45 Fremont Street, Suite 2000**  
**San Francisco, CA 94105-2219**

Michael Jean Thibodeaux M.A. Naturalist Marine and Environmental Sciences.  
Adjunct faculty member Cal Poly State University San Luis Obispo, CA.  
[www.mjtthibodeaux@yahoo.com](http://www.mjtthibodeaux@yahoo.com)  
C.O.A.S.T. Alliance member.  
40 year Central Coast of California resident.

**October 18, 2012**

**RE: 3-D Acoustic Seismic Testing on the Central Coast proposed by PG&E**

This letter is to inform the California Coastal Commission of my unimaginable concern over the effects on marine life of the proposed 3-D acoustic testing in the waters around Diablo Canyon nuclear power plant, Avila Beach, and Estero Bay.

The Central Coast of California is home to one of the most diverse and healthy populations of sea mammals in the world. Migrating California gray whales, breeding elephant seals, California sea otters, California sea lions and harbor seals will be severely impacted by the proposed testing. Fish larvae, invertebrates, and rockfish will also be harmed or killed by this testing.

The highly endangered Western Gray Whale, of which there are only about 110 left in the world, migrate through our coastal waters in December and have been left out of all documentation for this proposed project.

The local fishing industry will be severely impacted, along with retail businesses, fish markets, local restaurants and all who serve the thousands of tourists who make up a large part of the local economy.

Data from other 3-D studies using similar technology show that it will take months to years to return a very delicate ecosystem back to normal, if ever.

This type of testing is completely unacceptable. As per AB1632 all existing studies of the area must be thoroughly reviewed. Alternative methods such as low-impact studies, better modeling and technology currently in development MUST be fully explored.

It is the responsibility of your agency to follow the precautionary Principal to do no harm to the marine environment if alternatives are available. Please do not issue a permit for this devastating acoustic technology.

**E-12-005**  
**PG&E SEISMIC SURVEY**

**LOCAL GOVERNMENT / TRIBAL**

**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:00 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: SSCSD Reso - Seismic Permit  
**Attachments:** reso.sesmic.121013.pdf

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**From:** Carl, Dan@Coastal  
**Sent:** Monday, October 22, 2012 11:26 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: SSCSD Reso - Seismic Permit

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**From:** Rob Schultz [<mailto:RSchultz@morro-bay.ca.us>]  
**Sent:** Friday, October 19, 2012 2:08 PM  
**To:** Carl, Dan@Coastal  
**Subject:** SSCSD Reso - Seismic Permit

See attached from SSCSD for the record.

Rob Schultz  
City Attorney  
City of Morro Bay  
595 Harbor Street  
Morro Bay, 93442  
(805) 772-6568 (office)  
(805) 772-6572 ( fax)

\*\*\*\*\*

This message may contain confidential or privileged information. If you received this message in error, please contact the sender and then delete this message from your system.

RESOLUTION NO.12-354

RESOLUTION OF THE BOARD OF DIRECTORS  
OF THE SAN SIMEON COMMUNITY SERVICES DISTRICT  
OPPOSING THE CENTRAL COASTAL CALIFORNIA  
SEISMIC IMAGING PROJECT

**WHEREAS**, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing in and around the waters of Central Coast; and,

**WHEREAS**, the San Simeon Community Services District is concerned with the impacts from the seismic testing; and,

**WHEREAS**, those concerns included the short-term, long-term and permanent effects on fish, fishing, and fish stocks; the short-term, long-term and permanent effects on marine mammals; a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and, the inability for vessels to leave and enter the Morro Bay Harbor; and,

**WHEREAS**, the project has not taken into consideration the land side impacts related to fishing that include, but are not limited to, reduced fish landing and processing activity, fuel docks, fish availability for restaurants, tourism and other environmental issues; and,

**WHEREAS**, the project has not identified an adequate mitigation and claims process for those affected; and,

**WHEREAS**, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

**NOW, THEREFORE, BE IT RESOLVED**, that the San Simeon Community Services District opposes the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

**PASSED AND ADOPTED** by the BOARD OF DIRECTORS of the San Simeon Community Services District at a regular meeting thereof held on the 10th of October 2012, by the following vote:

Upon motion of **Chairperson Ricci**, seconded by **Vice-Chair McAdams**, and on the following roll call vote to wit:

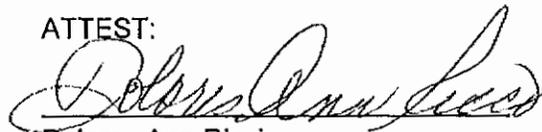
AYES: 3

NOES: 2

ABSTAIN:

ABSENT:

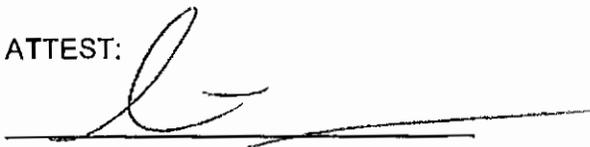
ATTEST:



Dolores Ann Ricci

Chairperson of the Board of Directors

ATTEST:



Charles Grace

General Manager/Secretary SSCSD

# BOARD OF SUPERVISORS

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November 1, 2012

*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

Mary K. Shallenberger, Chair  
Honorable Commissioners  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

**Re: Application No. E-12-005 and CC-027-12  
PG&E High Energy Geophysical Survey  
(Wednesday, November 14<sup>th</sup>, Item 13.b.)**

Dear Chair Shallenberger and Members of the Commission:

The San Luis Obispo County Board of Supervisors appreciates the opportunity to provide comment on the above-referenced application for a high-energy offshore seismic reflection survey, proposed to be conducted near the Diablo Canyon Power Plant (DCPP). Our Board has been actively involved for some time with efforts to better understand the earthquake seismic hazard at DCPP.

Our Board again considered this matter at our October 30, 2012 meeting. After reviewing our previous recommendations and hearing over four hours of public testimony, we are of the unanimous opinion that that your Commission should not approve the application for the project as currently proposed, for reasons noted below.

Your Commission is already in receipt of our Board's letter to the State Lands Commission (dated August 7, 2012, transmitted to you on September 17, 2012). The relevant paragraph of that letter reads:

*"Our Board believes that the State Lands Commission (CSLC) should only issue a permit for the Diablo Canyon HESS if the following conditions are met: 1) all environmental impacts are fully understood and mitigated to the maximum degree possible, understanding that mitigation to a level of insignificance may not be possible; 2) all unavoidable economic impacts are fully and fairly compensated; and 3) the technical details of the survey design have been subjected to independent third-party review by industry-qualified experts to confirm that the best available technology is applied to this crucial investigation."*

Our opposition to the proposal before you (a subset of the project submitted to CSLC) is based primarily on the fact that none of the three conditions listed have been realized.

Mary K. Shallenberger, Chair  
Re: Application No. E-12-005 and CC-027-12  
November 1, 2012

First, the environmental impacts of the proposed survey are not yet completely understood and therefore cannot be mitigated to the greatest extent feasible. There is broad concern about the effect that high levels of underwater noise may have on divers, swimmers, surfers, and other humans who may be in the ocean when the proposed testing takes place. If it proves necessary to close areas of the ocean to these activities then a closure protocol must be developed and mitigation for the lost recreational resource must be addressed. The Board also believes there should be further substantiation of the expected impacts to marine life.

Second, PG&E has not yet arrived at an adequate and comprehensive program to mitigate and compensate for the significant economic impact of the survey on ocean-dependent commercial interests, including commercial fishing, recreational fishing, other recreational activities (e.g., diving) and associated shore-based enterprises.

Third, the current survey design, which proposes using the vessel *R/V Langseth* towing four streamers, does not likely represent the state-of-the-art in 3-D high-energy data collection. For instance, a different vessel towing more streamers would create a wider survey footprint thereby reducing data acquisition time and its associated impacts. The technical details of the survey design should be subjected to an independent third party review by qualified industry experts to confirm that the best available technology is being applied. We expect no less than a demonstration that any high-energy offshore survey would provide the best possible scientific result with the least environmental impacts.

Our Board is driven by the fundamental concern that the earthquake hazard to the Diablo Canyon Power Plant be understood as thoroughly and objectively as possible. We acknowledge that a three-dimensional high-energy survey could provide information essential to a full understanding of the potential hazards off-shore of DCP. Given the significant environmental impacts, any such survey must be designed and executed to meet the highest standards.

As part of a proper design approach to this project, we believe that PG&E should first complete processing and interpretation of low-energy offshore data recently collected, as well as the substantial data sets collected onshore. Information from these related studies would provide important guidance in optimizing high-energy offshore data collection and processing parameters, consistent with modern survey design practice.

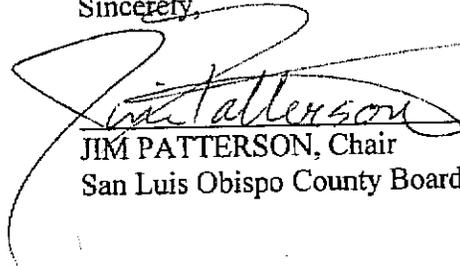
While PG&E has characterized their current proposal as a sort of pilot project, the stated project objectives are those of accomplishing a piece of the overall high-energy offshore survey previously proposed. It is not clear how the technical adequacy of this survey would be assessed, nor how any subsequent survey parameters might be optimized based on these results. Our position remains that independent review is necessary before any high-energy work is conducted offshore.

Mary K. Shallenberger, Chair  
Re: Application No. E-12-005 and CC-027-12  
November 1, 2012

In conclusion, our Board urges your Commission to deny the current application. PG&E's current proposal fails to describe and mitigate environmental impacts to the greatest degree possible, it lacks an adequate and comprehensive program to mitigate and compensate for economic impacts, and it lacks an independent third-party review of survey design to guarantee a state-of-the art seismic study.

Thank you for your consideration.

Sincerely,



JIM PATTERSON, Chair  
San Luis Obispo County Board of Supervisors

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# BOARD OF SUPERVISORS

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*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

September 17, 2012

Mr. Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and  
Federal Consistency Division  
45 Fremont St., Suite 2000  
San Francisco, Ca 94105

RE: Central Coastal California Seismic Imaging Project (CCCSIP), San Luis Obispo County

Dear Mr. Teufel:

I am writing to communicate the SLO County Board of Supervisors' position regarding the Central Coastal California Seismic Imaging Project (CCCSIP) remains as expressed in a letter sent to the State Lands Commission, dated August 7, 2012 (attached for your reference).

Residents of San Luis Obispo County have an obvious interest in being assured of the safe operation of the Diablo Canyon Power Plant. Thus, our Board believes it fundamentally important that advanced seismic reflection surveys be employed as part of a thorough examination of the earthquake risk to this facility.

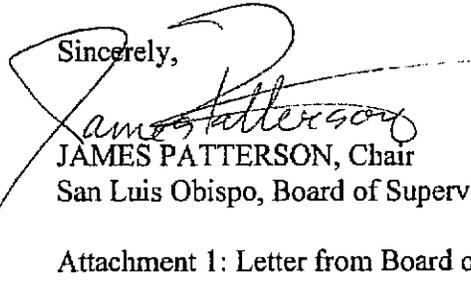
Our Board expects that such surveys would take every effort to avoid environmental impacts and mitigate unavoidable impacts to the greatest extent possible. Similarly, economic impacts to ocean-dependent businesses should be minimized and fully compensated.

The attached letter details the Board's further concern that independent third-party review of the proposed survey by industry-qualified experts is required to assure both the highest quality survey result and the lowest level of impact. While the basis for the necessary review is fairly technical (and included in the attached letter), my colleague, Supervisor Bruce Gibson, can provide further information, if you desire. Dr. Gibson has participated in the technical review of this project as part of the Independent Peer Review Panel established by the California Public Utilities Commission.

September 25, 2012  
CCCSIP, California Coastal Commission

We appreciate your Commission's careful review and consideration of this important project.  
Thank you.

Sincerely,



JAMES PATTERSON, Chair  
San Luis Obispo, Board of Supervisors

Attachment 1: Letter from Board of Supervisors to California State Lands Commission, 8/7/2012

# BOARD OF SUPERVISORS

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*FRANK R. MECHAM, Supervisor District One*  
*BRUCE GIBSON, Supervisor District Two*  
*ADAM HILL, Supervisor District Three*  
*PAUL TEIXEIRA, Supervisor District Four*  
*JAMES R. PATTERSON, Supervisor District Five*

August 7, 2012

State Controller John Chiang, Chair  
California State Lands Commission  
100 Howe Ave. Suite 100  
South Sacramento, CA 95825-8202

RE: Permit for a 3-D high-energy offshore seismic reflection survey,  
Central Coastal California Seismic Imaging Project (CCCSIP) near Diablo Canyon  
Power Plant, to be heard August 14, 2012

Dear Mr. Chiang:

The San Luis Obispo County Board of Supervisors appreciates the opportunity to comment on the high-energy offshore seismic survey referenced above, proposed by PG&E as part of a comprehensive evaluation of potential seismic hazards near the Diablo Canyon Power Plant.

In summary, our comments are these:

- Our Board endorses the execution a 3-D high-energy seismic survey (HESS) in the area generally outlined in PG&E's proposal, subject to conditions discussed below.
- We acknowledge that 3-D HESS at the scale necessary for this investigation will have significant environmental impacts that cannot be fully mitigated. We believe that, if the survey is properly designed and executed, the public benefit of enhanced knowledge of seismic hazards supports approval of such a survey, under the requirements of the California Environmental Quality Act (CEQA).
- We also acknowledge that the necessary survey will have significant economic impacts on ocean-dependent interests in this county, including commercial fishing, recreational fishing, other recreational activities (e.g., diving), and associated shore-based enterprises. The survey should be designed and executed to minimize these economic impacts. The unavoidable economic impacts should be fully and fairly compensated, based on an

independent assessment of those impacts that is confirmed with long term monitoring of catch rates.

- We are concerned that unresolved issues remain regarding the design of the proposed survey, specifically as to whether this proposal is consistent with industry state-of-the-art seismic reflection survey techniques (see discussion below and Attachments). The use of currently available industry technology could potentially reduce environmental impacts and improve the seismic image of important geologic targets.

Our Board believes that the State Lands Commission (CSLC) should only issue a permit for the Diablo Canyon HESS if the following conditions are met: 1) all environmental impacts are fully understood and mitigated to the maximum degree possible, understanding that mitigation to a level of insignificance may not be possible; 2) all unavoidable economic impacts are fully and fairly compensated; and 3) the technical details of the survey design have been subjected to independent third-party review by industry-qualified experts to confirm that the best available technology is applied to this crucial investigation.

## DISCUSSION

*Necessity of 3-D HESS.* The threat of seismic hazards to the Diablo Canyon Power Plant (DCPP) has long concerned the County and its residents, other public and regulatory agencies and PG&E. The most recent efforts to characterize seismic threats are driven by the requirements of Assembly Bill 1632 (Blakeslee, 2006), the discovery of the Shoreline fault immediately adjacent to DCPP (2008), and the tragic consequences of the Fukushima earthquake in 2011. The unexpectedly large earthquake at Fukushima, in particular, dictates that PG&E and all relevant public and regulatory agencies meticulously re-examine every aspect of seismic hazard analysis and gather further information to expand and solidify our understanding of the seismic threat to DCPP.

High-resolution 3-D seismic reflection surveys are essential to reveal the details of geologic structures that relate directly to earthquake potential. Such surveys produce detailed images of fault location, size, connectivity and sense of movement; these are fundamental parameters in the analysis of potential earthquake magnitude. The importance of 3-D seismic reflection mapping was emphasized by the California Energy Commission in their 2008 assessment of seismic vulnerability at DCPP.

The geologic targets to be examined by the proposed survey have been reviewed by the Diablo Canyon Independent Peer Review Panel (IPRP, created by the California Public Utilities Commission). As stated in formal comments to CSLC, the IPRP found that “1) the proposed survey generally covers the appropriate geologic targets, although we believe one area of the survey can be eliminated without compromising the seismic hazard analysis, and 2) that minor adjustments to the survey track orientation and extent in certain areas would be prudent to assure the best coverage of certain targets.”

Our Board concludes that the large scale of the proposed survey is necessary, acknowledging that some reduction may be possible, per the comment above.

*Environmental impacts.* CEQA obviously provides the appropriate framework for analysis of environmental impacts. We understand that CSLC staff has received numerous comments on the Draft Environmental Impact Report (DEIR) prepared for this project. In preparing the Final EIR (FEIR), and considering its certification, our Board urges the CSLC to be certain that, a) all relevant impacts have been identified, b) an appropriate range of alternative projects has been analyzed, and c) that the most extensive level of feasible mitigation has been applied, and follows with long term monitoring especially to impacts that are deemed significant and unavoidable (Class I).

As discussed below, issues of detailed survey design remain unresolved: the capability of the survey vessel directly relates to the time required for data acquisition and thus has bearing on the degree of impact to marine biological resources. Full examination of this issue may appropriately require the formal analysis of another alternative project.

*Economic impacts.* The FEIR identifies significant and unavoidable impacts to commercial fishing and recreational interests (Section 4.13) due to the preclusion of fishing during survey operations and damage to fish stocks. Environmental impact mitigations are centered on seasonal timing of the survey and communication with affected parties. While the FIER contains discussion of the value of fish landings, the unavoidable economic losses to these parties will also be significant and compensation for these impacts is not considered.

Our Board believes that this survey should not be permitted until full and fair compensation for expected economic losses to fishing and recreational enterprises (including those based on shore, such as processors and distributors of local seafood) has been established. Guidance for this effort might be provided by previous trans-oceanic cable laying projects, which had impacts due to the preclusion of fishing. Compensation for fishing losses should be based on an independent assessment of those impacts, that is confirmed with long term monitoring of catch rates.

*Seismic data acquisition, processing and interpretation specifications.* In the IPRP's technical review of the proposed survey, SLO County's representative (Supervisor Bruce Gibson) has raised questions and requested public discussion regarding the specifics of data acquisition, processing and interpretation within the survey footprint. These issues are discussed at length in a letter from Sup. Gibson to PG&E (dated June 20, 2012, Attachment 1) and PG&E's response (dated July 13, 2012, Attachment 2).

While PG&E has provided considerable detail on a wide variety of issues, unresolved issues remain as to whether the proposed survey is consistent with the seismic exploration industry state of the art (see Attachment 3). As noted below, the appropriate resolution of these issues would be independent peer review by qualified industry experts, having expertise beyond that of the IPRP membership.

One of these issues is relatively easy to describe. The proposed survey vessel would tow 4 laterally-separated streamers of hydrophones, covering a swath of 300-400 m of ocean surface with each pass of the survey vessel. In contrast, industry vessels can tow 10 or more streamers similarly spaced, resulting in a swath about 1000 m wide. As noted in PG&E's response (Attachment 2), the greater number of streamers "can reduce data collection time by a factor of 2 or 3."

PG&E contends, but has not demonstrated, that operation of a 10-streamer boat is not feasible in this survey area. The question should be settled by an industrial-level survey design review, which would model data acquisition geometry based on state-of-the-art streamer positioning technology. While the issue of data collection efficiency is certainly important because reduced survey time would reduce impacts to marine life, the larger streamer numbers and other industrial survey technologies could also improve the image quality of geologic targets.

## CONCLUSION

Our Board believes that the high-energy 3-D offshore survey of geologic structures near Diablo Canyon Power Plant should be designed with the greatest care and conducted with industry state-of-the-art technology. The residents of San Luis Obispo County deserve to know that every effort has been made to design and execute a survey that provides the highest-quality image of the potential geologic hazards in this area. Given the significant environmental and economic impacts, we realistically have only one opportunity to do a survey of this magnitude -- this survey must be done right.

In conclusion, we believe the information to be gained from this survey is crucial to public safety. We urge the State Lands Commission to issue permits for it only if the environmental and economic impacts have been properly addressed and the proposed survey design meets the highest scientific and technical standards.

Thank you for your consideration,

Sincerely,



JAMES PATTERSON, Chair  
San Luis Obispo, Board of Supervisors

Attachment 1 Letter from Supervisor Gibson to PG&E, June 20, 2012

Attachment 2 Letter from PG&E to Supervisor Gibson July 13, 2012

Attachment 3 Summary of Unresolved Technical Issues

## BOARD OF SUPERVISORS

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BRUCE GIBSON  
SUPERVISOR DISTRICT TWO

June 20, 2012

Mr. L. Jearl Strickland  
Director, Nuclear Projects  
Diablo Canyon Power Plant  
PO Box 56  
Avila Beach, CA 93424

RE: Central Coastal California Seismic Imaging Project (CCCSIP) -- High-energy 3D seismic reflection survey near Diablo Canyon Power Plant (DCPP)

Dear Mr. Strickland:

The Independent Peer Review Panel (IPRP, convened by the California Public Utilities Commission under Decision 10-08-003, 2010) has met several times and has commented on the design of the 3-D seismic survey referenced above. The IPRP has commented that, with certain adjustments, the overall survey coverage of geologic targets relevant to the seismic hazard analysis appears adequate. The IPRP, however, has also suggested more detailed review of the seismic acquisition and processing techniques proposed to be used within the overall survey footprint.

With this letter, I am requesting that PG&E provide public responses regarding the data acquisition and processing issues described below. Please note that I am writing here as an elected official representing the residents of San Luis Obispo County (and not officially on behalf of the IPRP). The basis for these questions is my previous experience as a seismic exploration research geophysicist (CV attached) and consultation with current experts in seismic acquisition and data processing.

Discussion of these issues is warranted because PG&E has proposed to use a survey vessel owned by the National Science Foundation and operated by Lamont-Doherty Earth Observatory of Columbia University (LDEO). While LDEO is an outstanding research institution, the seismic imaging capabilities of the academic world have historically lagged those available from seismic exploration contractors ("the industry"). This difference is attributable to superior acquisition technology, enhanced data processing techniques, and a comprehensive integration of acquisition and processing decisions.

The fundamental question then is whether PG&E's proposed survey is consistent with state-of-the-art seismic reflection imaging practice. As noted below, the proposed survey vessel has less acquisition capability than most industrial vessels, and since no data processing approach has been specified, no acquisition/processing coordination has been detailed. Given the importance of the seismic hazard analysis of the area surrounding DCPP, PG&E should publically explain why industrial-level current technology has not been proposed for these studies.

Sections below include a summary comparison of PG&E's proposed survey with the current industrial state-of-the-art. Sections following that contain expanded discussions of the relevant technical issues of 3-D seismic reflection practice.

### **PG&E's proposed survey**

The following summary specifications of PG&E's proposed survey are taken from the Project Description section of the Draft Environmental Impact Report prepared for the California State Lands Commission:

- One survey vessel towing 4 hydrophone streamers of 6 km length each, with a cross-line separation of 100 to 150 m.
- Two air-gun source sub-arrays towed by the survey vessel, fired alternately, cross-line separation 75 m.
- Offshore survey conducted over four defined areas. Within each area, air-gun shots taken along parallel track lines. Compass heading of track lines is constant in each area, resulting in a narrow range of source-receiver azimuths.
- Shallow water, near-shore (transition zone) data acquired by 5 lines of cabled geophones placed on the seafloor. Seismic sources located offshore (air-gun shots from the offshore survey) and onshore (vibrator trucks).

PG&E has indicated that design of the offshore and transition zone surveys was tested in an "illumination study" based on 2D and 3D ray-tracing calculations. No specific data processing for the acquired data or specific interpretation products have been specified.

### **Current industrial survey practice**

The current industrial state-of-the-art for complex geologic areas with deep imaging targets is as follows:

- One survey vessel towing 10 or more streamers of 7 to 8 km in length, with cross-line separations of 75 to 125 m.
- One air-gun source array located on the streamer boat and at least one additional and identical source array on a source-only boat. The two or more sources fire alternately (or sequentially, if more than 2). The purpose of the additional source(s) is to provide a wider source-receiver azimuth range to the recorded wavefield.
- Adjacent traverses of the seismic vessel through the survey area are offset laterally such that there is a partial overlap of the streamer spreads. This provides a finer cross-line spatial sampling of the reflected wavefield.
- Major steps in current 2D and 3D data processing include: data conditioning (ambient noise attenuation, estimation and equalization of source wavelets from one shot to the next), 3D surface related multiple elimination (SRME), several passes of migration/tomography (velocity) analysis to determine subsurface velocities, 3D pre-stack reverse time migration (RTM) and post-image signal enhancements.
- Transition zone surveys include seafloor hydrophones, as well as geophones. Extensive data processing is especially directed at static timing corrections, source wavelet equalization and suppression of water column reverberations.
- In designing both offshore and transition zone surveys, iterative finite-difference wave equation modeling of expected targets is used to develop acquisition parameters (source-receiver type, spacing and location) and integrated data processing techniques.

- Required interpretation products are considered during survey design, and usually include time and depth maps of key reflectors, maps of faults with discernible travel time offset, horizon-based and volumetric attributes, several of which assist in small fault detection.
- Interpretation products also include interval velocity maps (including azimuthal variations) for the characterization of azimuthal velocity anisotropy and the horizontal stress field.

Attachment 1 includes an expanded discussion of these technical issues, beginning with a description of the process of modern survey design.

#### Summary request for response

Comparison of the information summarized above clearly shows areas where PG&E's proposed survey design and execution is not consistent with current industry standards. Assurance of the quality of seismic images produced by the offshore and transition zone surveys is foundational to understanding the seismo-tectonic setting and the quantitative analysis of seismic hazard.

Given long-standing concerns regarding the seismic threat posed by the geologic setting near Diablo Canyon – concerns heightened by the Fukushima disaster – the public deserves to know that the best possible seismic survey technology is applied to the studies that PG&E is undertaking. Taking care to document now that data are to be acquired and processed at the highest standards is fundamentally important to the future interpretation of the results.

For these reasons, I request that PG&E provide justification for their proposed choice of survey parameters and approach, given the current industrial standards summarized above. I ask that, at a minimum, PG&E provide a thorough discussion of the specific issues listed below:

- The overall design approach for both the offshore and transition zone surveys should be described. The survey design discussion should explain how survey acquisition parameters, data processing sequence, and interpretation products were chosen and how these three elements are integrated.
- The offshore and transition zone survey design process should analyze results of recently-conducted land surveys to confirm the adequacy of acquisition parameters and processing flow.
- The choice of basic parameters such as spatial sampling interval and maximum source-receiver offset should be discussed relative to the spatial resolution required to image expected target structures at depth. For instance, what spatial resolution is required to evaluate geologic markers that might provide a measure of fault slip rate?
- The choice of towing only 4 streamers in the offshore survey should be evaluated. Typical industrial surveys deploy 10 or more streamers to improve survey efficiency (i.e., reduced acquisition time). This should be a significant issue for the proposed survey, which has been analyzed to have significant impacts to marine life, based on time exposure to the seismic source.
- The potential benefit of data acquisition over a wide (in contrast to the proposed narrow) source-receiver azimuth range should be evaluated for both image quality improvement and the ability to evaluate the orientation of maximum horizontal stress.
- The proposed seismic data processing flow, data processing contractor and experience should be specified.
- The potential benefit of evaluating vertical fracture alignment, maximum horizontal stress, and directional stress inequality should be discussed. While this information is not typically used in traditional seismic hazard analysis, it does relate to the physical state of the overall seismo-tectonic setting.

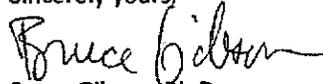
- The specific acquisition parameters and processing sequence of the transition zone survey should be discussed. Of particular importance would be the processing proposed to assure a high-quality seismic image after merging the transition zone data with the onshore and offshore survey data.

#### Conclusion

I appreciate the effort required to design and execute a high-quality seismic survey of the geologic setting surrounding this important facility, and I thank you in advance for your responsiveness to this request. I believe it vitally important that the public is assured that we are all making best efforts to develop a more robust understanding of risks to the safety of the Diablo Canyon power plant, a critical feature of our county's environmental and economic landscape.

If I can answer any questions or provide any further information, please don't hesitate to contact me. Thank you.

Sincerely yours,



Bruce Gibson, Ph.D.

Attachment 1. Discussion of survey design, acquisition, processing and interpretation

Attachment 2. B. Gibson's curriculum vitae

#### Distribution

Stuart Nishenko, PG&E

Tom Jones, PG&E

Eric Greene, CPUC

Sup. Adam Hill, SLO County

Jennifer DeLeon, State Lands Commission

Cy R. Oggins, State Lands Commission

**ATTACHMENT 1**  
**DISCUSSION OF SURVEY DESIGN, ACQUISITION, PROCESSING AND INTERPRETATION**  
**June 20, 2012**

**Seismic survey design**

The design of a modern industrial seismic survey begins with the question "What are the imaging goals of the survey?" The answer to that question involves specification of parameters such as imaging target depth and the desired vertical and horizontal resolution. The main objective of the seismic imaging project, as stated in IPRP Report No. 3 (dated April 6, 2012), is to "explore fault zones in the vicinity of the DCP, especially the intersection between the Hosgri and Shoreline faults." Targets to be imaged might range in depth from the seafloor (top of the sedimentary section) to as deep as 15 km (maximum seismogenic depth). In general, a seismic survey of targets over this depth range will require long source-receiver offsets, densely spaced sources and receivers, and small common midpoint (CMP) bins.

Once these basic parameters are set, the next question is "Given the survey goals and desired parameters, our knowledge of the geology of the area, and all environmental issues, what data acquisition and processing specifications are sufficient to meet the goals in an environmentally sound and economical fashion?" Consideration of the geology is important because the complexity of an area has a large impact on the detailed design of the survey. Challenges such as those related to large subsurface dips, velocity-field complexity and high acoustic attenuation zones must be recognized and planned for. Environmental considerations encompass many aspects, including: weather, ocean currents, obstructions to navigation, shipping lanes, ambient noise, and the regional fauna and flora that could be affected by the survey activity.

As discussed below, the specifics of data acquisition parameters are typically determined by iterative modeling of the expected seismic response of the survey targets for a variety of source and receiver combinations. The modeled seismic response is then processed to confirm both the survey acquisition geometry and the necessary data processing flow. This integration of acquisition and processing, which has not been discussed by PG&E, is fundamental to modern reflection survey design to assure the expected effectiveness of the survey, as constrained by the environmental factors listed above.

The current industry state-of-the-art for survey design is to create synthetic acoustic seismic data using finite-difference wave-equation calculations for a specific geology and a range of acquisition parameters. Each model data set is then processed using appropriate techniques such as 3D surface related multiple elimination (SRME) and 3D reverse time migration (RTM). This allows the best of the acquisition designs to be selected based on the evaluation of the final image. If details of the geology are unknown, an informed guess can be used. For example, a survey designer can pose and answer a question such as "If a high-dip fault existed in this area, could it be imaged using this acquisition and processing scheme?"

In the complete design of a survey, the interpretation goals, methods, and products should be specified as well. At the minimum, the interpretation output would include: time and depth maps of all key reflectors, showing faults with discernible offset in time or depth; horizon-based and volumetric attributes for subtle fault detection, and interval velocity maps between key reflectors (including information on the azimuthal variation of interval velocity). The azimuthal interval velocity maps (co-rendering of the local fast, slow and azimuth of fast interval velocity) can be used to discern the azimuth of local maximum horizontal stress and the inequality of the horizontal stresses.

### **Marine acquisition parameters**

*Spatial sampling.* In typical marine surveys, the spatial sampling is most dense along the streamer direction and thus most survey tracks are generally oriented in the targets' dip direction. In the CCCSIP, shooting tracks (which in some areas parallel the fault's strike) should be carefully assessed for the ability for direct fault imaging. However, shooting parallel to fault strike will enhance the spatial resolution of information that may be helpful in estimating past slip movement. The tradeoffs presented by shooting direction can be assessed with survey design modeling, described above.

*Maximum source-receiver offset.* From a pure imaging standpoint, longer offsets allow imaging of deeper structure. A 6-km maximum offset provides acceptable imaging down to a depth below sea level (BSL) of about 6 km. From an interpretation standpoint, longer offsets provide valuable amplitude versus offset (AVO) information for inversion of rock properties.

*Number of towed streamers.* Typical industrial survey vessels tow 10 or more streamers with nominal cross-line separations of 100 m. In general, a greater number of streamers towed reduces the number of required shooting passes. This improved data acquisition efficiency results in economic -- and potentially environmental -- benefits. An additional important advantage is that a wider streamer spread samples more of the reflected wavefield, which can enhance image quality relative to narrow-spread streamers.

While more streamers are potentially better, survey design decisions involving the number of streamers must consider both the capability of the survey vessel (streamer storage and handling capacity, towing horsepower) and environmental constraints (ocean currents and obstructions).

*Position accuracy.* Position accuracy of the source and receivers directly affects the overall fidelity of the seismic image. For example, in marine surveys, accurate source and receiver depths lead to consistent and better deghosting from one trace to the next. In the land case, vertical accuracy is required for application of elevation statics. Lateral accuracy is related to the fidelity of both data conditioning (interpolation and 3D SRME in particular) and imaging processing steps. These algorithms depend on knowledge of the locations of the source and receivers; if those data are poor quality, then the algorithm results will be likewise. The end result of poor positioning accuracy is a decrease in the resolution of the final image. Typical vertical and lateral accuracy are about  $\pm 0.5$  m and  $\pm 3$  m or better, respectively. For wide-azimuth surveys the cable steering is generally used to keep the streamers parallel to one another. Active steering fins on streamer cables can change the cable feathering by as much as  $\pm 4^\circ$ . Knowledge of expected ocean currents is important to assessing streamer positioning accuracy.

### **Wide-azimuth seismic reflection surveys -- acquisition and processing**

For areas with complex geology, wide-azimuth data can contribute significantly to better quality of the subsurface image<sup>1</sup>. Additionally, wide-azimuth data analysis has become commonplace in mapping the in-situ horizontal stress field (azimuth of local maximum horizontal stress, and inequality of the horizontal stresses), and the dominant vertical aligned fracture set (its azimuth and relative fracture density)<sup>2</sup>. Differences in the horizontal stress field in and around the known (and unknown) faults may prove valuable to the tectono-physicists in understanding potential fault ruptures.

Marine wide-azimuth seismic acquisition was originally developed to improve the imaging of reflecting horizons lying below complex structures such as salt domes. The method is also valuable, however, for any regime that includes high dips and significant structure in the cross-line direction. For the geologic situations just mentioned, a narrow-azimuth seismic survey can produce sub-optimal imaging results. The

basic problem is that with complex geology the subsurface can scatter the incident wavefield in all directions. If the orientation of an acquisition program favors only a specific source-receiver orientation (narrow-azimuth), then it is likely that portions of the scattered wavefield are not recorded. As a result, those portions of the scattered wavefield cannot contribute their information to the final seismic image, thereby creating zones in which the image is misleading or even entirely missing<sup>3</sup>.

The acquisition of wide-azimuth marine data generally requires more than one shooting boat, although creative vessel navigation has been used to accomplish similar results<sup>4</sup>. The lateral offset of a second source boat (offset typically 1 – 2 km cross-line to the receiver array) is the most efficient means of widening the range of source-receiver azimuth. Since image quality is sensitive to source timing and location, sophisticated control systems are required to coordinate shot initiation and positioning of multiple vessels.

Among the first data processing issues of marine surveys, suppression of multiple reflections is particularly important. State-of-the-art processing includes a 3D SRME algorithm that is capable of predicting multiples for data that are irregularly sampled (because of cable feathering, for example). Failure to suppress multiples causes artifacts to appear in migrated images. Such artifacts can obscure primary reflections or might even be misinterpreted as primary reflections. Successful multiple suppression requires significant computing resources and experienced technical staff.

Processing software must also account for and estimate the azimuthal variation in travel times (velocity). Not only can this information be used in interpretation, it is essential to include the azimuthal variations in velocity to obtain the best image possible. Otherwise, the stacked image after pre-stack migration will lose bandwidth due to improper event alignment.

Data processing that reveals the azimuthal variation in the AVO (amplitude variation with offset) is the state-of-the-art for vertical aligned fracture detection and characterization. Azimuthal variations in interval velocities, after pre-stack time migration that preserves azimuth and offset, are used to characterize the in-situ horizontal stress field.

#### **Transition zone surveys – acquisition and processing**

Seismic surveys in areas covered by shallow water (transition zones) are particularly challenging because the physical characteristics of each transition zone are unique. Transition zone survey design must consider water depth, wave action, tides, water bottom characteristics, type of onshore terrain, and other factors. In general, the survey designer tries to create a well-sampled distribution of receivers and shots that will provide a data set that can be processed successfully using standard algorithms.

Most transition zone surveys include deployment of water-bottom and onshore recording sensors with air-gun arrays for offshore shots and vibrators for onshore shots. A dual-sensor (hydrophone/vertical component geophone) is the minimum industry standard for ocean-bottom recording in transition zones. Vertical geophones are particularly valuable for helping to eliminate water-column reverberations during processing. Four-component (3 components of geophone and one hydrophone) sensors are used when shear-wave information is acquired.<sup>2</sup> Four-component recording is indicated when knowledge of the in-situ stress field and vertical aligned fractures is desired. The P-S (mode-converted shear wave reflections) data are sensitive to the presence of unequal horizontal stresses and vertical aligned fractures; these P-S data can be compared to the azimuthal P-P reflections to learn of lithology, porosity, pore fill, stress state, and fractures.

A key challenge in processing transition zone data is that the individual portions of the survey have to be matched for the various combinations of sources and receivers. For a standard dual sensor, there are four

data subsets: air gun/hydrophone, air gun/geophone, vibrator/hydrophone, and vibrator/geophone. Each source/receiver combination has a unique "wavelet" response to the initiation of a shot. Extensive data processing by experienced personnel is required to convert the individual wavelets to a common form. This conversion is necessary before the entire volume of recorded data can be merged to produce a unified image.

Other data processing challenges within the transition zone survey include 1) static time corrections that must be applied to the data subsets (each subset requiring a different set of statics, 2) water-column reverberations which can be extreme and might require specialized processing in order to reveal the subsurface reflections of interest, and 3) estimation and correction of the variability of geophone-seafloor coupling.

If the transition zone data are to be merged with the deep-water 3-D survey, additional data processing, including wavelet correction and ghost reflection corrections, must be applied. In any case, transition zone imaging requires extraordinary documentation (e.g., water depths, tidal variations) and seamless coordination of acquisition and processing.

#### **General data processing issues**

Major steps in current 2D and 3D data processing include: data conditioning (ambient noise attenuation, estimation and equalization of source wavelets from one shot to the next), 3D surface related multiple elimination (SRME), several passes of migration/tomography (velocity) analysis to determine subsurface velocities, 3D pre-stack reverse time migration (RTM) and post-image signal enhancements.

In marine surveys, successful data processing depends on good onboard quality control during acquisition. The survey vessel should have adequate computing capability to assure that noise and other possible processing issues can be successfully dealt with in the final processing flow.

While the data processing sequence will be evaluated in the survey design phase described above, it is also important to review the processing flow and image results of previously recorded data. For instance, in the CCCSIP, the images produced from the land-based data recorded in 2011 (vibrator and accelerated weight drop sources with nodal recording) should be reviewed to inform future processing decisions.

#### **References**

- 1. Wide-azimuth streamer acquisition for Gulf of Mexico subsalt imaging**  
*Chris Corcoran, Calin Perkins, David Lee, Paul Cattermole, Richard Cook, and Nick Moldoveanu*  
SEG Expanded Abstracts 25, 2910-2914 (2006)
- 2. The Winds of Change, Heloise Lynn, The Leading Edge, v. 23, 1156-1162.**
- 3. Breakthrough acquisition and technologies for subsalt imaging (see Figure 1)**  
*Denis Vigh, Jerry Kapoor, Nick Moldoveanu, and Hongyan Li*  
Geophysics 76, p. WB41-WB51 (2011)
- 4. A single-vessel method for wide-azimuth towed-streamer acquisition**  
*Nick Moldoveanu, Jerry Kapoor, and Mark Egan*  
SEG Expanded Abstracts 27, 65-69 (2008)

**Attachment 2**

**CURRICULUM VITAE**

**BRUCE GIBSON**

San Luis Obispo County, California

**CURRENT POSITION:**

San Luis Obispo County Supervisor (District 2); reelected in June, 2010 to second term through 2014. As Supervisor, I also serve on the following local Boards and Commissions, and am active in the California State Association of Counties.

**LOCAL BOARDS:**

Local Agency Formation Commission (LAFCO)  
San Luis Obispo Council of Governments (SLOCOG) (Chair)  
San Luis Obispo Regional Transit Authority (SLORTA)  
Air Pollution Control District (APCD) (Chair)  
Integrated Waste Management Authority (IWMA)  
San Luis Obispo First 5 Commission

**CALIFORNIA STATE ASSOCIATION OF COUNTIES (CSAC):**

Member, Board of Directors  
Chairman, Government Finance and Operations Committee  
Member, Coastal Counties Regional Association

**PREVIOUS GOVERNMENTAL SERVICE:**

2005 - 2006 Commissioner, San Luis Obispo County Planning Commission;  
2000 - 2003 Member, Ag Preserve Review Committee, San Luis Obispo County Advisory Committee for Williamson Act contract applications;  
1998 - 1999 Member, Facilities Advisory/Oversight Committee, Coast Union School District, Cambria, CA;

**PREVIOUS CONSERVATION/ENVIRONMENTAL ACTIVITIES:**

2001- 2006 Member, Board of Directors, Cayucos Land Conservancy (a private non-profit land trust);  
1998 - 2006 Member, Board of Trustees, The Land Conservancy of San Luis Obispo County, (a private, non-profit land trust). President, 1999-2001 and 2002-2004.

**PREVIOUS EMPLOYMENT:**

1990 - present Self-employed rancher/farmer, Cayucos  
1984 - 1989 Research Scientist, Rice University, Houston, TX, Director of Data Processing for the Department of Geology and Geophysics. Responsible for data processing of crustal-scale seismic reflection data and teaching of seismic reflection data processing techniques. Conducted research on seismic reflection response and imaging issues of randomly heterogeneous crustal materials.  
1976 - 1984 Senior Research Geophysicist, Western Geophysical Co., Houston, TX. Conducted research and development of seismic reflection imaging techniques. Published research on signal processing (deconvolution), and 2-D and 3-D time and depth migration imaging techniques.  
1973 - 1976 Research Assistant, University of Hawaii, Honolulu, HI

**EDUCATION:**

B.A., Physics, 1973	Pomona College, Claremont, CA
M.S., Geophysics, 1975	University of Hawaii, Honolulu, HI
Ph.D., Geophysics, 1989	Rice University, Houston, TX

**TECHNICAL PUBLICATIONS**

Gibson, B.S., M.E. Odegard, and G.H. Sutton, Nonlinear least-squares inversion of travelttime data for a linear velocity-depth relationship, *Geophysics*, 44, No. 2, 185-194, 1979.

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Gibson, B.S., Analysis of lateral coherency in wide-angle seismic images of heterogeneous targets, *J. Geophys. Res.*, 96, 10261-10273, 1991.

**SCIENTIFIC ORGANIZATION MEMBERSHIPS**

American Geophysical Union  
Society of Exploration Geophysicists

Attachment 2



*Pacific Gas and  
Electric Company*

Diablo Canyon Power Plant P.O. Box 58  
Avila Beach, CA 93424

July 13, 2012

PG&E Letter DCL-2012-637

Dr. Bruce Gibson  
Supervisor, District 2  
San Luis Obispo County  
San Luis Obispo, CA 93401

Response to June 20, 2012, Request for Information

Dear Dr. Gibson:

Please find attached a response to the questions that you presented in your June 20, 2012 letter associated with the Central Coastal California Seismic Imaging Project (CCCSIP).

After you have had time to review the responses, we are interested in bringing in our science team leads to expand upon the answers and address any other questions that may be generated from this response.

We look forward to further discussions on these important studies.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Strickland'.

L. Jearl Strickland  
*Director, Nuclear Projects*  
805-781-9785 (office)  
805-441-4208 (cell)  
[LJS2@pge.com](mailto:LJS2@pge.com) (email)

Enclosure

**Pacific Gas and Electric Company's Response to  
Bruce Gibson June 20, 2012, Request for Information**

**Introduction**

In 2008, the California Energy Commission (CEC) completed an assessment of the vulnerability of Diablo Canyon Power Plant (DCPP) to a major disruption due to a seismic event or plant aging, as required by CA Assembly Bill (AB)1632 (Blakeslee, Chapter 722, Statutes of 2006). As a result of that assessment, the CEC recommended that Pacific Gas and Electric Company (PG&E) complete additional seismic studies using three-dimensional (3D) seismic reflection mapping and other advanced geophysical techniques to explore fault zones near DCPP. In addition, PG&E funded U.S. Geological Survey research that reevaluated more than 20 years of earthquake data that led to the discovery of the Shoreline fault zone in 2008. In 2009 and 2010, both the California Public Utilities Commission (CPUC) and the California Coastal Commission (CCC) directed PG&E to complete the advanced studies recommended in AB1632 as part of their license renewal feasibility studies and reviews. The CPUC established an Independent Peer Review Panel (IPRP) in 2010 to provide an independent peer review and comment on these proposed seismic studies.

The PG&E High Energy Seismic Survey (HESS) program is one task in a series of comprehensive geologic/ geophysical investigations that PG&E has been conducting as part of the Central Coastal California Seismic Imaging Project (CCCSIP). The CCCSIP represents the continuation of earlier studies initiated in 2008 and 2009 that specifically addressed the Shoreline fault zone. The CCCSIP involves government, academic and industry partners including the National Science Foundation, Columbia University/ Lamont-Doherty Earth Observatory, the Scripps Institute of Oceanography, the University of Nevada/Reno, the CSU Monterey Bay Sea Floor Mapping Lab, Fugro Consultants Inc., Nodal Seismic, Bird Seismic Services, Fairfield Nodal, NCS SubSea, and others in order to collect the highest quality seismic and geophysical data using state-of-the-art technologies. In recognition of the substantial costs involved to perform these types of studies, PG&E has adopted a systematic, nested approach to conduct the CCCSIP. Regional scale surveys are used to identify areas for more comprehensive, high-resolution site-specific investigations.

In addition to the integration and interpretation of the diverse geologic and geophysical data sets collected as part of the CCCSIP, there are additional challenges and demands that are not usually encountered in industry work. These include the need for Nuclear Quality Assurance / Quality Control (QA/QC) oversight and documentation (including extensive software and hardware calibration and validation), participatory peer review requirements consistent with the needs of the informed technical community (including the CPUC IPRP, US Nuclear Regulatory Commission (NRC) and Senior Seismic Hazard Analysis Committee (SSHAC) processes), public transparency, and extraordinary environmental and permitting constraints.

The following comments are presented in response to the specific issues listed in Dr. Gibson's letter to PG&E dated June 20, 2012.

Request 1

*The overall design approach for both the offshore and transition zone surveys should be described. The survey design discussion should explain how survey acquisition parameters, data processing sequence, and interpretation products were chosen and how these three elements are integrated.*

Response 1

Initial IPRP review of PG&E'S plans focused on the geologic targets or fault segments to be surveyed and the potential impact of that information on the seismic hazard evaluation for DCP. Those geologic targets and their potential impacts on the DCP seismic hazard analysis were identified in PG&E's 2011 Shoreline Fault Zone report to the NRC. Updated ground motion models used in the NRC Report identified strike-slip earthquakes along the Shoreline and Hosgri fault zones as well as reverse-slip earthquakes on the Los Osos and San Luis Bay fault zones as the key contributors to seismic hazard at DCP.

To better constrain the four main parameters needed for a seismic hazard assessment: geometry (fault length, fault dip, down-dip width), segmentation, distance offshore from DCP, and slip-rate, PG&E conducted a series of sensitivity studies to document which of those four sets of parameters had the greatest impact on reducing the overall uncertainty for hazard estimates. The offshore target areas and the parameters to be addressed by the CCCSIP are listed in Table 1. These issues determined the design goals of both the Low and High Energy 2D and 3D Seismic Surveys.

**Table 1** List of Targets for Offshore Geophysical Studies

<b>Target Region</b>	<b>Technical Issue</b>	<b>Method</b>
Hosgri-San Simeon step-over	Geometry of the step-over. Is it really a segmentation point?	Low Energy 2D / 3D High Energy 3D
Hosgri fault offshore DCP	Slip Rate	Low Energy 2D / 3D
	Dip	High Energy 3D Regional geophysical studies
Shoreline fault zone	Geometry of northern segment	Low Energy 2D / 3D High Energy 3D

Target Region	Technical Issue	Method
	Southern extent	Low Energy 2D / 3D
	Slip Rate	Low Energy 2D / 3D
Hosgri-Shoreline Intersection	Structural relationship between the Hosgri and Shoreline fault	Low Energy 2D / 3D High Energy 3D
Los Osos fault	Structural relationship between the Hosgri and Los Osos fault	Low Energy 2D / 3D High Energy 3D
	Slip rate	Low Energy 2D / 3D
San Luis Bay fault	Dip	Low Energy 2D / 3D High Energy 3D

The overall design approach for both the LESS and HESS studies is dictated by the technical goals to be addressed as well geographic setting of the site (e.g., water depth, navigation obstacles), the capabilities of the survey vessel(s) and equipment, as well as environmental and permitting constraints

As shown in Table 1, the 2D and 3D LESS studies of the Shoreline fault conducted in 2010 and 2011 focused on the northern and southern ends, near Point Buchon and within San Luis Bay, respectively. These surveys addressed the shallow structure of the Shoreline fault as well as identified possible piercing points or areas where the Shoreline fault intersected recent geomorphic features in order to determine fault slip rates.

Both the LESS studies and the onshore 2D/ 3D seismic surveys in 2011 tested the feasibility of conducting further seismic profiling along the continental shelf offshore of DCP. Much of the Tertiary rocks within the onshore Irish Hills and offshore continental shelf are underlain by the highly chaotic Mesozoic Franciscan Formation. As discussed in Request 2, results from onshore seismic surveys in 2011 provided an important pilot test or feasibility for conducting additional HESS surveys offshore. Could PG&E, in fact, use 3D seismic survey techniques to image structures within the Franciscan? Based on these initial results, the subsurface structures are truly complex and intrinsically 3D; 2D seismic reflection data acquisition is not a reliable or appropriate approach to accurately image crustal structure in this area. Systematic 3D data acquisition with rigorous population of common mid-point (CMP) bins over a wide range of offsets and azimuths is necessary to obtain spatially accurate images of crustal structure in CCCSIP study area.

Based on the lessons learned from the 2011 onshore survey and advice from PG&E's contractors concerning marine 3D multichannel data acquisition, PG&E's response to Request 3 discusses the basic seismic acquisition parameters, such as spatial sampling interval and maximum source-receiver offset, needed to image the target structures listed in Table 1 at depth. One of the major survey design issues is the close proximity of the geologic targets to shore. The central section of the Shoreline fault lies within the Transition or Intertidal Zone in water depths less than 25 m. As discussed in Request 4, safety concerns about operating large vessels in shallow water with rocks and kelp beds precluded conventional approaches to seismic imaging. As a result, other strategies, including high resolution helicopter aero magnetics and marine gravity surveys as well as the deployment of marine nodes were developed to image the Transition Zone.

In order to constrain the deeper geometry of fault zones and image to the depths at which earthquake are occurring, 3D HESS surveys require the use of 6 to 8 km long streamers. This influences the orientation of the survey racetrack design. While the ideal seismic survey orientation is generally perpendicular to structure (dip lines), the close proximity of both the Hosgri and Shoreline faults to shore in the region between Point Buchon and Point San Luis (less than 1 streamer length) requires orienting survey lines parallel to the strike of the fault (strike lines) instead of perpendicular to the fault (dip lines). The overall width or footprint of these strike line survey tracks, however, is still influenced by the closest approach to shore. As shown in Figure 1, HESS Survey Racetracks or Boxes 1, 2, and 3 were designed to account for these geometric constraints.

As shown in Figure 1, HESS Survey Box 4 in Estero Bay is oriented to be roughly perpendicular to the strikes of the Shoreline, Los Osos and Hosgri faults and provides an opportunity to conduct dip survey lines in this area. This would provide a broader azimuthal coverage of complex geologic structures in the area, consistent with PG&E's response to Request 5.

The data acquisition and processing is addressed in PG&E's response to Request 6. Initially, data from each of the offshore, transition zone and onshore 3D surveys will be collected and processed independently. Accordingly, the first phase of the survey data acquisition planning is focused on producing data sets in an industry standard SEG-Y data format that be integrated at a later date. Post-cruise, the latest industry processing toolkits will be used to produce both 3-D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic Imaging and/or GeoTrace. Recent advances in 3D tomography and full waveform inversion (FWI) techniques will also be applied to these new data.

Once the seismic data are processed, interpretation teams consisting of geoscience professionals with expertise in specific areas (e.g., seismic interpretation, structural geology) will be assembled to integrate and interpret data following the delivery of final processed data. In addition to individual SEG-Y files, data will be merged in a Kingdom

Suite 3D volume or cube to facilitate analysis and visualization of data for interpretation and further analysis.

Request 2

*The offshore and transition zone survey design process should analyze results of recently-conducted land surveys to confirm the adequacy of acquisition parameters and processing flow.*

Response 2

The major findings from the 2011 onshore seismic reflection survey in the Irish Hills are:

- (1) Successful imaging of the Franciscan basement can be accomplished, contrary to previous expectations
- (2) The identification of swept frequency and geophone spacing parameters necessary to capture both shallow and deep imaging
- (3) There is a higher expectation of success in imaging the Transition Zone through the use of onshore and offshore seismic sources

The following sections provide a more detailed discussion of these results.

Proprietary seismic reflection data within the greater Irish Hills owned by ConocoPhillips was licensed and reprocessed to determine the effectiveness of several types of seismic sources and recording configurations. The results of the ConocoPhillips data analyses were used to define the 2011 2D onshore testing and data acquisition program in the Irish Hills.

The primary findings from the analyses of the ConocoPhillips data are presented first, followed by a summary of the findings from the 2011 2D onshore testing and data acquisition program in the Irish Hills

*1984 ConocoPhillips Data*

ConocoPhillips acquired Dynamite data from one line in the central portion of the Irish Hills north of the DCPD property. Most of the ConocoPhillips line was located in Tertiary rocks, with the north end of the line extending about 1 km north of the southern Edna fault trace into Franciscan rocks. ConocoPhillips acquired data from six lines in the Irish Hills although five of the six lines were located east of the DCPD property. Three of the ConocoPhillips lines used Dynamite and three of the lines used Vibroseis™ sources (Table 2).

**Table 2** 1984 ConocoPhillips Reflection Line Acquisition Parameters

Line Number	Line Name	Datum (ft)	Fold	Source	Channels	Group Interval (ft)	Shot Interval (ft)	Length (s)
1	p6502-1	800	24	Vibroseis™	96	82.5	165	4
3	p6502-3	800	24	Vibroseis™	96	82.5	165	4
4	p6502-4	200	24	Vibroseis™	96	82.5	165	4
6	p6502-6	800	24	Dynamite	96	110	220	4
9	p6598-9	200	24	Dynamite	96	110	220	4
13	p6598-13	1600	24	Dynamite	96	110	220	4

The ratio of signal to noise in the data is a function of acquisition parameters (Table 2), as well as the source and receiver configurations (Table 3). The deep shot holes and large charge (10 lb) used for line 13 (Table 3) produces the best overall signal quality, but the resolution of deeper structure is compromised by the high frequency (28 Hz) geophones used to record the Dynamite source and the limits of the maximum offsets attained with the 96 channel recording systems (Table 3). Also, there were many dead channels and frequency strong coherent electrical noise in most of the Dynamite shot records that further decreased signal strength.

**Table 3** 1984 ConocoPhillips Reflection Line Source and Receiver Configurations

Line Number	Line Name	Source	Sweep (Hz) or charge (lb)	Source Configuration	Geophone	Offset range (ft)
1	p6502-1	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
3	p6502-3	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
4	p6502-4	Vibroseis™	18-80 (12 s)	4 Failing Y-900	10 Hz	330-4208
6	p6502-6	Dynamite	0.5 lb	9 5 ft holes	28 Hz	110-5280
9	p6598-9	Dynamite	0.5 lb	9 5 ft holes	28 Hz	110-5280
13	p6598-13	Dynamite	10 lb	1 25 ft hole	28 Hz	110-5280

The sequence of steps in processing the data (Table 4) was designed and adjusted to evaluate signal quality as a function of frequency. Several high-frequency upper limits were selected for band pass filtering and the data stacked to determine the maximum frequency that produced the best signal-to-noise ratio. Although the Dynamite source

noise dominated at frequencies greater than 50-60 Hz and at frequencies greater than 40 Hz for times later than 2.3 to 2.5 seconds.

**Table 4** 1984 ConocoPhillips Data Processing Sequence

Step	Description
1	Reformat field SEG-Ydata
2	Vibroseis cross-correlation Sample rate 2 ms
3	Geometry definition (Vibroseis™ and Dynamite data)
4	Pick first breaks; Calculate Refraction Statics; 1 Layer Model; VO is 3000 feet/sec Datum is 200/800/1600 feet, replacement velocity is 7500/8000 feet/second
5	Trace edits and reversals
6	Amplitude recovery $T^{1.2}$ , Air blast attenuation
7A	Dynamite data only: Surface consistent deconvolution, operator 160ms, gap 18 ms, time variant spectral whitening, 6/12-57/65 Hz frequency limits determined from spectral analyses and stacking tests of the data, multiple gate equalization
7B	Vibroseis™ data only: Time variant spectral whitening, 8 - 80 Hz frequency limits, one gate equalization
8	Statics to floating datum
9	Interactive velocity analysis; Residual statics surface consistent; Interactive velocity analysis; Residual statics surface consistent; CDP trim statics
10	Final normal moveout; Initial mute; 500 ms agc
11	Flat datum statics, datum varies as per Table 1, VR is 7500/8000 fps
12	Create final unfiltered stack cdp stack $1/\sqrt{n}$ Time Variant Bandpass filter: For: Vibroseis™ data 10/18-55/65 hz. 0.0 - 1.7 sec. 8/18-35/45 hz. 2.3 - 4.0 sec. Fx predictive deconvolution, Trace balance For: Dynamite data 10/15-50/60 hz. 0.0 - 2.0 sec. 8/13-35/45 hz. 2.5 - 4.0 sec. Fx predictive deconvolution, Trace balance Output Final stack in SEG-Y format

The 28-Hz geophones used for acquisition of lines 6, 9, and 13 (Tables 2 and 3) reduce resolution at two-way travel times greater than 2.5 seconds because the stack tests revealed that there is little signal at times greater than 2.5 seconds in the Dynamite data at frequencies greater than 40 Hz (step 12 in Table 4). Because the frequency-dependent stacking tests showed that there is little signal in the Dynamite data at frequencies > 60 Hz, there is no need to use high-frequency geophones to acquire data in this area. Consequently, improved signal-to-noise would have been obtained for lines 6, 9, and 13 for depths > 8000 ft simply by using 10-14 Hz geophones, which have

good response characteristics to > 60 Hz. In fact, the Vibroseis™ data generally produced better images of folded Tertiary structure using 10 Hz geophones in the first 1.7 seconds of the section than the Dynamite data using 28 Hz geophones (step 12 in Table 4) because the wider frequency bandwidth of significant signal-to-noise with the lower frequency geophones made it possible to consistently produce a more compact wavelet and obtain better overall resolution of even shallow reflectors than the Dynamite data acquired with high-frequency geophones. The Vibroseis™ data were also acquired with a shorter group and source spacing that also decreased aliasing in regions of steep dip relative to the Dynamite data.

Geologic mapping along the ConocoPhillips line showed little relationship between observed mapped dip directions and angles and shallow apparent dips in the ConocoPhillips seismic reflection data. Consequently, a key requirement in the specification of data acquisition parameters for the 2011 field program was to include sufficiently high-resolution data acquisition parameters to properly resolve shallow, often steep dips observed in many areas of the Irish Hills.

#### *2011 Onshore 2D Seismic Reflection Field Program*

Permitting inquiries revealed that the only permitted sources would be surface sources and that drilling and explosive sources could not be permitted. Consequently, the seismic sources available for the 2011 onshore seismic reflection field program were Vibroseis™ and impact surface sources. Permitting restrictions limited source positions to roads, precluding the types of regular source geometries required to properly populate CMP bins as a function of offset and azimuth and conduct rigorous 3D imaging tests. Permits for seismic operations on public areas restricted both sources and receivers to road right-of-ways. Consequently, limited 3D imaging testing was restricted to private properties where private landowners permitted deployment of regularly-spacing receiver 2D arrays away from roads.

As is typical in the oil and gas industry when both shallow high-resolution imaging of young faults and imaging deep structures and/or reservoirs are required, two data acquisition programs were designed to meet each of these objectives. Since permitting restricted data acquisition primarily to 2D imaging along roads, both data acquisition programs were run along the same routes when possible to provide resolution of both shallow and deep structure; the large Vibroseis™ trucks could not always access areas accessible to the AWD and the AWD did not operate on some of the roads used by the Vibroseis™ trucks, so there is not uniform overlap in all areas of the two data acquisition programs.

The shallow velocities in the Tertiary Pismo syncline along ConocoPhillips line 13 were used along with a maximum frequency of 50 Hz to determine that a 30-ft group spacing would avoid aliasing associated with steep dips and surface wave aliasing for a maximum surface wave frequency of 25 Hz (surface wave amplitudes decreased substantially above 25 Hz). A third-generation 450-lb accelerated weight drop (AWD)

source was selected for shallow-high-resolution imaging tests and 2D production. This source could adjust its output force with adjustable nitrogen spring pressure so that it could operate on weak asphalt surfaces that had lost their bonding agents without producing any deflection of the road surface to ensure compliance with permits (permit compliance required no perceptible road deflection as measured with a 12-ft straight edge). The 450-lb AWD was also able to access narrower roads than large Vibroseis™ trucks to obtain shallow high-resolution data in these regions.

The 2011 field program began with a week of source testing on the DCPD facility to determine optimal production source parameters. Real-time field processing with a 2D 400-channel networked cable system was used to assess source and acquisition using 30-ft group intervals and 14 Hz geophones. AWD and Vibroseis source monitoring systems were used to measure near-source signatures and ensure precise synchronization of 4-5 Vibroseis™ trucks. Testing showed that four synchronized 64,000-lb Hemi-60 Vibroseis™ trucks provide excellent signal at offsets at least as far as 6 km. Specific Vibroseis™ testing systems were used to determine the sweep parameters that produced consistent phase lock between drive and output in a variety of surface conditions to ensure Vibroseis™ sweep stability and consistency across the entire project area. A long-duration linear sweep of 24 seconds from 5 to 60 Hz produced the best combination of good consistent long offset (> 6 km) signal-to-noise with a broad frequency bandwidth that was achievable across all the diverse geologic units in the Irish Hills necessary to achieve consistent source frequency bandwidth imaging of intermediate and deeper structure.

Initial testing within the DCPD property with the AWD showed that steep dips were generally confined to depths of < 2-3 km and that coherent 30 Hz signals from the DCPD turbines were very large within several km of the DCPD. A station spacing of 120-ft was used for the nodes that would record the large Vibroseis™ sources since it was apparent that deeper dips were generally not as steep as shallow thin-skinned structure and that deeper imaging might require restricting the data to the 5- < 30 Hz frequency bandwidth to achieve consistent signal to noise at depths of 8-18 km. A Vibroseis™ source spacing of 120 ft was used in most areas; this was decreased to 60 ft in areas where undershooting was required.

#### *2011 Onshore Field Program Findings*

Strikes and dips varying rapidly, both horizontally and in depth to 2 to 4 km throughout nearly all regions of the Irish Hills encompassed by the 2011 onshore seismic reflection program. The seismic imaging problem is truly complex and intrinsically 3D; 2D seismic reflection data acquisition is not a reliable or appropriate approach to accurately image crustal structure in this area. Systematic 3D data acquisition with rigorous population of CMP bins over a wide range of offsets and azimuths is necessary to obtain accurate images of crustal structure in the Irish Hills and adjacent areas. Multiple high-energy data acquisition geometries and source configurations are required to achieve image objectives for shallow and deep structure. The 30-ft group and source spacing used

with the AWD source and > 300 channels effectively imaged shallow (0-2 km) steep dips at all locations, except where bedding was essentially vertical, to maximum frequencies of 50 Hz. This data acquisition configuration imaging faults from the surface to 1-2 km depth identified in previous paleoseismic investigations within the DCPD property. Consequently, a group interval on the order of 30 ft will be effective in 3D high-resolution imaging to depths of several km throughout the Irish Hills region when combined with systematic wider aperture recording at a wider group spacing. A 30-ft group interval will be effective near the DCPD where shallow velocities are generally among the highest shallow velocities found in the Irish Hills region, particularly compared to slower velocities found in Tertiary rocks in the Pismo Syncline located north of the DCPD property. However, near DCPD the AWD source became less effective because DCPD coherent noise was not effectively reduced by vertically stacking AWD impacts, resulting in low signal-to-noise at offsets > 1000 m using the AWD source near the DCPD. Consequently, for 3D high-energy high-resolution imaging of shallow structure proximal to DCPD in areas inaccessible to large Vibroseis™ trucks, mini-Vibroseis™ sources should be used to allow precise phase tuning to suppress 30 Hz coherent noise. The same approach can be used with the large Vibroseis trucks to suppress the 30 Hz coherent noise. Tuning of a mini-Vibroseis™ source should be performed to evaluate nonlinear sweeps and other sweep parameters and strategies such as slip-sweep recording. Mini-Vibroseis™ sweep tuning testing is necessary to find the optimal sweep program that provides the best-balanced resolution of structure from the near surface to several km depth within several km of the DCPD. While nonlinear sweeps and/or slip-sweep methods may be appropriate for shallow imaging with the mini-Vibroseis™ trucks, linear sweeps should be used with the large Vibroseis™ trucks to ensure good long-offset signal-to-noise to obtain good images in the 4-18 km depth range.

The large Vibroseis™ trucks operated in combination with 7220 discrete nodal receiver positions provided consistent observations of good first breaks to 8-12 km offsets in most locations, and clear first breaks to a maximum offset of 19 km. A total of > 5,800,000 good quality first-breaks were picked from a possible set of 16,700,000 first breaks from all recorded source-receiver pairs that spanned an approximately 20 km by 20 km region of the Irish Hills. Near the DCPD where plant noise was highest, the large Vibroseis™ trucks provided good first-breaks at the noisiest recording sites to at least 4 km offset. Tomographic inversion with the first-breaks was used to solve for 3D velocity structure to depths of 2 to 3 km and long-wavelength and residual source and receiver statics. The 3D tomographic approach was necessary to eliminate uncertainties in first-order statics associated with shallow steep dips and complex shallow velocity and geologic structure associated with extreme topography and thin-skinned deformation that produced irregular, and often steeply dipping reflectors.

A 2D seismic reflection profile was constructed from the Vibroseis™ -node data for a region spanning Point Buchon and Point San Luis. Consistent high-quality reflections were observed to at least 13 to 14 km depth and generally extended to 17 to 18 km depth using data in the 5-25 Hz frequency band below about 3-4 km depth. Between

Point Buchon and Point San Luis, maximum offsets of 4 to 6 km provide consistent high-quality imaging to depths of about 8 to 9 km depth. Incorporating data recorded to maximum offsets of 8 to 12 km produces consistent images to about 14 to 15 km depth. The Franciscan basement exhibited persistent reflectivity to depths of 14 to 18 km throughout most of the Irish Hills. This suggests that a good rule of thumb for this region is that the maximum image depth will be approximately 1.5 times the maximum offset in the recorded data for high-energy sources such as four synchronized 64,000 lb Vibroseis™ trucks or > 3000 in<sup>3</sup> air guns. Recording of longer-offset air gun data with onshore and offshore nodes in the region between Point Buchon and Point San Luis would improve aperture and azimuthal coverage and ensure good migration performance to depths of 8 to 14 km for the region bounded by Point Buchon and Point San Luis, the Hosgri fault to the south and the southern Irish Hills within the DCPD property to the north.

3D velocities from the tomography strongly correlate with surface geology and previously inferred shallow (1 to 3 km) geologic structure used to construct the 3D velocity model used in the 2011 illumination study. The continuously recording nodes produced clear recordings of at least 18 earthquakes at receivers located throughout the entire Irish Hills survey area, representing at least 30,000-40,000 arrival times that can be used in 3D velocity-hypocenter tomographic inversions to improve resolution of crustal velocity structure below the maximum 3D tomographic imaging depths of the active source data (2 to 3.5 km). These earthquake arrival time data will provide important tomographic constraints on deeper (> 3 km depth) crustal velocity structure than is provided by the active source data and will improve migration performance at depths > 3 km relative to industry-standard processing.

The 2011 onshore high-energy testing results indicate that in near-shore locations adjacent to the DCPD onshore large Vibroseis™ sourcing should provide good signal to noise at least 4 km offshore, which would be a sufficient aperture to record the steeper dips observed in the first several km in the onshore-near-shore region proximal to the DCPD. Offshore recording of onshore Vibroseis™ sources is essential to record sufficient aperture to migrate steeply-dipping structures that trend offshore from the onshore data within 8 km of DCPD.

### Request 3

*The choice of basic parameters such as spatial sampling interval and maximum source-receiver offset should be discussed relative to the spatial resolution required to image expected target structures at depth. For instance, what spatial resolution is required to evaluate geologic markers that might provide a measure of fault slip rate?*

### Response 3

The NRC places a high emphasis/importance on mapping shallow, near surface geologic investigations in order to constrain the geomorphic expression of potentially

significant and capable seismic sources. Low Energy Seismic Surveys (LESS) rather than High Energy Seismic Surveys (HESS) are the preferred tool to evaluate fault slip rate. Offsets of recent geomorphic features can be measured and dated to provide estimates for fault slip rates. These data serve as the control for estimating the rates and magnitudes for design earthquakes.

HESS surveys can provide information about the deeper geometry of seismogenic faults in the area and help constrain the source characterization of these structures. The basic acquisition parameters for the proposed 2012 HESS study are summarized in Table 5. Spatial resolution (as expressed by bin sizes) for the marine LESS studies that were conducted off of Point Buchon and in San Luis Bay were 1.56m x 3.125 m and 3.125 m x 3.125 m, respectively. Bin sizes for the HESS studies, dictated by streamer group intervals (12.5 m) and cross line spacing (100m to 150 m) are estimated to be 6.25 m x 25 – 37.5 m, respectively.

**Table 5** Proposed HESS Acquisition Parameters

Survey Area	614 km <sup>2</sup>
Source	Two (2) 3300 in <sup>3</sup> arrays, 9m tow depth
Recording	Syntrack
Streamer	4 x 6000m solid Sentry streamers, 100 - 150 m cross line spacing, 9 m tow depth
Channels per Streamer	468
Group Interval	12.5 m
Maximum Offset	6000 m
Shot Spacing	37.5 m flip flop (75m per source)
Shot Interval	37.5 m
Source / Streamer Location Accuracy	Source 1 -2 m / Tail buoy 7-12 m
Record Length	10 seconds
Bin Size	25 - 37.5m x 6.25m
Sample Rate	2msec
Fold	40

Request 4

*The choice of towing only 4 streamers in the offshore survey should be evaluated. Typical industrial surveys deploy 10 or more streamers to improve survey efficiency (i.e., reduced acquisition time). This should be a significant issue for the proposed survey, which has been analyzed to have significant impacts to marine life, based on time exposure to the seismic source.*

Response 4

Today's industry design and practice is heavily guided by the specifics of the intended target. During the past decade, the energy sector has experienced a significant move towards subsalt imaging in deep water (water depths in excess of 5000 ft, target depths in the 20,000 ft range and beyond); this operational mode is especially true for the Gulf of Mexico, offshore Brazil, and West Africa. For efficiency in regions with little or no operational hazards (such as shallow seafloor outcrops), combined with significant target depths, the industry developed a new breed of vessels, including "ramform" designs, that can tow up to 10-14 streamers with dual flip-flopping sources. In an appropriate environment, this strategy can reduce data collection time by a factor of 2 or 3—although a significant increase in the day-rate cost is realized for such vessels. Nevertheless, there are downsides to this approach. First, with respect to water depth, operations of "ramform" and similar boats are limited to water depths greater than 75 m. For comparison purposes, vessels towing 4 to 6 streamers with dual source arrays can survey into water depths of 25 m or greater. Offshore Diablo Canyon, this operational limitation would force a vessel towing 10 to 14 streamers to move offshore by an additional 2 to 4 km (from northwest to southeast). This attempt at efficiency would not only significantly increase the width of the transition zone between marine and land surveys, but would also compromise imaging quality along the Hosgri Fault (due to a migration aperture width that would overlap the intended target, creating an imaging problem at depth). Second, increasing the width of the array would also introduce unintended imaging problems, especially for shallowest sections of the crust as a wide variety of azimuths at a given location are needed to construct an image, which can be problematic (e.g., such as back tracking anisotropic effects). Third, for shallow targets, the lack of near offsets within certain bins can obscure shallow imaging of important targets such as faults. A better strategy would encompass two overlapping 3D surveys, with a narrower array (4 to 6 streamers), but shot along sail-lines from different azimuths, as is proposed for Boxes 2 and 4 in Figure 1. Ultimately, it is unsafe to use vessels towing 10 to 14 streamers given seafloor depths offshore Diablo Canyon, and the need to image structures from the Hosgri Fault toward the shoreline. Finally, the importance of both shallow and deep target imagings requires an approach that is not solely focused on the deeper subset.

PG&E's Request for Proposals (RFP) for the HESS project initially specified 6 to 12 streamers of 4 to 8 km length or offset for the HESS. The original racetrack design for the HESS was based on a minimum operating water depth of 50 m, which

acknowledged safety concerns about operating in shallow water (presence of nearshore shallow rock outcrops, kelp beds, and other navigation obstacles). Input from the IPRP suggested extending the survey closer to shore, in shallower waters. Consultation with Columbia University Lamont-Doherty Earth Observatory, operators of the *R/V Langseth*, indicated that a safe operating depth could be extended to the 25 m contour for a closer approach to shore.

The minimum operational water depth for 10 or more streamer vessels is 75 m (3x deeper than identified for the *R/V Langseth*, 25 m) due to the depths of the lead-ins both online and in the turns. Operating at these depths would preclude imaging many of the near shore targets identified in the CCCSIP. The turning radius for a ten streamer vessel is 4 to 5 km vs. 2.5 km for a four streamer vessel. With the exception of Box 2, the 10 streamer line changes for Boxes 1 and 4 could be as long as the lines themselves and would impede navigation in tight areas such as Estero Bay. Shorter turns will allow more online or production time.

Ten streamer vessels are larger, require more deck space for equipment, tend to burn more fuel due to increased resistance (introducing additional air quality issues) and require a larger turning radius. Simply stating that 10-streamer multi-channel seismic (MCS) vessels are more efficient is not applicable to all environments, especially shallow-near shore environments. In fact, there might be no efficiency in survey time realized given the above considerations. The additional risk involved in using larger vessels in shallow coastal waters would also result in additional charges and risk premiums, as well as significant expense (i.e., millions of dollars) to mobilize/demobilize these vessels and equipment to the central coastal California area.

As noted above, the original RFP specified consideration of vessels capable of towing 6 to 10 streamers. Feedback from bidding and non-bidding firms concluded that the smaller vessels with less streamers were appropriate for the constraints of this location and this survey

#### Request 5

*The potential benefit of data acquisition over a wide (in contrast to the proposed narrow) source-receiver azimuth range should be evaluated for both image quality improvement and the ability to evaluate the orientation of maximum horizontal stress.*

#### Response 5

Collecting 3-D using a wide-swath geometry (e.g., 10 to 14 streamer configurations) is typically seen as a negative as anisotropic effects may need to be accounted for to produce a clean, crisp image. Nevertheless, constraining crustal anisotropy can help better understand the pattern of strain (not stress) in the crust, and hence, the history of deformation. The measurement of stress in the crust is elusive and certainly not the purview of the reflection seismology technique. See response to Request 7 below. A

better acquisition strategy would consist of overlapping 3-D survey boxes (e.g., Boxes 2 and 4 in Figure 1), shot from different azimuths, using a narrow footprint of towed streamers to ensure both safety, the ability to image the shallow most sections of the crust, and estimate crustal anisotropy.

Request 6

*The proposed seismic data processing flow, data processing contractor and experience should be specified.*

Response 6

A number of industry contractors have been identified to conduct both the onshore and offshore seismic data acquisition and processing for the CCCSIP. All of the work performed will be in compliance with Nuclear Quality Assurance (NQA-1) requirements as stated in 10 CFR 50, Appendix B and 10 CFR 21. The proposed processing flow for the 3D Diablo Canyon project will embody the latest, cutting-edge seafloor multiple removal and seismic imaging techniques (among a myriad of recent advancements) that are currently available within industry processing shops.

**Marine Navigation Processing:** NCS SubSea (Houston, TX; <http://www.ncs-subsea.com/>) will be responsible for the 3-D streamer navigation using Concept Systems' Spectra, Sprint and Reflex modules to provide the highest standard of streamer navigation. The flow chart in Figure 1 illustrates the software used, QC steps, and the outputs generated in industry data exchange formats for raw (P2/94) and processed (P1/90) navigation and positioning data

NCS Subsea has worked with Fugro and PG&E on the 3D Low Energy Seismic Survey (LESS) work offshore DCP in 2010, 2011 and the upcoming 2012 PCable survey in August 2012.

**Marine Seismic Data Acquisition and Processing:** Contractors from well-established firms such as Fugro Geoteam (Houston, TX; <http://www.fugro-geoteam.com/>) and/or GeoTrace (Houston, TX; <http://www.geotrace.com/>) will be onboard the *R/V Langseth* during acquisition and will be responsible for all data QC and QA. This oversight will include careful inspection of trace amplitudes for all shots, potential effects of swell noise, dynamic 3D binning of data volume, etc. Table 6 and Figure 2 show an example of the data processing flow that will be used for the marine HESS. Post-cruise, the latest industry processing toolkits will be used to produce both 3D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic Imaging and/or GeoTrace. Recent advances in full 3D tomography and waveform inversion (FWI) techniques will also be applied to these new data.

**Table 6 Typical 3D Marine Processing Flow**

Reformat  
De-signature to zero phase using filter designed from supplied far field signature  
Bandpass filter  
Resample Gun and cable static correction  
Velocity analysis @ 4x4 km  
Gain recovery  
*Targeted FK filter (shallow water only)*  
Time-frequency denoise (shot and receiver station domains)  
K dealias  
Tau-p mute direct arrival attenuation  
3-D SRME  
Velocity analysis @ 4x4 km  
Time-frequency denoise (shot and CDP domains)  
*Shot domain tau-p deconvolution and tau-p mute (shallow water only)*  
*Receiver domain tau-p deconvolution and tau-p mute (shallow water only)*  
Sort to CDP  
Velocity analysis @ 2km x 2km  
*Targeted FK filter (shallow water only)*  
Hi-resolution radon de-multiple  
Q compensation (phase only)  
*Time-frequency denoise*  
*Sort to offset domain*  
*Predictive deconvolution (shallow water only)*  
*Bin*  
Tidal correction  
Residual water column statics  
Pre-stack time migration  
Target migration lines 1 x1 km  
Build migration velocity model  
Interpolate to 12.5 x 12.5 m  
Pre-stack time migration (curved ray)  
Residual parabolic radon de-multiple  
Automatic residual velocity determination (every CDP)  
Normal moveout correction  
Mute  
Stack  
*Low frequency boost*  
Post stack filtering  
Bandpass filter  
Scaling

**Onshore Seismic Data Acquisition and Processing:** Onshore, Nodal Seismic (Signal Hill, CA; <http://www.nodalseismic.com/> ) and Bird Seismic Services (Globe, AZ; <http://www.birdseismic.com/> ) will be conducting the onshore data collection in 2012, as a continuation of onshore studies conducted in and around the Irish Hills in 2011 and as part of the Transition Zone imaging. Nodal Seismic will be responsible for operation of Vibroseis and Zland nodal data collection, and Bird Seismic will be responsible for high-resolution shallow data collection. Instrument specifications fro the Zland nodals can be found at <http://www.fairfieldnodal.com/Products/ZLand/specs.html>. Onshore data processing will be overseen by Fugro Consultants, Inc. (Denver, CO; <http://www.fugroconsultants.com>). Table 7 shows an example of the onshore data processing flow. As in the case of the marine multi-channel 3D data collection, post-survey analysis will use the latest industry processing toolkits to produce both 3D prestack time migration and prestack depth migration imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro Seismic imaging and/or GeoTrace. Recent advances in full 3D tomography and waveform inversion (FWI) techniques will also be applied to these new data.

**Table 7** Typical processing flow for land data including a mix of source types

Reformat
Geometry build and apply
Recording delay correction (separate correction for each source type)
Refraction static calculation
Gain Recovery
Linear noise suppression
Random noise suppression
Surface Consistent Deconvolution (with minimum phase conversion for Vibroseis™ data)
First-break picking
3D tomography
Full-waveform inversion (FWI)
3D solution for long wavelength and residual statics
Refraction static application
Velocity Analysis – one-mile grid
NMO application / Mute first breaks
Residual statics
Velocity Analysis – 2 <sup>nd</sup> pass
Residual statics (2 <sup>nd</sup> pass)
Surface consistent scaling (shot and receiver)
Linear noise suppression
Random noise suppression
Migration velocity analysis – half-mile grid(inline and cross line)
Pre-stack Kirchhoff time migration
Post-migration velocity analysis
NMO – Mute – CMP stack
Post-stack filtering, noise suppression
Pre-stack depth migration

**Transition Zone Data Collection and Processing:** FairfieldNodal (Sugar Land, TX; <http://www.fairfieldnodal.com/> ) will be responsible for the Transition Zone data collection using up to 600 Z700 marine nodes. Instrument specification for the Z700 Nodals can be found at <http://www.fairfieldnodal.com/Products/Z700/specs.html> Figure 3 shows an example of the Transition Zone 3D data processing flow. As in the case for both the onshore and marine multi-channel data, post-survey analysis will use the latest industry processing toolkits to produce both 3-D prestack time migration (PSTM) and prestack depth migration (PSDM) imagery. This processing will take place in Houston, Texas and will be contracted through an industry processing shop such as Fugro and/or GeoTrace. Recent advances in full waveform inversion (FWI) techniques will also be applied to these new data.

Request 7

*The potential benefit of evaluating vertical fracture alignment, maximum horizontal stress, and directional stress inequality should be discussed. While this information is not typically used in traditional seismic hazard analysis, it does relate to the physical state of the overall seismo-tectonic setting.*

Response 7

The evaluation of tectonic stress and strain are components of the seismic hazard analysis that is currently being conducted as part of the Senior Seismic Hazards Advisory Committee (SSHAC) process.

Principal stress directions can be determined from the evaluation of earthquake focal mechanisms and borehole hydro fracture data. Analysis of seismicity and earthquake focal mechanisms in the central coastal area indicates that the principal compressive stress direction,  $\sigma_1$  is N15°E  $\pm$  4° north of latitude 35°N and N47°E  $\pm$  15° south of latitude 35°N. As seen in Figure 4, this direction is consistent with a uniform NE-SW maximum horizontal stress orientation from borehole break out data in the area and the overall pattern of recent transpressional tectonic deformation (McLaren and Savage, 2001, *Seismicity of South Central Coastal California: October 1987 through January 1997*, *Bull. Seismological Society of America*, 91, 1629-1658)

Request 8

*The specific acquisition parameters and processing sequence of the transition zone survey should be discussed. Of particular importance would be the processing proposed to assure a high-quality seismic image after merging the transition zone data with the onshore and offshore survey data.*

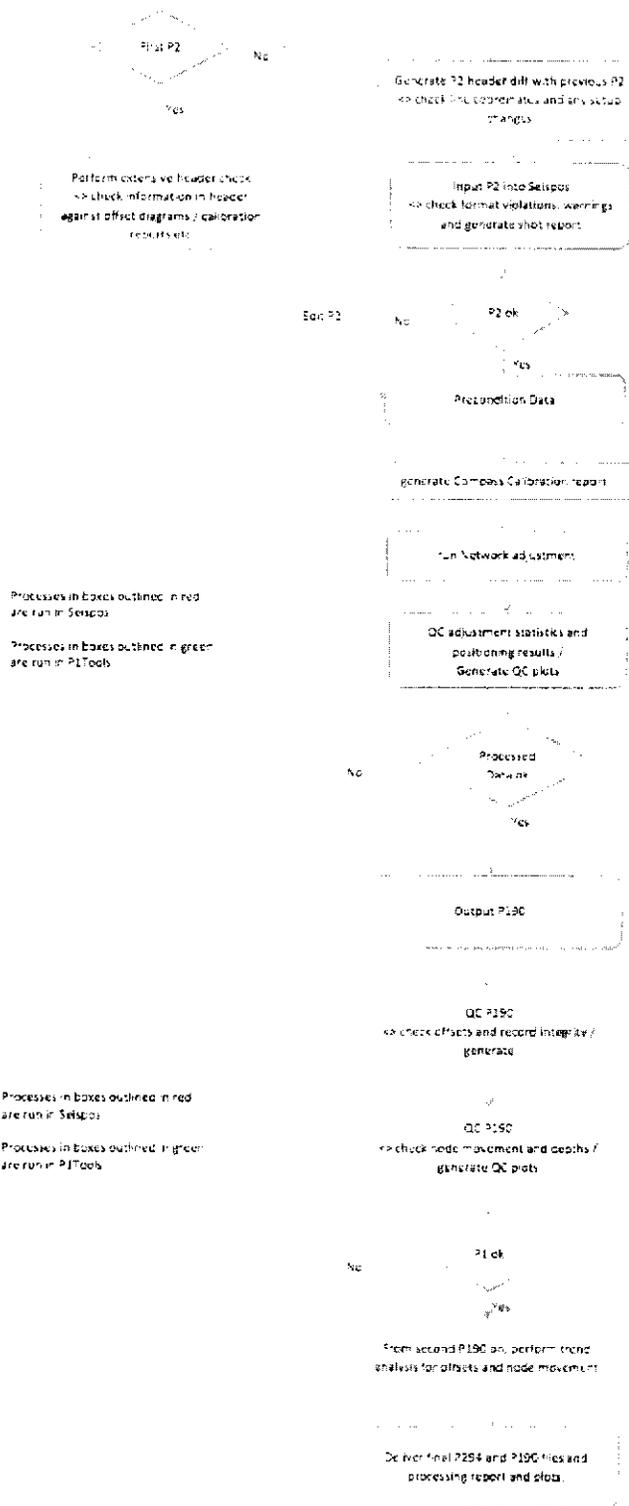
Response 8

The central segment of the Shoreline fault zone, between DCPD and Point San Luis, lies within the Transition or Intertidal Zone, where water depths are less than 25 m. As shown in Figure 1, the Transition Zone widens south of DCPD towards Point San Luis and the HESS Box 1 racetrack is oriented at angle to the coastline. PG&E has proposed to undershoot this gap in coverage by placing a series of marine nodes on the seafloor and using both marine airguns and onshore Vibroseis™ sources. The Draft EIR specified a deployment of 600 Z700 marine nodes placed in a series of five transects perpendicular to the coast with 50 m spacing between nodes. See Figure 1 for node transect locations. Instrument specification for the Fairfield Nodal Z700 Nodes can be found at <http://www.fairfieldnodal.com/Products/Z700/specs.html>

PG&E is currently working with industry seismic processing companies to update the 2011 Illumination study, based on improved velocity models from 2011 onshore survey, to optimize marine node placement as well as onshore and offshore imaging capabilities. Recognition of environmental restrictions, including placement of nodes on hard (rocky) bottom, avoidance of protected species, etc. need to be addressed before the final node configuration is established.

A processing flow of these Transition nodal data is shown in Figure 4. Once these data are processed they will be integrated with the onshore and offshore data to develop a comprehensive 3D volume of the study area for interpretation.





**Figure 2** Typical Marine Seismic Navigation Data Processing Flow  
 P2/94: Industry data exchange format for raw navigation and positioning data for seismic surveying  
 P1/90: Industry data exchange format for processed navigation and positioning data for seismic surveying. The P190 provides the processed position for each channel/group. SeisPos: Commercial software package for QC and processing of navigation and positioning data for seismic surveying. P1Tools: The QC component of the SeisPos software package.

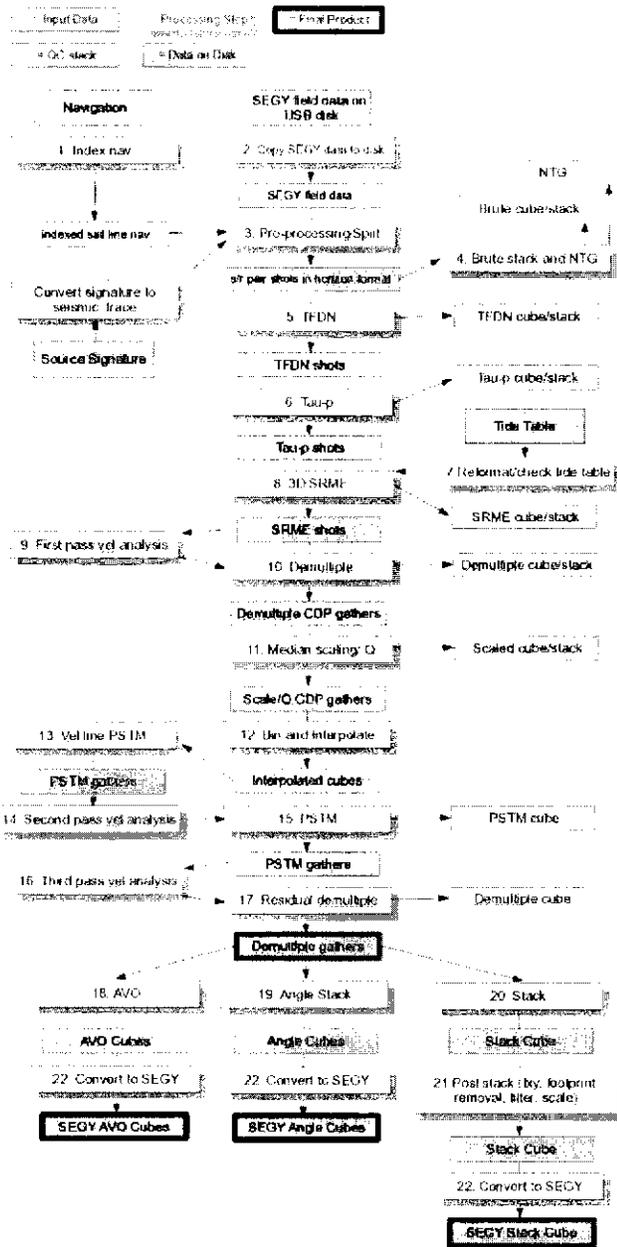
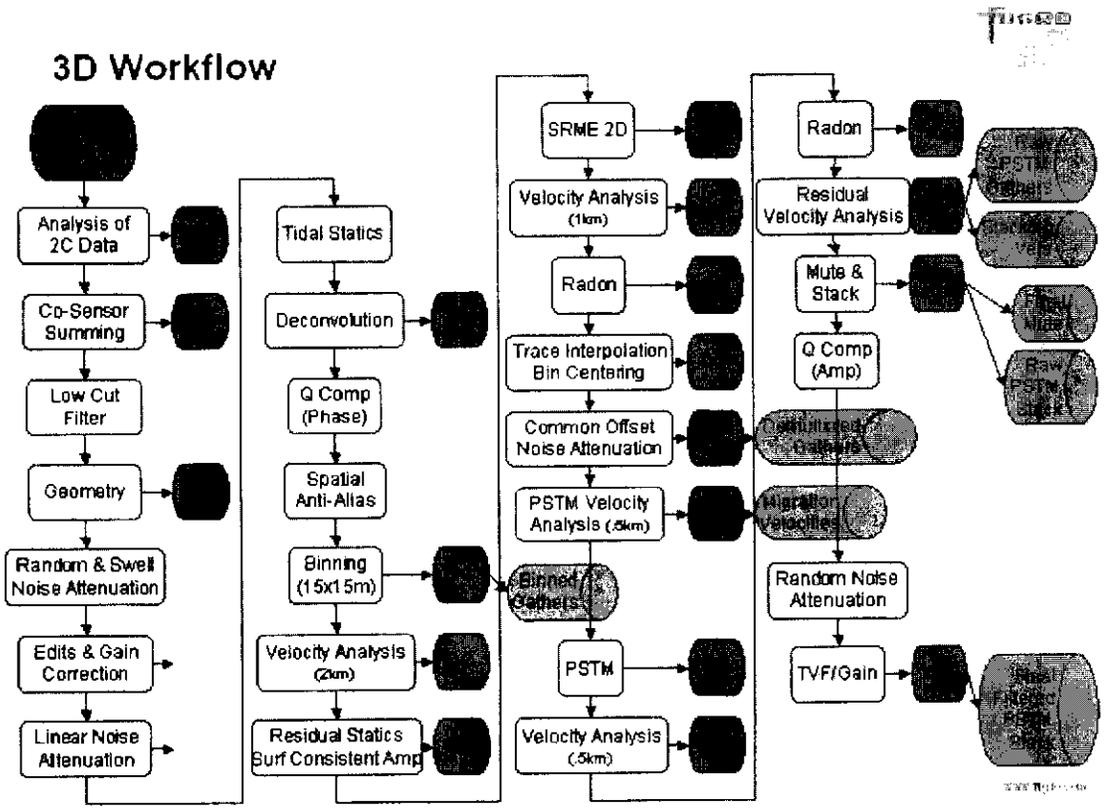
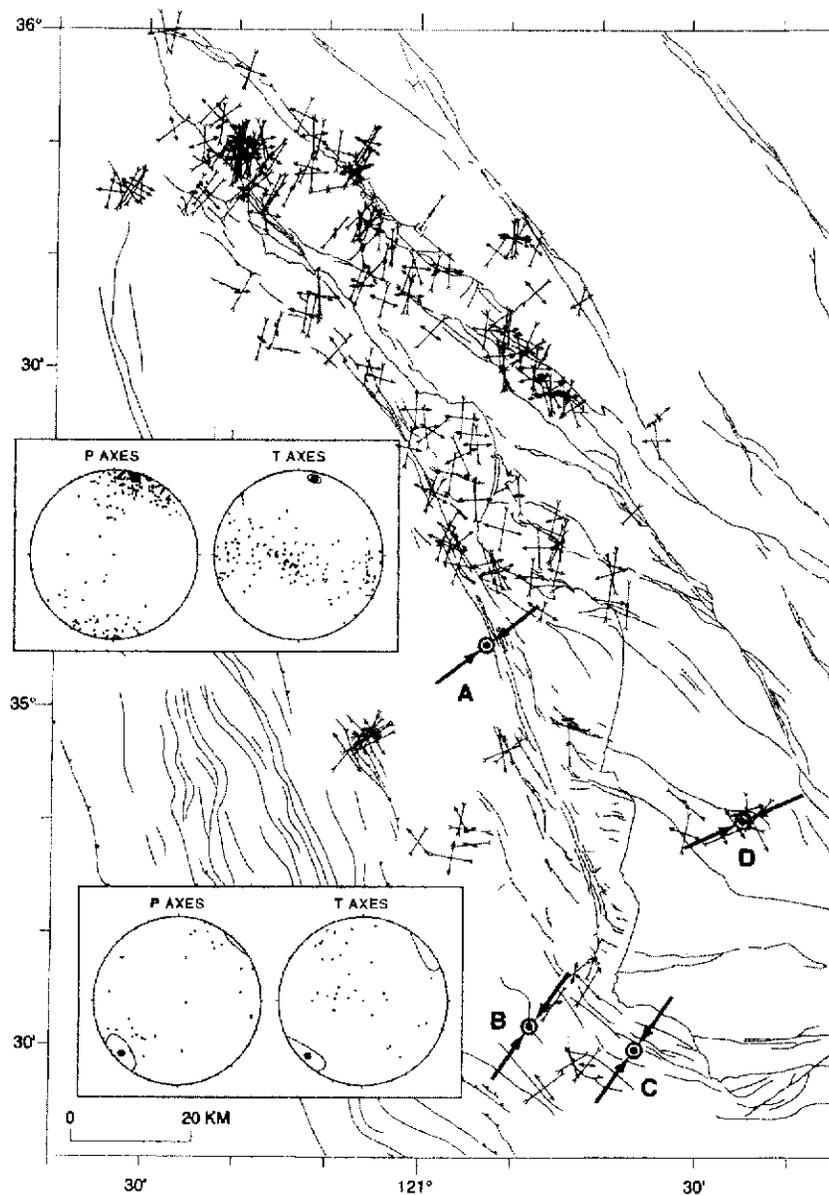


Figure 3 Typical 3D Marine Processing Flow



**Figure 4** Typical Transition Zone Processing Flow.

Note the co-sensor summing - this is utilizing multiple components in an Ocean Bottom Node or Cable to remove receiver ghosts.



**Figure 5** Horizontal surface projections of P and T axes from earthquake focal mechanisms. Encircled solid circles are locations of borehole breakout data. The two insets are stereo net plots of the distribution of P and T axes of the fault plane solutions for earthquakes in the northern and southern regions (i.e., north and south of 35°N). From McLaren and Savage, 2001.

## ATTACHMENT 3

July 29, 2012

### SUMMARY OF UNRESOLVED TECHNICAL ISSUES

The following sections include summary technical discussion of some issues remaining unresolved after discussions at the IPRP and the exchange of letters in Attachments 1 and 2.

#### Number of streamers

The proposed survey includes 4-streamer vessel operations in water as shallow as 25 m, in order to cover targets near shore. PG&E asserts (Attachment 2, pg 13) that boats capable of towing 10 or more streamers cannot operate in water depths shallower than 75 m. Recent communication from one industry seismic contractor indicates that a 10-streamer boat can operate in 25-m water depths under nominal conditions.

This project should be submitted for a complete survey design review that would include a navigational obstruction survey of the area and modeling of streamer tracking behavior (horizontal and vertical) based on modern streamer steering and control technology. The survey design review would assess data collection efficiency, including 1) the potential use of greater numbers of streamers, and 2) the application of a second shooting boat, which is a common industry practice that improves data collection efficiency and image quality as well.

As in other issues listed below, the survey design should aim to delineate the survey best suited to accurately image the expected targets. Only after that determination, should issues of feasibility, cost and schedule be considered in modifying survey design.

#### Transition zone data collection and processing

The Shoreline fault, a particularly important target of the survey, is overlain by shallow water and lies close to the shoreline (in the "transition zone"). PG&E's onshore surveys have identified steeply-dipping and complex structures of interest in this area. Gaining a high-quality image of these features in a transition zone environment will be challenging.

In this case shallow water receivers (nodes) are proposed along 5 irregularly spaced and oriented lines. While plots of common-midpoint coverage have been offered, there remain questions about whether this survey geometry can image the structures of interest.

Industry standard transition zone survey design would have modeled the seismic response of expected targets and adjusted survey geometry and data processing flow to assure image quality. The data processing flow is particularly important if data from the

transition zone survey are to be merged with onshore and offshore data in a single data volume.

#### Spatial sampling and shooting along strike

The IPRP has suggested eliminating the northernmost part of the survey (Box 3) because little new seismic hazard information was expected to be obtained (IPRP Report #3). In their response to the IPRP, PG&E disagrees, arguing that further survey of the Hosgri-San Simeon fault intersection could reveal important geologic detail.

Note that the survey direction of Box 3 (Attachment 2, Figure 1) is along the strike of the Hosgri-San Simeon faults. PG&E argues that this shooting orientation is necessary because shallow water near the shoreline constrains boat maneuvering. Strike line shooting is less preferred because the important geologic changes occur in the perpendicular (dip) direction (Attachment 2, pg 4).

The cross-line bin size of the HESS is nominally 25-37m. PG&E discusses in Attachment 2 that the onshore data show optimal group interval is closer to 10 m. Thus, the adequacy of the cross-line (dip direction) sampling in Box 3 (and other areas shooting along strike) should be reviewed.

As with other issues above, a comprehensive survey design approach would model the expected reflection response for the proposed survey geometry and processing sequence to confirm that features could be adequately imaged. This should be especially important in the northernmost area of the survey, where geologic details are to be assessed. A second shooting boat and streamer track overlap could also benefit cross-line resolution and should be studied.

#### Data processing coordination

Industry standard survey design integrates data acquisition, processing and interpretation. PG&E has helpfully listed numerous potential processing contractors and steps that appear to be state of the art (Attachment 2).

Given that, 1) data processing flows are listed as "typical" (not currently determined), 2) the expected data processing flow is complex, and 3) multiple surveys comprise the overall CCCSIP, a clear sense of how different data processing steps are coordinated is important. In particular, PG&E should identify who has the responsibility and authority to evaluate processing quality and make processing flow decisions.



## AVILA BEACH COMMUNITY SERVICES DISTRICT

Post Office Box 309, Avila Beach, CA 93424  
Office and Meeting Room - 191 San Miguel Street, Avila Beach  
Telephone (805) 595-2664 FAX (805) 595-7623  
E-Mail [Avilacsd@gmail.com](mailto:Avilacsd@gmail.com)

California Coastal Commission  
725 Front Street Suite 300  
Santa Cruz, CA 95060

Subject: Resolution of the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project

Honorable Commissioners:

Attached for your records is a Resolution from the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project.

Please consider the District's concerns in your deliberations relating to the Seismic Imaging  
Project.

Sincerely,

Peter Kelley  
President

**AVILA BEACH COMMUNITY SERVICES DISTRICT  
RESOLUTION 2012-09**

**A Resolution of the Avila Beach Community Services District  
Opposing the Central Coastal California Seismic Imaging Project**

WHEREAS, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing from November 1, 2012 through December 31, 2012 in and around the waters of Avila Beach; and

WHEREAS, the Avila Beach Community Services District has concerns regarding the proposed testing; and

WHEREAS, those concerns include the extension of recreational rockfish season to December 31, 2012, the potential deleterious effects on fish, and Marine mammals; and a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and

WHEREAS, the project has not adequately addressed the land side impacts related to fishing that include, but are not limited to, reduced tourism, reduced availability of fish for restaurants and other environmental issues; and

WHEREAS, the project has not identified an adequate mitigation and claims process for those affected; and

WHEREAS, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

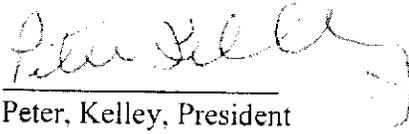
NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the Avila Beach Community Services District, San Luis Obispo County, California, as follows:

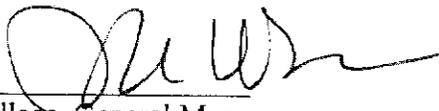
That the Avila Beach Community Services District does hereby oppose the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

Upon Motion of Director Kelley, seconded by Director Janowicz, and on the following roll call vote to wit:

AYES:	Kelley, Janowicz, Rowe
NOES:	None
ABSENT:	One Vacancy
ABSTAINING;	Yoder

The foregoing Resolution 2012-09 Opposing the Central Coastal California Seismic Imaging Project is hereby adopted this 9<sup>th</sup> day of October 2012.

  
\_\_\_\_\_  
Peter, Kelley, President

ATTEST:   
\_\_\_\_\_  
John L. Wallace, General Manager



October 29, 2012

**DIRECTORS:**

Allan S. MacKinnon  
*President*

Michael Thompson  
*Vice President*

James Bahringer  
*Director*

Muril N. Clift  
*Director*

Gail Robinette  
*Director*

Mary Shallenberger  
Chair, California Coastal Commission  
North Central Coast District Office  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

**SUBJECT:** PG&E Offshore High-Energy Seismic Study  
(November 2012 – Coastal Committee Meeting Agenda Item)

Dear Commissioners:

As part of the October 25, 2012 regular meeting agenda, the Cambria Community Services District Board of Directors discussed and directed staff to draft a comment letter for submittal to the California Coastal Commission opposing PG&E's proposed Central Coastal Seismic Imaging Project as currently proposed.

**OFFICERS:**

Jerry Gruber  
*General Manager*

Timothy J. Carmel  
*District Counsel*

Kathy A. Choate  
*District Clerk*

PG&E's once 540-square-mile Offshore Central Coastal California Seismic Imaging Project in its revised proposal has been reduced to cover 129 square miles off the coast of Estero Bay from Port San Luis to Morro Bay; an area adjacent to the Monterey Bay National Marine Sanctuary, the largest national marine sanctuary and one of the largest marine protected areas in the United States. Dozens of endangered species use these waters and the loud sounds emitted by the air guns could injure marine wildlife or drive it away from the area. This area is a most treasured and protected area of marine life.

Local coastal opponents of the test maintain it violates the California Coastal Act, and dispute PG&E's low risk assessment of injury and mortality to marine life and mammals, the damage to the ecosystem, as well as to the fishing industry and economy of the much treasured Coastal area from Port San Luis to Morro Bay.

The Cambria Community Services District Board of Directors joins other local governmental entities; including the City of Morro Bay, San Simeon Community Services District, SLO County North Coast Advisory Council, and Monterey County Board of Supervisors, in opposition to PG&E's Central Coast Seismic Imaging Project.

Sincerely,

Allan S. MacKinnon  
Board President

c: San Luis Obispo County Board of Supervisors

# MONTEREY COUNTY

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## BOARD OF SUPERVISORS

FERNANDO ARMENTA, *Vice Chair, District 1*

LOUIS R. CALCAGNO, *District 2*

SIMÓN SALINAS, *District 3*

JANE PARKER, *District 4*

DAVE POTTER, *Chair, District 5*

October 12, 2012

Mary Shallenberger  
Chair, California Coastal Commission  
North Central Coast District Office  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

**SUBJECT: PG&E Offshore High-Energy Seismic Study  
(November 2012 - Coastal Committee Meeting Agenda Item)**

Dear Chair Shallenberger:

On behalf of the Monterey County Board of Supervisors, I am writing to express our concerns regarding the Pacific Gas & Electric (PG&E) proposal for offshore high-energy seismic study near the Diablo Canyon Power Plant.

While we are concerned with the seismic safety of the region surrounding PG&E's Diablo Canyon Nuclear facility, those concerns must be balanced with the disturbance of marine mammals and fish in the environmentally sensitive survey areas.

PG&E plans to use the research vessel *Langseth* to tow an array of air guns through the waters that include two state marine protected areas which is adjacent to the Monterey Bay National Marine Sanctuary, the largest national marine sanctuary and one of the largest marine protected areas in the United States. The air guns emit loud sounds into the ocean that penetrate Earth's crust resulting in three-dimensional images of the earthquake faults near Diablo Canyon which are intended to give seismologists a better picture of the seismic danger facing the nuclear power plant. However, dozens of endangered species use these waters and the loud sounds emitted by the air guns could injure marine wildlife or drive it away from the area (McCauley, R.D. et al 2000).

One of the main concerns is that the high-energy sound blasts could disturb and/or damage animal life, particularly cetaceans such as whales, porpoises and dolphins, all of which use the area off of the Central Coast as a migratory route to and from their annual feeding and birthing areas. Marine mammals such as whales, porpoises and dolphins use sonar and hearing to navigate and communicate, such seismic testing could damage their sensitive systems leading them off-route and possibly missing critical milestones along their routes putting them at risk to be in the wrong areas at the wrong time of the year.

We request that PG&E seek alternatives to the manner in which it researches potential seismic safety concerns so that to the maximum degree practical these efforts protect and respect the marine protected areas and Monterey Bay National Marine Sanctuary, thereby preserving the environment and economic viability of our pristine coastal areas while simultaneously safeguarding the public.

Sincerely,



Dave Potter, Chair  
Monterey County Board of Supervisors

cc:     Congressman Sam Farr  
          Senator Dianne Feinstein  
          Senator Barbara Boxer  
          Governor Gerald Brown  
          Assembly Member Luis Alejo  
          Assembly Member Bill Monning  
          Senator Anthony Cannella  
          Senator Sam Blakeslee  
          John Laird – Secretary, California Resources Agency  
          Monterey County Board of Supervisors  
          Lew C. Bauman – CAO, Monterey County  
          Charles J. McKee – County Counsel, Monterey County  
          Benny Young – Director, Resources Management Agency, Monterey County  
          Nicholas E. Chiulos – Director, Intergovernmental & Legislative Affairs, Monterey County  
          Clerk of the Board, Monterey County  
          John E. Arriaga – JEA & Associates  
          Brent R. Heberlee – Nossaman LLP

# *Coastal San Luis Resource Conservation District*

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645 Main Street Suite F Morro Bay, CA 93442 (805)772-4391 (fax)772-4398

October 8, 2012

Honorable Commissioners of the  
State Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA. 94105-2219

RECEIVED

OCT 12 2012

CALIFORNIA  
COASTAL COMMISSION

RE: Comments on the Request by Pacific Gas and Electric Company to Conduct Acoustical Seismic Testing off the Coast of central San Luis Obispo County

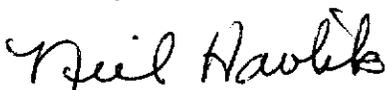
Dear Commissioners:

The Coastal San Luis Resource Conservation District (CSLRCD) is an independent special district whose mission is to protect and enhance the natural and agricultural resources found within the district boundaries. Those boundaries include the Pacific Ocean shoreline from the northern city limit of the City of Morro Bay all the way south to the San Luis Obispo-Santa Barbara County line. We do not comment upon projects affecting these resources to simply urge denial of such projects, but rather to offer recommendations intended to make them better. We offer this letter in that spirit.

CSLRCD accepts the fact that the Diablo Canyon Nuclear Power Plant is a significant physical and economic feature of the Central Coast, that it is likely to remain so for a long time, and that it is of paramount importance that the best and most up-to-date information on the hazards associated with the plant and its coastal location be in possession of decisionmakers at all levels. Having said that, however, we remind the Commission that the Central Coast is noted for its great beauty and for the great diversity of wildlife—including marine wildlife—found here. The potential for damage to marine wildlife is certainly present and as reported in the media, may be very great. The need for the best available information about seismic hazards must therefore be weighed in some measure against the potential for harm to the rich marine wildlife of the area.

For example, if a less impacting technology can obtain 90% or more of the needed information, or obtain it with 90% of the accuracy of a more impacting technology, should that less impacting technology be used? We do not know the answer to such a question, but urge that it be asked, and if it has been asked, that it be asked again before committing to a given approach. We would urge the Commission—and the applicant, Pacific Gas and Electric Company—to be absolutely certain that the testing methodology is the best methodology available, and that the information obtained from that methodology is the least harmful to the natural environment of the area.

Sincerely,



Neil Havlik, PhD., President, Board of Directors  
Coastal San Luis Resource Conservation District



# City of Morro Bay

Morro Bay, CA 93442

(805) 772-6205

**RECEIVED**

September 21, 2012

SEP 25 2012

California Coastal Commission  
Deputy Director Dan Carl  
725 Front Street, Ste. 300  
Santa Cruz, CA 95060-4508

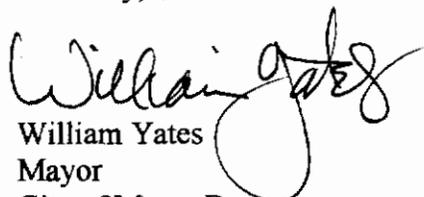
CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

RE: City of Morro Bay's Strong Opposition to the Central Coast Seismic Imaging Project

Dear Mr. Carl:

The City of Morro Bay, at their regular City Council meeting held Tuesday, September 11, 2012 unanimously passed Resolution 49-12, opposing the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas & Electric. We have attached that Resolution in hopes that you take into consideration our many concerns that PG&E has yet to address.

Sincerely,

  
William Yates  
Mayor  
City of Morro Bay

Attachment: Resolution 49-12, "Resolution of the City Council of the City of Morro Bay, California Opposing the Central Coastal California Seismic Imaging Project"

FINANCE  
595 Harbor Street

ADMINISTRATION  
595 Harbor Street

FIRE DEPT.  
715 Harbor Street

PUBLIC SERVICES  
955 Shasta Avenue

HARBOR DEPT.  
1275 Embarcadero Road

CITY ATTORNEY  
595 Harbor Street

POLICE DEPT.  
850 Morro Bay Boulevard

RECREATION & PARKS  
1001 Kennedy Way

**RESOLUTION NO. 49-12**

**RESOLUTION OF THE CITY COUNCIL  
OF THE CITY OF MORRO BAY, CALIFORNIA  
OPPOSING THE CENTRAL COASTAL CALIFORNIA  
SEISMIC IMAGING PROJECT**

**THE CITY COUNCIL  
City of Morro Bay, California**

**WHEREAS**, the Central Coastal California Seismic Imaging Project proposes to perform seismic testing from November 1, 2012 through December 31, 2012 in and around the waters of Morro Bay; and,

**WHEREAS**, the City of Morro Bay sent a letter to the California State Lands Commission regarding the Draft Environmental Impact Report outlining numerous concerns; and,

**WHEREAS**, those concerns included the extension of recreational rockfish season to December 31<sup>st</sup>, the short-term, long-term and permanent effects on fish, fishing, and fish stocks; the short-term, long-term and permanent effects on marine mammals; a portion of the seismic project boundary being located within a highly rich Marine Protected Area; and, the inability for vessels to leave and enter the Morro Bay Harbor; and,

**WHEREAS**, the project has not taken into consideration the land side impacts related to fishing that include, but are not limited to, reduced fish landing and processing activity, fish availability for restaurants, tourism and other environmental issues; and,

**WHEREAS**, the project has not identified an adequate mitigation and claims process for those affected; and,

**WHEREAS**, the project does not include an adequate monitoring plan for assessing fish stock recovery in either the short or long term periods.

**NOW, THEREFORE, BE IT RESOLVED**, that the City of Morro Bay opposes the Central Coastal California Seismic Imaging Project being proposed by Pacific Gas and Electric.

**PASSED AND ADOPTED** by the City Council of the City of Morro Bay at a regular meeting thereof held on the 11<sup>th</sup> of September 2012, by the following vote:

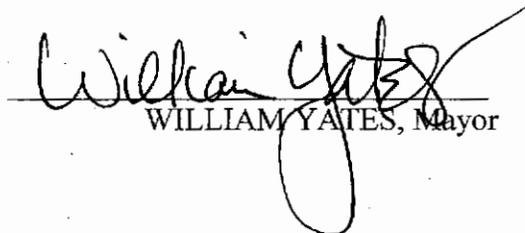
AYES: Borchard, Johnson, Leage, Smukler, Yates

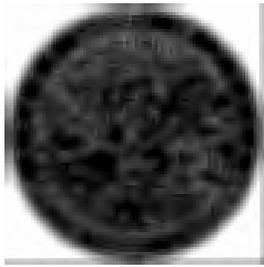
NOES: None

ABSENT: None

ATTEST:

  
JAMIE BOUCHER, City Clerk

  
WILLIAM YATES, Mayor



DEPARTMENT OF PLANNING AND BUILDING

September 11, 2012 (2<sup>nd</sup> UPDATED 11:32 AM)

Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont St. Suite 2000  
San Francisco, CA 94105

SUBJECT: Consolidated permitting for the PG&E Seismic Imaging Project

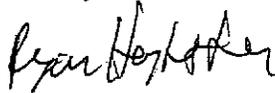
Dear Mr. Teufel:

On behalf of Pacific Gas and Electric, the County of San Luis Obispo is requesting that the portions of the PG&E Seismic Imaging Project within the County permit jurisdiction be considered for combined processing by the Coastal Commission. Per §30601.3 of the California Coastal Act, the Coastal Commission may process and act upon a consolidated coastal development permit application, if the proposed project requires a coastal development permit from both a local government with a certified local coastal program and the commission, and the applicant, the appropriate local government, and the commission, which may agree through its executive director, consent to consolidate the permit action, provided that public participation is not substantially impaired by that review consolidation.

As you know, PG&E is proposing to conduct seismic imaging along the central coast region within a defined project area (see attachment from PG&E titled Expanded Project Description August, 30, 2012 for which this letter is based). Portions of the seismic imaging project have already been reviewed by the County last fall and have been determined to be exempt from requiring a Coastal Development Permit (see attached letter dated May 20, 2011). The work which was determined to be exempt included vibrosis trucks and nodes within County right of ways, and it is the County's understanding that this work has been completed to date. Additional work however, includes installing nodes within the State Parks jurisdiction of the sand areas in Morro Strand which were not exempted from requiring a permit. This additional work in the sand include installation of 100 nodes (by hand) along the sand-spit of Morro Strand. It is this additional work within the County permit jurisdiction that is being requested in this letter for combined processing.

Thank you for consideration of this request. Can you please confirm that the Coastal Commission will process and act upon a consolidated coastal development permit application for the project described above. Please call me at 805/788-2351 if you would like to discuss this further.

Sincerely,



Ryan Hostetter  
Planner III  
Coastal Team

Cc: Kris Vardas, PG&E

Attachments: Latest Expanded Project Description (revision 8 August 30, 2012)  
Letter from County Planning dated May 20, 2011



## 1.0 EXPANDED PROJECT DESCRIPTION

The following updated project description was prepared by Pacific Gas and Electric Company (PG&E) in support of the proposed Offshore Central Coastal California Seismic Imaging Project (Project). This update reflects revisions to the project that have resulted as part of the permitting process and in particular the recent California State Lands Commission project approval which resulted in the elimination of portions of the originally planned survey area and the expansion of the project to a two year work window. All Project related activities will occur within the central area of San Luis Obispo County, California (Figure 1-1). The following summarizes the proposed offshore deep seismic data collection survey operations proposed for 2012.

### 1.1 PROJECT TITLE

Offshore Central Coastal California Seismic Imaging Project

### 1.2 PROJECT APPLICANT'S NAME AND ADDRESS

Pacific Gas & Electric Company  
Mr. Jude Fledderman, Director, Strategic Projects  
Diablo Canyon Power Plant  
Mail Code 104/6/602C  
Post Office Box 56  
Avila Beach, California 93424

### 1.3 PURPOSE AND OBJECTIVES

The purpose of the proposed survey is to conduct additional seismic studies in the vicinity of the Diablo Canyon Power Plant (DCPP) and known offshore fault zones near DCPP. These seismic studies will provide additional insights of any relationships or connection between the known faults as well as enhance knowledge of offshore faults near DCPP. The proposed deep (10 to 15 kilometers [km] or 6 and 9 miles [mi]), high energy seismic survey (HESS) (energy >2 kilo joules) would complement the shallow (< 1km/0.6 mi), low energy (< 2 kilo joules) 3D seismic reflection survey. The first and second phases of low energy 3D seismic surveys were conducted offshore DCPP by PG&E in November 2010 and January 2011, respectively. The third and last phase of the low energy 3D seismic surveys is being conducted in late summer 2012.

The objectives of the proposed high energy 3D seismic survey are to:

- Record high resolution wide 2D and 3D seismic reflection profiles of major geologic structures and fault zones in the vicinity of DCPP.
- Obtain improved deep (>1 km [>0.6 mi]) imaging of the Hosgri and Shoreline fault zones in the vicinity of the DCPP to constrain fault geometry. (Scheduled for 2013 survey activities)
- Obtain improved (>1km [>0.6 mi] depth) imaging of the intersection of the Hosgri and Shoreline fault zones near Point Buchon.
- Augment current regional seismic data base for subsequent use and analysis.



The Project is being undertaken due to public concerns with operating a nuclear power plant in a seismic active area of California after the Fukushima Daiichi emergency. PG&E will obtain as much seismic information as possible, while minimizing environmental impacts consistent with the permits required by federal, state, and local agencies to conduct the studies. The Project timeframe is limited to fall months (October 15 to December 31) due to whale and fish migration as well as nesting bird constraints. The survey will also be conducted over a period of two years to reduce the extent of annual exposure of marine resources to high seismic energy levels.

The current Project scope has been designed to minimize environmental impacts to the greatest extent feasible and has been modified to further recognize agency input and specific concerns regarding resident species of marine mammals within the survey area. PG&E is proposing to conduct the studies 24-hours per day, 7 days per week (24/7). This schedule is designed to reduce overall air emissions, length of time for operation in the water thereby reducing impacts to marine wildlife, commercial fishing, and other area users. PG&E will work with environmental agencies to appropriately address the balancing of public health and safety and environmental concerns during the conduct of these studies.

#### **1.4 PROJECT LOCATION**

The proposed Project would be conducted within the coastal (onshore and nearshore) and offshore marine waters between Morro Bay and San Luis Bay, offshore San Luis Obispo County, California (Figure 1-1). The proposed survey will cross all the major geologic units in the study area and image their structure at depth using high-resolution 2D and 3D seismic reflection profiling techniques. The offshore and onshore survey sound source transects, as well as the nearshore/onshore geophone locations, have been developed to address the project objectives as well as ongoing input from the California Public Utilities Commission's Independent Peer Review Panel (IPRP) and the survey contractor (Lamont-Doherty Earth Observatory – Columbia University).

#### **1.5 3D SEISMIC DATA ACQUISITION TARGET AREAS FOR 2012**

The proposed 3D seismic survey race tracks will encompass an area of approximately 740.52 km<sup>2</sup> (285.9 mi<sup>2</sup>). The race tracks within the Project area are divided into the two "primary target areas," (Boxes 2 and 4) which are described below and are shown on Figure 1-2. Box 3 was eliminated from the survey plan based on input from the IPRP process and associated CSLC permit approval. Box 1 has been scheduled for the 2013 work window and will be subject to a supplemental review process. The offshore (vessel) survey would be conducted in both federal and state waters and water depths within the proposed survey areas ranging from 0 to over 400 m (1,300 ft); the State three-mile limit is the teal line in Figure 1-1. The Point Buchon Marine Protected Area (MPA) lies within portions of the survey area. The Monterey Bay National Marine Sanctuary (MBNMS), a federally-protected marine sanctuary that extends northward from Cambria to Marin County, is located north and outside of the Project area.

**Survey Box 2. (Survey area from Estero Bay to offshore Santa Maria River Mouth)**

- Area: 406.04 km<sup>2</sup> (156.77 mi<sup>2</sup>)
- Total survey line length is 2,148.2 km (1,334.8 mi)
- Strike line surveys along the Hosgri fault zone and Shoreline, Hosgri and Los Osos fault intersections

**Survey Box 4. (Estero Bay)**

- Area: 334.48 km<sup>2</sup> (129.14 mi<sup>2</sup>)
- Total survey line length is 1,417.6 km (880.9 mi)
- Dip line survey across the Hosgri and Los Osos fault zones in Estero Bay

Figure 1-2 shows the proposed survey transit lines. These lines depict the survey lines as well as the turning legs. The full seismic array is firing during the straight portions of the track lines, as well as the initial portions of the run out sections and later portions of run in sections. During turns and most of the initial portion of the run ins, there will only be one air gun firing (mitigation air gun). Assuming a daily survey rate of approximately 8.3 km/hr (4.5 knots for 24/7 operations), Survey Box 2 approximately 14 days, and Survey Box 4 approximately 9.25 days. When considering mobilization, demobilization, equipment maintenance, weather, marine mammal activity, and other contingencies, the proposed survey is expected to be completed in 49.25 days. For an in-depth look into the project schedule, refer to Section 1.8 - Project Schedule.

**1.6 PROJECT ACTIVITIES**

The proposed survey involves both marine and some limited onshore activities. The offshore components consist of operating a geophysical survey vessel and support/monitoring vessels within the areas shown in Figure 1-2 and transiting between the two different survey box areas extending between the Santa Maria river mouth and Estero Bay, as shown in Figure 1-2. The geophysical survey vessel would tow a series of sound-generating air guns and sound-recording hydrophones along pre-determined shore-parallel and shore-perpendicular transects to conduct deep (10 to 15 km [6 to 9 mi]) seismic reflection profiling of major geologic structures and fault zones in the vicinity of DCP.

The nearshore actions include the placement of a small number of seafloor geophones (e.g. Fairfield Z700 nodal units) in nearshore water areas (to approximately 70 m (229.6 ft) isobath). Detailed descriptions of the proposed actions for each component are provided below.

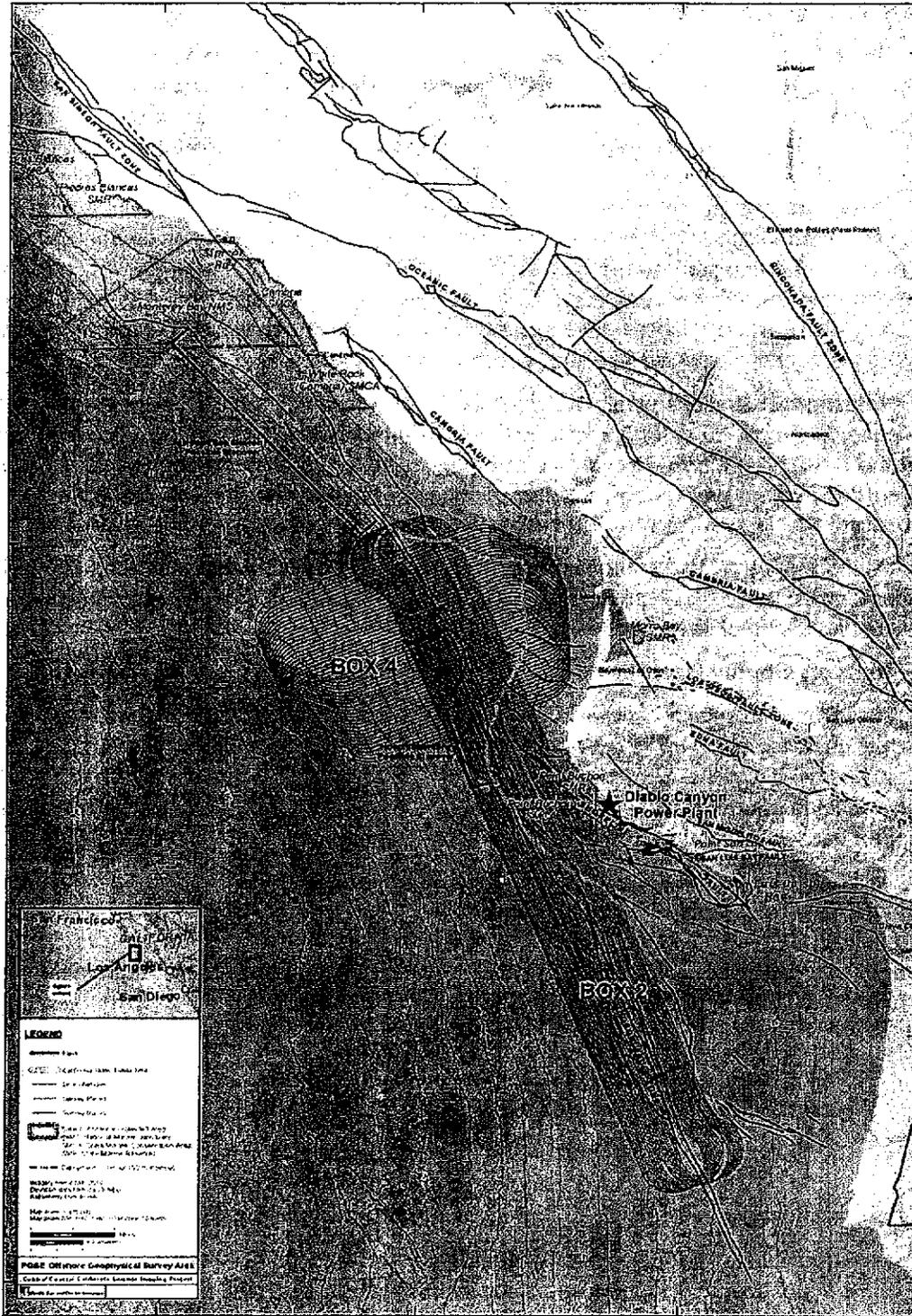


Figure 1-2. Proposed 2012 Project Survey Track Line Map



### 1.6.1 Mobilization and Demobilization

The offshore 3D marine survey equipment and vessels are highly specialized and typically not available in California. The proposed seismic survey vessel (*R/V Marcus G. Langseth [R/V Langseth]*) is currently operating on the west coast and is available to conduct the proposed survey work. The *R/V Langseth* would transit south prior to the start of survey operations (October 15 through December 31, 2012). Once the vessel has arrived in the Project area, the survey crew, any required equipment, and support provisions would be transferred to the vessel. The proposed survey vessel is supported by a chaseboat (*R/V Sea Trek or equivalent*) and scout/shore support boat (*M/V Dolphin II or equivalent*). Any additional scout/monitoring vessels required for the Project will be drawn from local vessel operators. Upon completion of the offshore survey operations, the survey crew would be transferred to shore and the survey vessel would transit out of the Project area.

Nearshore operations would be conducted using locally available vessels such as the *M/V Michael Uhl (M/V Uhl)*. Equipment, including the geophones and cables, would be loaded aboard the *M/V Uhl* in Morro Bay Harbor and transferred to the offshore deployment locations. Following deployment and recovery of the geophones and cables, they would be transferred back to Morro Bay Harbor for transport offsite.

Onshore receiver line equipment would be deployed by foot-based crews supported by four-wheel drive vehicles or small vessels. Once the Project has been completed, the equipment would demobilize from the area by truck.

### 1.6.2 Offshore Survey Operations

The proposed offshore seismic survey would be conducted with geophysical vessels specifically designed and built to conduct such surveys. PG&E has selected the *R/V Langseth*, which is operated by the Lamont-Doherty Earth Observatory (Columbia University). The following outlines the general specifications for the *R/V Langseth* geophysical survey vessel and the support vessels needed to complete the offshore survey.

In water depths from 25 to 305 m (82 to >1,000 ft), the *R/V Langseth* will tow four hydrophone streamers with a length of approximately 6 km (3.7 mi). The intended tow depth is approximately 10 m (32.8 ft). Flotation is provided on each streamer, as well as Streamer Recovery Devices (SRD). The SRD are activated when the streamer sinks to a pre-determined depth (e.g. 50 m [164 ft]) to aid in recovery.

- Primary vessel – *R/V Langseth* is 71.5 m [235 ft] in length and is outfitted to deploy/retrieve hydrophone streamers and air gun arrays, air compressors for the air gun array, and survey recording facilities.
- Chase boat – *R/V Sea Trek* is 38.7 m (127 ft) in length and will be deployed in front of the *R/V Langseth* to observe potential obstructions, additional marine mammal monitoring and support deployment of seismic equipment.
- Third vessel – *M/V Dolphin II* is approximately 20 m [65 ft] in length and would act as a scout boat and support vessel for the *R/V Langseth*.
- Nearshore work vessel (approximately 50 m [150 ft] in length and would be used to deploy/retrieve seafloor geophones in the shallow water (0-20m) zone (e.g. *M Uhl*).

- **Monitoring Aircraft** – Partenavia P68-OBS "Observer", a high-wing, twin-engine plane or equivalent. The aircraft would be used to perform aerial surveys of marine mammals.

**Survey Vessel Specifications.** The *RV Langseth* would tow the air gun and hydrophone streamers array along predetermined lines (Figure 1-2). When the *RV Langseth* is towing the air gun and streamer array the vessel will "fly" the appropriate USCG-approved day shapes (mast head signals used to communicate with other vessels) and display the appropriate lighting to designate the vessel has limited maneuverability. The turning radius is limited to 3 degrees per minute (2.5 km [1.5 mi]). Thus, the maneuverability of the vessel is limited during operations with the streamers.

The *RV Langseth* has a length of 71.5 m (235 ft), a beam of 17.0 m (56 ft), and a maximum draft of 5.9 m (19.4 ft). The *RV Langseth* was designed as a seismic research vessel, with a propulsion system designed to be as quiet as possible to avoid interference with the seismic signals. The ship is powered by two Bergen BRG-6 diesel engines, each producing 3,550 hp, which drive the two propellers directly. Each propeller has four blades, and the shaft typically rotates at 750 revolutions per minute (rpm). The vessel also has an 800 hp bowthruster, which is not used during seismic acquisition. The operation speed during seismic data acquisition is typically 7.4 to 9.3 km/h (4.6 to 5.7 miles/h). When not towing seismic survey gear, the *RV Langseth* typically cruises at 18.5 km/h (11.5 miles/h).

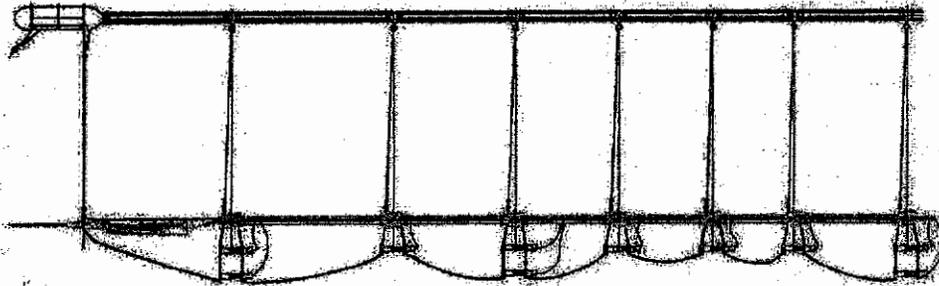
Other details of the *RV Langseth* include the following:

- **Owner:** National Science Foundation
- **Operator:** Lamont-Doherty Earth Observatory of Columbia University
- **Flag:** United States of America
- **Date Built:** 1991 (Refitted in 2006)
- **Gross Tonnage:** 3834
- **Accommodation Capacity:** 55 including ~35 scientists

**Air Gun Description.** The survey will be shot using two tuned air-gun arrays, consisting of two sub-arrays with 1,650 cubic inches (in<sup>3</sup>). The array would consist of a mixture of Bolt 1500LL and Bolt 1900LLX air guns. The subarrays would be configured as two identical linear arrays or "strings" (Figure 1-3). Each string would have ten air guns; the first and last air guns in the strings are spaced 16 m apart. Nine air guns in each string would be fired simultaneously (for a total volume of approximately 3,300 in<sup>3</sup>), whereas the tenth is kept in reserve as a spare, to be turned on in case of failure of another air gun. The subarrays would be fired alternately during the survey. Each of the two subarrays would be towed approximately 140 m (459 ft) behind the vessel and would be distributed across an area of approximately 12 by 16 m (40 by 50 ft) behind the primary vessel, offset by 75 m (250 ft). Discharge intervals depend on both the ship's speed and Two Way Travel Time (TWTT) recording intervals. For a 16-second TWTT, air guns will be discharged approximately every 37.5 meters (123 ft) based on an assumed boat speed of 4.5 knots. The firing pressure of the subarrays is 1,900 pounds per square inch (psi).

During firing, a brief (~0.1 s) pulse of sound is emitted. The air guns would be silent during the intervening periods.

The tow depth of the air gun array would be 9 m (29.5 ft). Because the actual source is a distributed sound source (9 air guns) rather than a single point source, the highest sound levels measurable at any location in the water would be less than the nominal single point source level. In addition, the effective (perceived) source level for sound propagating in near-horizontal directions would be substantially lower than the nominal omni-directional source level because of the directional nature of the sound from the air gun array (i.e. sound is directed downward).



**Figure 1-3. One Linear Air Gun Array or String with Ten Air Guns,  
Nine of Which Would Be Operating.**

Details regarding the proposed 18-air gun array (2 Strings) specifications are as follows:

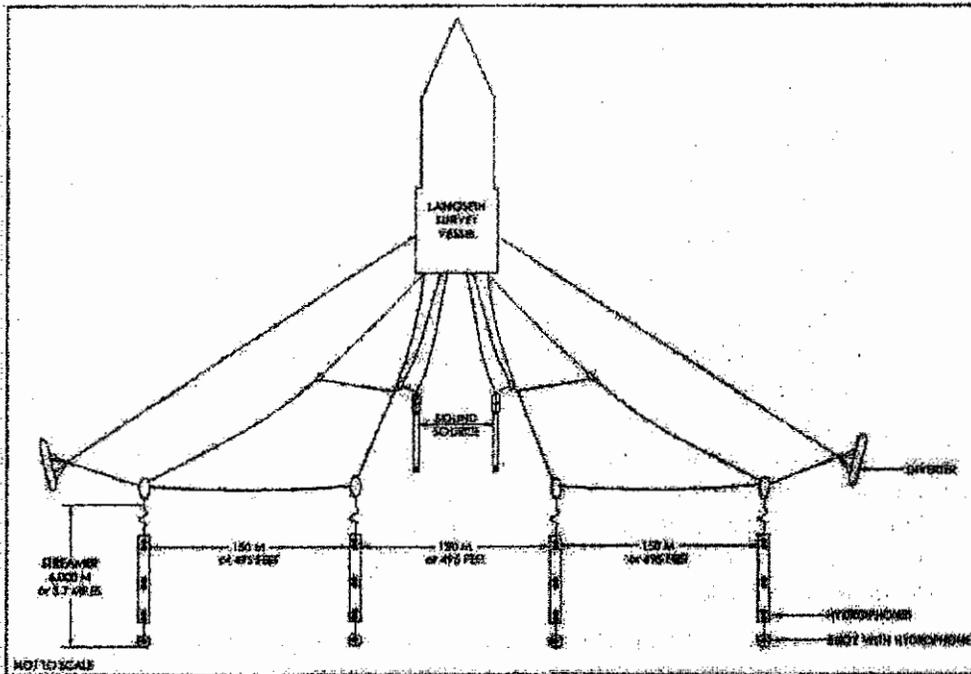
- Energy Source: Eighteen 2,000 psi Bolt air guns of 40-360 in<sup>3</sup>
- Source output (downward): 0-pk is 42 bar-m (252 dB re 1  $\mu$ Pa · m); pk-pk is 87 bar-m (259 dB)
- Towing depth of energy source: 9 m (29.5 ft)
- Air discharge volume: ~3,300 in<sup>3</sup>
- Dominant frequency components: 0-188 Hertz (Hz)

Compass Birds would be used to keep the air guns at a depth of 9 m (29.5 ft) and the vessel speed during data collection would range from 7.4 to 9.3 km/h (4 to 5 nautical miles per hour [knots]). The sound source would be generated by the discharge of the air guns approximately every 37.5 m (123 ft) which is based on an assumed vessel speed of 8.3 km/h (4.5 knots). The expected timing of the shots is once every 15 to 20 seconds.

**Hydrophone Streamer Description.** The survey will be recorded using a system array of four hydrophone streamers, which would be towed behind the *R/V Langseth*. Each streamer would consist of Sentry Solid Streamer Sercel cable approximately 6,000 m (3.7 miles) long. The streamers are attached by floats to a diverter cable, which keeps the streamer spacing at approximately 100 to 150 m (328 to 492 ft) apart

A series of seven hydrophones is present along each streamer for acoustic measurement. The hydrophones would consist of a mixture of Sonardyne Transceivers. Each

streamer will contain three groups of paired hydrophones, with each group approximately 2,375 m (7,800 ft) apart. The hydrophones within each group would be approximately 300 m (984 ft) apart. One additional hydrophone will be located on the tail buoy attached to the streamer cable. In addition, one Sonardyne Transducer would be attached to the air gun array. Compass Birds would be used to keep the streamer cables and hydrophones at a depth of approximately 10 m (33 ft). One Compass Bird would be placed at the front end of each streamer. The Figure 1-4 depicts the configuration of both the streamer and air gun array used by the *R/V Langseth*.



**Figure 1-4. *R/V Langseth* Air Gun and Streamer Deployment**

Details regarding the proposed hydrophone streamer and acoustic recording equipment specifications are provided in Table 1-1.

**Table 1-1. Summary of Offshore Streamer Features**

<b>Hydrophone Type</b>	<b>Sonardyne XSR5 Transceiver 7885 (Standard)</b>
Length of Individual Unit (approximate)	85.8 centimeters (33.8 inches)
Diameter of Individual Unit (approximate)	7.5 centimeters (3.0 inches)
Weight of Individual Unit in Air (approximate)	7.3 kilograms (16.0 pounds)
Number of Units per String	5
<b>Hydrophone Type</b>	<b>Sonardyne XSR5 Transceiver 8005 (Long Life)</b>
Length of Individual Unit (approximate)	91.1 centimeters (35.9 inches)
Diameter of Individual Unit (approximate)	8.9 centimeters (3.5 inches)
Weight of Individual Unit in Air (approximate)	10.4 kilograms (22.9 pounds)
Number of Units per String	2
<b>Hydrophone Type</b>	<b>Sonardyne HGPS Transducer 7887 (Right Angle)</b>
Length of Individual Unit (approximate)	56.3 centimeters (22.2 inches)



Diameter of Individual Unit (approximate)	9.4 centimeters (3.7 inches)
Weight of Individual Unit in Air (approximate)	9.6 kilograms (21.2 pounds)
<b>Depth Sensor</b>	<b>ION Model 5011 Compass Bird</b>
Length of Individual Unit (approximate)	120 centimeters (48.2 inches)
Weight of Individual Unit in Air (approximate)	8.32 kilograms (18.3 pounds)
Number of Units per Streamer (approximate)	4
Number of Units per String	1
<b>Streamer Type</b>	<b>Thompson Marconi Sentry</b>
Streamer Depth (approximate)	10 meters (33 feet)
Group Interval (approximate)	12.5 meters (41 feet)
Group Length (approximate)	12.5 meters (41 feet)
Number of Groups	468
Length of Streamer	6 kilometers (3.7 miles)
Source: Columbia University	

**Acoustic Measurements.** The strength of the air gun pulses can be measured in a variety of ways, but National Marine Fisheries Service (NMFS) commonly uses “root mean square” (in dB re 1µPa [rms]), which is the level of the received air gun pulses averaged over the duration of the pulse. The rms value for a given air gun pulse is typically 10 dB lower than the peak level, and 16 dB lower than the peak-to-peak level (McCauley *et al.*, 1998, 2000).

The noise modeling for the proposed 3D seismic survey was conducted based on the results of mathematical modeling conducted by Greeneridge Sciences, Inc. (2011). The model results are based upon the air gun specifications provided for *R/V Langseth* and seafloor characteristic available for the Project area. Safety and Exclusion zone dimensions are based on NMFS definitions for Incidental Harassment Authorizations (IHA). The Safety Zone is the distance within which received sound levels are modeled to be greater than 160 db and the Exclusion Zone is the distance within which received sound levels are modeled to be greater than 180 db. Distances to received levels of 120, 154, 160, 170, 180, 187, and 190 dB re 1µPa (rms) are also detailed in Table 1-2.

**Table 1-2. Calculated Radii for Upslope, Downslope and Alongshore Propagation Paths**

Sound Pressure Level (SPL) (dB re 1 µPa)	Upslope Distance (In Shore)			Downslope Distance (Offshore)			Alongshore Distance		
	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>	M <sup>1</sup>	SM <sup>2</sup>	NM <sup>3</sup>
190	250	0.16	0.13	280	0.17	0.15	320	0.20	0.17
187	390	0.24	0.21	370	0.23	0.20	410	0.25	0.22
180	1,010	0.63	0.55	700	0.43	0.38	750	0.47	0.40
170	2,990	1.86	1.61	1,760	1.09	0.95	1,760	1.09	0.95
160	6,210	3.86	3.35	4,450	2.77	2.40	4,100	2.55	2.21
154	8,570	5.33	4.63	7,820	4.86	4.22	6,780	4.21	3.66
120	24,650	15.32	13.31	251,320	156.16	135.70	94,870	58.95	51.23

M<sup>1</sup> = Meters; SM<sup>2</sup> = Statute miles; NM<sup>3</sup> = Nautical Miles

**Multibeam Echosounder and Sub-bottom Profiler.** Along with the air gun operations, two additional acoustical data acquisition systems will be operated from the *R/V Langseth* continuously during the survey. The ocean floor will be mapped with a Kongsberg EM-122 multibeam echosounder (MBES) and a Knudsen 320B sub-bottom profiler (SBP).

The Kongsberg EM-122 MBES operates at 10.5–13 (usually 12) kHz and is hull-mounted on the *R/V Langseth*. The transmitting beam width is 1 or 2-degree fore-aft and 150-

degree athwartship. The maximum source level is 242 dB re 1  $\mu$ Pa (rms). Each "ping" consists of eight (in water >1,000 m/3,300 ft deep) or four (<1000 m/3,300 ft) successive fan-shaped transmissions, each ensonifying a sector that extends 1 degree fore-aft. Continuous-wave (CW) pulses increase from 2 to 15 ms long in water depths up to 2,600 m (8,350 ft), and frequency-modulated (FM) chirp pulses up to 100 ms long are used in water >2,600 m (8,350 ft). The successive transmissions span an overall cross-track angular extent of about 150 degree, with 2 ms gaps between the pulses for successive sectors. (See Table 1-3)

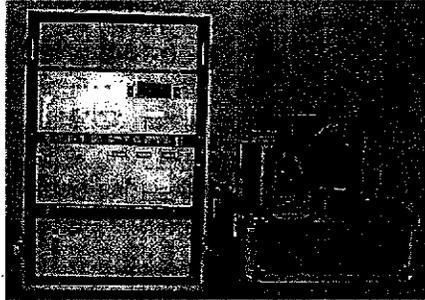
The Knudsen 320B SBP is normally operated to provide information about the sedimentary features and the bottom topography that is being mapped simultaneously by the MBES. The beam is transmitted as a 27-degree cone, which is directed downward by a 3.5-kHz transducer in the hull of the *R/V Langseth*. The maximum output is 1,000 watts (204 dB), but in practice, the output varies with water depth. The pulse interval is 1 sec, but a common mode of operation is to broadcast five pulses at 1-sec intervals followed by a 5-sec pause.

Both the Kongsberg EM-122 MBES and Knudsen 320B SBP are operated continuously during survey operations. Given relatively shallow water depths of the survey area (20 – 300 m), the number of 'pings' or transmissions would be reduced from 8 to 4, and the pulse durations would be reduced from 100 ms to 2-15 ms for the Kongsberg EM-122. Power levels of both instruments would be reduced from maximum levels to account for water depth. Actual operating parameters will be established at the time of the survey. Additional details are provided in Table 1-3.

**Table 1-3. *R/V Langseth* Sub-bottom Profiler Specifications**

Maximum source output (downward)	204 dB re 1 $\mu$ Pa·m; 800 watts
Dominant frequency components	3.5 kHz
Bandwidth	1.0 kHz with pulse duration 4 ms 0.5 kHz with pulse duration 2 ms 0.25 kHz with pulse duration 1 ms
Nominal beam width	30 degrees
Pulse duration	1, 2, or 4 ms

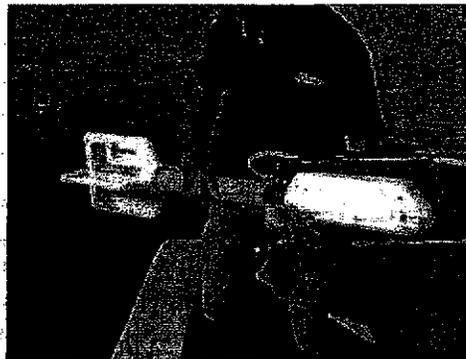
**Gravimeter (BGM-3).** The *R/V Langseth* will employ a Bell Aerospace BGM-3 gravimeter system (Figure 1-5) to measure very tiny fractional changes within the Earth's gravity caused by nearby geologic structures, the shape of the Earth, and by temporal tidal variations. The BGM-3 has been specifically designed to make precision measurements in a high motion environment. Precision gravity measurements are attained by the use of the highly accurate Bell Aerospace Model XI inertial grade accelerometer.



**Figure 1-5. Bell BMG Marine Gravity Meter**

**Magnetometer (G-882).** The *R/V Langseth* will employ a Bell Aerospace BGM-3 geometer which contains a Model G-882 cesium-vapor marine magnetometer (Figure 1-6). Magnetometers measure the strength and/or direction of a magnetic field, generally in units of nanotesla (nT) in order to detect and map geologic formations. These data would enhance earlier marine magnetic mapping conducted by the USGS (Sliter et al., 2009).

The G-882 is designed for operation from small vessels for shallow water surveys, as well as for the large survey vessels for deep tow applications (4,000 psi rating, telemetry over steel coax available to 10 km). Power may be supplied from a 24 to 30 VDC battery power or a 110/220 VAC power supply. The standard G-882 tow cable includes a Vectran strength member and can be built to up to 700 m (2,297 ft) (no telemetry required). The shipboard end of the tow cable is attached to a junction box or on-board cable. Output data is recorded on a computer with an RS-232 serial port.



**Figure 1-6. Geometrics G-882 Magnetometer**

### **1.6.3 Nearshore and Onshore Survey Operations**

To collect deep seismic data in water depths that are not accessible by the *R/V Langseth* (less than 25 m [82 ft]), seafloor geophones will be used. The currently proposed locations for the seafloor geophone lines surrounding DCCP are shown in Figure 1-7.

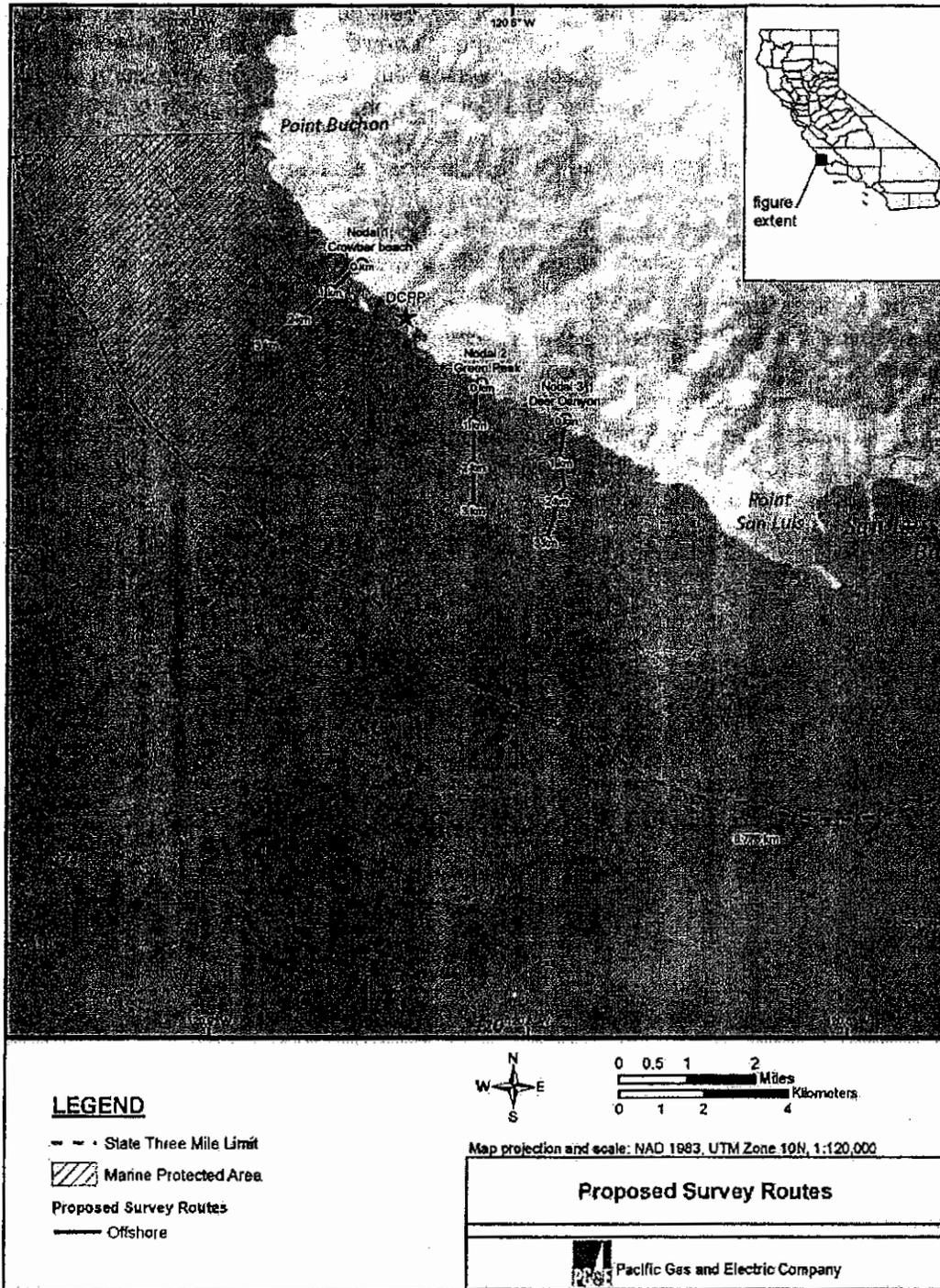


Figure 1-7. Proposed Marine Geophone Lines near Diablo Canyon Power Plant

One dozen (12) Fairfield Z700 marine nodes would be placed on the seafloor along two nearshore survey routes as a pilot test prior to the full deployment of 600 nodes scheduled for 2013. The northern route (Crowbar Beach) traverses the Point Buchon MPA north of DCP. The southern route (either Green Peak or Deer Canyon) is located south of DCP. The approximate locations of the proposed nodal routes are depicted above on Figure 1-7. Six nodes would be placed at 500 m (1,640 ft) intervals along each route for a total length of 3 km (1.8 miles). Maximum water depth ranges from 70 m (229.6 ft) (Crowbar) to 30 m (98.4 ft) (Deer Canyon). Marine nodes would be deployed using a vessel and (in some locations) divers and will be equipped with acoustic releases to facilitate recovery.

The seafloor equipment will be in place for the duration of the 2012 offshore 3D high energy seismic surveys plus deployment and recovery time. Node deployment will be closely coordinated with offshore survey operations to ensure survey activities are completed before the projected battery life of 45 days is exceeded. PG&E anticipates using a locally available vessel to deploy and retrieve the geophones. The vessel would be a maximum of 150 feet (50 meters) in length. The *M/V Uhl*, which is locally available, or a vessel of equivalent size and engine specification, is proposed for this purpose.

Figure 1-8 shows an example of a Fairfield Z700 nodal unit and Table 1-4 summarizes its features.



**Figure 1- 8. Fairfield Z700 Seafloor Geophone**

**Table 1- 4. Summary of Nearshore Geophone Features**

<u>Feature</u>	<u>Description</u>
Geophone Model	Fairfield Z700
Height of Individual Unit	15 cm (6 in)
Diameter of Individual Unit	38 cm (15 in)
Weight of Individual Unit	29 kg (65 lbs) when wet
Number of Units per String	Crowbar Beach: 6 Green Peak: 6 or Deer Canyon: 6
Length of Overall Receiver String (approximate)	Crowbar Beach: 3 km (1.9 mi) Green Peak: 3 km (1.9 mi) or Deer Canyon: 3 km (1.9 mi)

Onshore, a linear array of Zland nodals will be deployed along a single route on the Morro Strand to record onshore sound transmitted from the offshore air gun surveys. Route location is shown in Figure 1-10. Ninety nodes would be placed at 100 m (328 ft.) intervals along the Strand for a total route length of ~ 9 km (5.6 mi). The autonomous, nodal, cable-less

recording systems (Figure 1-9) would be deployed by foot into the soil adjacent to existing roads, trails and beaches. The nodal systems are carried in backpacks and pressed into the ground at each receiver point. Each nodal would be removed following completion of the data collection. PG&E estimates that the onshore receiver activities would be conducted over a 2 to 3-day period, concurrent with the offshore surveys.



\* Includes a 5 inch spike, is 6 inches high, 5 inches in diameter, and weighs 5 lbs.

**Figure 1-9. Example of Autonomous Wireless Nodal Land Recording System\***

**Deployment Operations.** PG&E estimates that the onshore receiver activities would be conducted over a 2 to 3-day period, concurrent with the offshore surveys.

## **1.7 PROJECT PERSONNEL AND EQUIPMENT**

### **1.7.1 Equipment Requirements**

The following vessels and equipment are being evaluated for use in the proposed offshore survey.

- *R/V Marcus G. Langseth*
  - Four hydrophone streamers;
  - Two air gun arrays;
  - Multi Beam Echo Sounder and Sub Bottom Profiler; gravity and magnetic sensors.
- Chase boat – *R/V Sea Trek* or equivalent
- Support vessel – *M/V Dolphin II* or equivalent
- *M/V Michael Uhl*
- Monitoring aircraft – Partenavia P68-OBS "Observer" (or equivalent aircraft)
- Marine geophones (approximately 12 geophones with acoustic releases)
- Canoe/kayak

The following is a preliminary estimate of anticipated vehicle and equipment needs for the proposed seismic surveys.

- 1 to 2 vans for data recording/processing.



### 1.7.2 Personnel Requirements

It is estimated that 89 personnel would be required for the proposed offshore survey program. Additional project-related personnel may also participate. The 89 personnel breakdown is as follows:

- *RV Marcus G. Langseth* crew: 55 (Based on Coast Guard registration)
- *RV Sea Trek* 12
- *M/V Dolphin II* 6
- *M/V Michael Uhl* crew: 5
- Support divers: 3
- Partenavia P68-OBS "Observer" 5
- Administrative/computer support: 3

Onshore survey operations are expected to require approximately 6 crew members. In addition, biological and cultural resource monitors would accompany each team in sensitive resource areas. These teams would operate at intervals of 0.8 to 4.8 km (0.5 to 3 mi) throughout the proposed Project area.

### 1.8 2012 PROJECT SCHEDULE

The proposed activities, including mobilization and demobilization, are expected to take 49.25 operational days to complete, assuming 24/7 operations. This estimate includes time for instrument deployment, profiling, instrument recovery, and demobilization. Mobilization will be initiated on October 15, with active air gun surveys taking place from November 1 through December 31, 2012.

Below is an estimated schedule for the Project using the *RV Langseth* as the primary survey vessel.

- Mobilization to Project Site - 6 days
- Initial Equipment Deployment - 3 days (offshore geophone deployment also)
- Pre-activity marine mammal surveys - 5 days (concurrent to equipment mobilization and deployment)
- Onshore geophone deployment - 2 - 3 days (concurrent with offshore deployment activities)
- Equipment Calibration and Sound Check - 5 days
- Seismic Survey - 23.25 days (Per the direction of the NMFS Box 4 will be surveyed first followed by Box 2)
  - Survey Box 4 (Survey area within Estero Bay) - 9.25 days
  - Survey Box 2 (Survey area from Estero Bay to offshore Santa Maria River Mouth) - 14 days
- Streamer and air gun preventative maintenance - 2 days
- Additional shutdowns (marine mammal presence, crew changes, and unanticipated weather delays) - 4 days
- Demobilization - 6 days

TOTAL: 49.25 days (for 24/7 operation). Note that the total of 49.25 days is based on adding the above non-concurrent tasks.

Placement of the onshore receiver lines would be completed prior to the start of offshore survey activities and would remain in place until the offshore activities can be completed.

## **1.9 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING**

During marine survey operations, key concerns would be the potential impacts to marine wildlife due to exposure to high sound levels associated with the use of the air guns, from direct collisions with the survey vessels, or from placement of geophones or cables directly on sensitive habitat or species. The proposed marine seismic survey activities have the potential to disturb or displace small numbers of marine mammals. These potential effects will not exceed what is defined in the 1994 amendments to the Marine Mammal Protection Act (MMPA) as "Level B" harassment (behavioral disturbance). The mitigation measures to be implemented during this survey are based on Level B harassment criteria using the sound level of 160 dB re 1  $\mu$ Pa (rms), and will, as such, minimize any potential risk of injury, such as damage to the auditory organs. No take by injury or death is likely given the nature of the activities and proposed monitoring and mitigation measures.

In addition, PG&E would implement a Marine Wildlife Contingency Plan (MWCP) which includes measures designed to reduce the potential impacts on marine wildlife, particularly marine mammals, from the proposed operations. This program would be implemented in compliance with measures developed in consultation with NMFS/FWS and would be based on anticipated exclusion and safety zones derived from modeling of the selected energy source levels. These exclusion and safety zones would be reviewed in context with Incidental Harassment Authorization (IHA) to be conducted by NMFS/FWS as part of the Project review under the Federal Endangered Species Act and MMPA.

### **1.9.1 High Energy Seismic Survey Impact Reduction Measures**

PG&E is utilizing acoustic models to predict sound levels associated with the air gun array, and this information was used to establish a safety zone and exclusion zone for marine mammals and turtles equating to the distances to the 160 to 180 dB re 1  $\mu$ Pa, respectively. The MWCP (see Appendix E) that PG&E plans to implement includes these zones to ensure protection of potential effected species. Measures that are also included in the plan are:

- PG&E conduct an aerial survey approximately 1 week prior to seismic survey to obtain pre-survey information on the numbers and distribution of marine mammals in the seismic survey area. Additionally weekly aerial surveys will be conducted during active air gun survey operations.
- NMFS-certified protected species observers (PSO) would be stationed on primary survey vessel, on the scout vessel, and on the aircraft (if necessary).
- A scout vessel would be deployed with PSO's to monitor marine wildlife within the survey exclusion and safety zone.
- If marine mammals or other sensitive wildlife are observed within or around the exclusion zone, avoidance measures will be taken including decreasing speed of vessel and a power down or shut down if necessary.

- Use of power up, ramp up, and shutdown procedures would be observed for air gun operations.
- Mitigation air gun would be used during survey turns outside of the 3D survey area as well as during shut down or standby periods.
- Passive Acoustic Monitoring (PAM) will be available to supplement visual monitoring in conditions of poor visibility or low lighting where it doesn't interfere with survey operations.
- If nighttime survey operations are located within the 40 m (131 ft) depth contour, PSO's will visually monitor the area forward the vessel with the aid of infrared goggles/binoculars and the forward looking infrared system available on the R/V Langseth. Mitigation measures, such as avoidance, power down, and/or shut down, would be implemented, if a sea otter is observed within the vessels' path.

In addition, the proposed survey timing (October 15 through December 31) has been developed in consideration of the generally lower presences of migrating and summer season whales in the Project area. PG&E proposes that the surveys are conducted on a 24/7 schedule to reduce overall length of operations thereby lessening impacts to commercial and recreational fisheries.

#### **1.9.2 Nearshore Geophone Deployment Impact Reduction Measures**

A team of diver-biologists have completed an initial survey of a 3 m (10 ft) wide corridor centered on the proposed geophone alignments and to determine the presence of any black abalone (*Haliotis cracherodii*). This survey did not identify any black abalone within the proposed corridor at this time. However, no more than two days prior to the placement of the geophone lines within the rocky inter- and shallow subtidal zone, a team of diver-biologists would resurvey these alignments to ensure no black abalone have moved into the corridors.

Deployment of geophone lines within rocky substrate in water depths of 3 m (10 ft) or less would be completed by divers who would pull the line from a boat and place each geophone to avoid any previously marked or observed black abalone. If a black abalone that had not been previously recorded is observed by the diver during geophone line deployment, the line would be placed at least 3 m (10 ft) away from that location. The location of all black abalone observed during the geophone line deployment would be recorded and included in a post-lay report.

#### **1.9.3 Onshore Geophysical Survey Impact Reduction Measures**

PG&E proposes the following measures to reduce impacts on sensitive wildlife during the onshore survey operations. A Worker Environmental Awareness Training Program (WEAP) would be prepared and presented to all personnel at the beginning of the project. This program was designed to discuss sensitive species and habitats, and why it is important to avoid disturbing them during project activities. A qualified biologist would perform pre-activity surveys along with daily monitoring to document sensitive species and compliance with avoidance measures. Seismic surveys would be designed to avoid California Department of Fish and Game (CDFG) sensitive species and the following federally listed species:

- Morro Bay kangaroo rat



- Morro shoulderband snail
- Western snowy plover
- California least tern
- California clapper rail



SAN LUIS OBISPO COUNTY

## DEPARTMENT OF PLANNING AND BUILDING

Promoting the wise use of land – Helping to build great communities

May 20, 2011

Mr. Loren Sharp  
Senior Director, Technical Services  
Diablo Canyon Power Plant  
Mail Code 104/6/603  
PO Box 56  
Avila Beach, California 93424

RE: Onshore Central Coastal California Seismic Imaging Project, San Luis Obispo County

Dear Mr. Sharp,

This letter will confirm that the County has reviewed the project description that you submitted to conduct an onshore deep seismic data collection survey for the purpose of assessing the potential impact of various fault zones surrounding the Diablo Canyon Power Plant.

The survey will be accomplished by using specialized technical vehicles that will drive along existing private or county roads. No new roads will be created for this purpose. Equipment from the trucks will be operated in 5-minute increments at each location to generate ground vibrations that create seismic (sound) waves which will be recorded by either a cable-based geophone recording system along roads or a cableless, portable nodal recording system in more remote areas. We understand that these portable nodal recording units are about the size of a coffee can and are pressed into the ground to record the data. Both the cabled and nodal systems will be removed following the conclusion of survey activities. No permanent facilities are needed.

The project is proposed to be temporary in nature, with no long-term, operational changes in land use. As mentioned already, the operations will be located along existing public and private access roadways. Biological and archaeological monitors will accompany each survey team so that any sensitive resource areas will be avoided. The project will comply with, or is exempt from, County vibration and noise standards and will operate between 7 am and 9 pm.

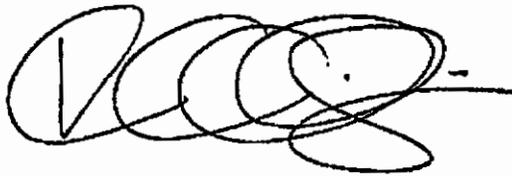
After detailed review of the project description submitted by Padre Associates, Inc. (Project No. 1002-2122, dated May 2011), the County has determined that the survey work to gather seismic data does not meet the definition of "Development" per Section 23.03.040 of the Coastal Zone Land Use Ordinance, and therefore, will not require a coastal development permit.

Mr. Loren Sharp  
May 20, 2011  
Page 2

As we have discussed previously, we understand that the offshore component of the seismic imaging project is still being developed. We continue to note that any work that is required on the beach may require a coastal development permit, and work offshore may need permits from other agencies.

If the onshore portion of the project changes in any manner from the project description that you provided, we would need to re-evaluate possible requirements for county permits. Please contact either Nancy Orton at 805/781-5008 or Ellen Carroll at 805/781-5028 should that occur.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kami Griffin', with a horizontal line extending to the right.

Kami Griffin, Assistant Director  
Department of Planning and Building



October 23, 2012

Cassidy Teufel  
Coastal Analyst, California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

**Re: Central Coastal Seismic Imaging Project—Request for permit denial**

Dear Mr. Teufel:

We are writing to supplement our comments of September 21 urging denial of the permit for PG&E's proposed Central Coastal Seismic Imaging Project.

Since we submitted those comments, the applicant has reconfigured the project. As the applicant has made no substantive changes in the project as originally proposed, the Sierra Club reiterates our opposition to your Commission issuing a Coastal Development Permit or a finding of consistency with the Coastal Zone Management Act.

Our objections on the basis of incomplete analysis of alternatives in the State Lands Commission's Environmental Impact Report (EIR) remain. For years, marine biologists have urged a transition from airgun technology to alternative means of geophysical survey due to the likely cumulative impacts of extremely loud sound pumped into the marine environment by airgun arrays, now ubiquitous in the world's oceans. (Weilgart, 2010).

Marine Biologist Dr. Lindy Weilgart's most recent comments on the viability of alternative technology with the potential for reduced or avoided impacts to coastal resources are attached.

We have grave concerns about impacts on marine mammals. Dr. Weilgart has noted that seismic noise is believed to contribute to some species' declines or lack of recovery (Weller et al. 2006a, 2006b; IWC 2007). The International Whaling Commission's Scientific Committee noted "...repeated and persistent acoustic insults [over] a large area...should be considered enough to cause population level impacts." (IWC 2005).

Dr. Weilgart further states that mitigation measures to safeguard whales against high noise exposures are invariably "very inadequate," largely due to the tendency of undersea noise to propagate far beyond the presumed impact boundaries of seismic surveys. Weilgart cites Madsen et al. (2006) which finds that "received levels can be as high at a distance of 12 km from

a seismic survey as they are at 2 km (in both cases >160 dB peak-to-peak). Received levels, as determined from acoustic tags on sperm whales, generally fell at distances of 1.4 to 6–8 km from the seismic survey, only to increase again at greater distances (Madsen et al. 2006).” Seismic airguns have damaged the ears of fish several kilometers from seismic surveys, with no evident recovery two months after exposure (McCauley et al. 2003).

The current project warrants a precautionary approach to marine mammal impacts, which has been the favored approach of this Commission in cases of uncertainty. In your Dec. 13, 2005, comments to the Marine Mammal Commission on the effects of anthropogenic sound on marine mammals, your Commission concluded:

Anthropogenic sound with the potential to harm marine life should be eliminated where possible or otherwise minimized (e.g., through source reduction and removal; geographic and seasonal restrictions).

Given the likelihood that anthropogenic sound may have significant impacts on marine mammals, the degree of uncertainty regarding the nature and extent of those impacts, and the need to consider cumulative and synergistic effects, a precautionary approach should be taken with respect to management of marine mammals.

Fundamentally, the primary goal of any management system must be to reduce or eliminate the intensity, and thus the potential for negative impacts, of noise sources by either not undertaking these activities to begin with, or through modifications to those activities (including the use of alternative, quieter technologies), and geographic and seasonal restrictions or exclusions.

The California Coastal Commission believes that protecting marine mammals, which it considers to be coastal resources, is important to this State... Under the Coastal Act, if there is uncertainty the Coastal Commission takes the position that the applicant must avoid or mitigate the impacts to a negligible level. If avoidance is not possible, or if mitigation is not possible, or if it is unknown whether mitigation will work, then the Coastal Commission may deny the project. In each case, the Coastal Commission applies the generally accepted legal principal that the applicant bears the burden of proof that the proposed project/action will *not* impact coastal resources.

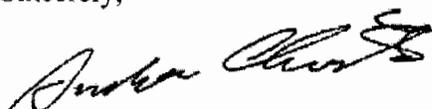
- Coastal Commission Comments to the Marine Mammal Commission on the Effects of Anthropogenic Sound on Marine Mammals  
Statement for The Report of the Advisory Committee on Acoustic Impacts on Marine Mammals , December 13, 2005

The project EIR admitted that there is insufficient research data to determine whether the project will have significant long-term impacts, but took the opposite of the precautionary approach, finding that the lack of research affirming long-term impacts was sufficient to support a finding of no significant long-term impacts. It is crucial in evaluating the proposed project that the Commission employs the precautionary approach rather than the approach of the EIR.

The uncertainty and the paucity of data also extends to the noise level that causes hearing loss in whales, which is based on the dubious practice of extrapolating the results of tests done on captive dolphins and applying them to baleen whales in the wild.

We urge the Commission to deny the permit for this project, which has the potential to cause significant short- and long-term harm to the central coast's marine wildlife, and encourage the applicant to fund the development of alternative technologies with the potential to significantly reduce or avoid impacts to coastal resources. Thank you for your consideration of these concerns.

Sincerely,



Andrew Christie  
Director, Santa Lucia Chapter of the Sierra Club



Amanda Wallner  
Organizer, Sierra Club California

- Attachment 1: Letter from Lindy Weilgart to Andrew Christie
- Attachment 2: State Lands Commission FEIR, *Alternatives: 5-15*
- Attachment 3: Sierra Club Letter to Coastal Commission, September 7, 2012
- Attachment 4: Sierra Club letter to Coastal Commission, September 21, 2012

IWC (International Whaling Commission). 2005. Report of the scientific committee. Annex K. Report of the Standing Working Group on environmental concerns. *J. Cetacean Res. Manag.* 7 (Suppl.): 267-305.

IWC (International Whaling Commission). 2007. Report of the scientific committee. Annex K. Report of the Standing Working Group on environmental concerns. *J. Cetacean Res. Manag.* 9 (Suppl.): 227-296.

Madsen, P.T., Johnson, M., Miller, P.J.O., Aguilar Soto, N., Lynch, J., and Tyack, P. 2006. Quantitative measures of air-gun pulses recorded on sperm whales (*Physeter macrocephalus*) using acoustic tags during controlled exposure experiments. *J. Acoust. Soc. Am.* 120: 2366-2379. doi:10.1121/1.2229287.

McCaulley, R. D., Fewtrell, J., and Popper, A. N. 2003. High intensity anthropogenic sound damages fish ears. *Journal of the Acoustical Society of America* 113: 638-642.

Weilgart, L.S. (ed) 2010. Report of the Workshop on Alternative Technologies to Seismic Airgun Surveys for Oil and Gas Exploration and their Potential for Reducing Impacts on Marine Mammals. Monterey, California, USA, 31st August - 1st September, 2009. *Okeanos - Foundation for the Sea, Auf der Marienhöhe 15, D-64297 Darmstadt.* 29+iii pp.

Weller, D.W., Rickards, S.H., Bradford, A.L., Burdin, A.M., and Brownell, R.L., Jr. 2006a. The influence of 1997 seismic surveys on the behavior of western gray whales off Sakhalin Island, Russia. Paper No. SC/58/E4 presented to the International Whaling Commission Scientific Committee, Cambridge, UK.

Weller, D.W., Tsidulko, G.A., Ivashchenko, Y.V., Burdin, A.M., and Brownell, R.L., Jr. 2006b. A re-evaluation of the influence of 2001 seismic surveys on western gray whales off Sakhalin Island, Russia. Paper No. SC/58/E5 presented to the International Whaling Commission Scientific Committee, Cambridge, U.K.



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September 21, 2012

Cassidy Teufel  
Coastal Analyst, California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

**Re: Central Coastal Seismic Imaging Project—Request for permit denial**

Dear Mr. Teufel:

We are writing to supplement our previous comments as more information has come to light about Pacific Gas and Electric Company's (PG&E) Central Coastal California Seismic Imaging Project. In light of the doubts voiced by geologists and seismologists about the degree of usefulness of the proposed project, we would ask PG&E and the Commission to examine the potential for a suite of less harmful alternative methods to determine the seismic risk surrounding Diablo Canyon Nuclear Power Plant (DCPP).

We believe that Central Coast residents deserve to know the magnitude of the seismic risks around DCPP, however we want to ensure that these tests are done right the first time. We share the concerns of many of our colleagues about whether the proposed test would answer key questions about earthquake risk at the plant. The current project may provide an incomplete picture of the seismic risk. It may give us more information on fault geometry, but potentially exclude other important considerations for determining risk, such as the movement of faults, the direction and speed of such movement, and the "sidetrack" potential of the Hogsri and Shoreline faults.

A combination of more sophisticated modeling, low-frequency testing, or use of new technology currently in development were not fully examined in the Environmental Impact Report as alternatives. As established at the August 9 meeting of the State Lands Commission, PG&E's alleged March 2015 deadline for submission of seismic data to the NRC is a deadline of convenience, not necessity, hence technology expected to become commercially available in the next few years should be considered a viable alternative.

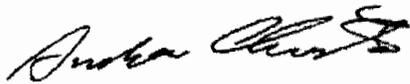
That is why we urge the Commission to deny the permit and consistency certification at this time and work with the applicant to fully examine alternatives that have the potential to produce more valuable data and greatly reduce impacts on the marine environment. Alternatively, we suggest the Commission issue a permit only for such portion of the project over which the Commission

may have jurisdiction that involves the study of onshore seismic areas, with no impacts to marine resources or mitigations for same required, while working with the applicant on the development of procedures that would yield useful data on offshore faults while minimizing harm to marine wildlife and environmentally sensitive areas.

Because we believe there are as yet too many unanswered questions regarding the geophysical data that the project would acquire, the long-term environmental impacts to marine resources and the effectiveness of any conceivable mitigation, which cannot be answered in a short timeframe, we urge the Commission to deny a permit and consistency certification for this project at this time.

Thank you for your attention to these concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Christie". The signature is written in a cursive, flowing style.

Andrew Christie, Director  
Santa Lucia Chapter of the Sierra Club



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September 7, 2012

To: Cassidy Teufel, Coastal Analyst

Re: Central Coastal Seismic Imaging Project

Dear Mr. Teufel,

As you and your colleagues prepare the October staff report for the CDP/federal consistency hearing on Pacific Gas and Electric Company's (PG&E) Central Coastal Seismic Imaging Project, we hope you will keep foremost in mind the requirements of Section 30230 and 30231 of The Coastal Act pertaining to the protection of marine and biological resources and biological productivity, and the mandate of Section 30240 to protect ESHA from any significant disruption of habitat values, and requiring that development in areas adjacent to environmentally sensitive habitat areas shall be sited and designed to prevent impacts which would significantly degrade those areas and shall be compatible with the continuance of habitat.

To that end, we wish to emphasize the following points for staff's consideration:

There are project alternatives with significantly less impact on coastal resources

In February 2012, the Alliance for Nuclear Responsibility (A4NR) submitted testimony from Dr. Douglas Hamilton on the proposed project to the California Public Utilities Commission (CPUC). Dr. Hamilton, an engineering geologist who participated in the seismic studies done by PG&E at the time the Diablo Canyon Nuclear Power Plant (DCNPP) was designed and built and continued to survey the site in PG&E's employ for some 20 years thereafter, pointed to areas of insufficient concentration in the proposed project. In his proposed decision, the CPUC Administrative Law Judge Robert Barnett wrote:

A PG&E witness testified that PG&E was investigating both the Diablo Cove Fault and the San Luis Range/Inferred Onshore Fault. Therefore, PG&E says we need not take any action other than approving this application in order to implement A4NR's recommendations. We agree with PG&E. PG&E has said it will address the concerns of Dr. Hamilton. We expect PG&E to do so.

Subsequently, on 8/20/12, the California State Lands Commission (CSLC) adopted a permit to allow PG&E's seismic testing without formal inclusion of Dr. Hamilton's concerns. Further, whether and to whatever extent PG&E may intend to address the concerns of Dr. Hamilton

pertaining to the addition of more useful locations in which to conduct its survey, they appear to have no intention of addressing his concerns regarding the deletion of less useful areas currently planned for study, which happen to coincide with the areas of the project's most significant impacts on coastal resources. Per Dr. Hamilton's testimony as delivered to the CPUC on 2/10/12:

A good deal of their planned work includes offshore and onshore geophysical programs that duplicate existing investigations and analyses completed by the USGS and others.... Nothing in the planned additional surveys, both onshore and offshore, offers any prospect for any result beyond marginal improvement to what is already known....

The CSLC permit decision suggests that if Dr. Hamilton's scope is not fully addressed then the survey, replete with its "significant and unavoidable impacts" on the Central Coast's marine wildlife as per the EIR will be 'marginal' at best and will need to be repeated, at worst.

The conversion of planned offshore surveys largely to onshore surveys is the best alternative to completely avoid or substantially reduce the project's significant impacts to marine wildlife. We have reason to believe, based on Dr. Hamilton's testimony at the PUC, that this alternative would be feasible for at least part of the survey area and we urge you to thoroughly explore this alternative.

Additionally, we urge Coastal staff to thoroughly explore the issue of the applicant's proposal to use an academic research vessel and technology vs. the alternative industrial vessel, technology and airgun array. Witnesses before the CSLC and CPUC have testified as to the advantages of the latter in data collection, reduced active test time and reduced impacts to coastal resources. The Coastal Commission should ensure that the survey will not yield inadequate data at the expense of unnecessary damage to coastal and marine resources.

#### Impacts to fisheries and invertebrates is understated and mitigation inadequate

Two Scandinavian studies (Lokkeborg and Sodal 1993, Engas et al 1996) found that seismic surveys resulted in 21-50 percent reductions in the catch of cod and haddock within an overall investigation area of 40 x 40 nautical miles, and a 45-70 percent reduction within the active seismic test area, with abundance and catch rates showing no sign of a return to previous levels five days after the end of the survey. Engas et al reported that fish reacted to the airguns up to 100km from the source.<sup>1</sup>

The EIR noted the small number of studies on the effects of high-intensity sound on marine life other than marine mammals. It went on to conclude that since significant, population-level impacts on fish and invertebrates in the wild has not been conclusively proven, no finding of significant impact could be made.

In order to make this finding, the EIR cited and dismissed studies finding massive acoustic trauma in fish and invertebrates exposed to airguns, also disrupting egg production and breeding behavior. Rather than extrapolating from these results to estimate impacts on members of species that may be repeatedly impacted as they flee from one the proposed project's survey box area to

another over 500 square miles of ocean, the EIR invariably opted for a best-case scenario, basing its conclusion of “no population-level effects” on the results of less conclusive studies. Ambiguity within the cited study does not trump the conclusive findings of the previous Scandinavian studies. The EIR concluded that “the pathological (mortality) zone for cephalopods is expected to be within a few meters of the seismic source,” without noting that there is no proposed monitoring or shut-down protocol for cephalopods, nor does it contemplate the population-level effects of several thousand or more breeding male and/or gravid female squid caught within a few meters of an airgun blast.

The EIR dismissed the impact on marine mammals of a primary prey species fleeing the area for more than 30 days. It based that finding on this single source:

With respect to squid as a food source, Scripps (2011) noted in its Incidental Harassment Authorization request to NMFS for a low-energy seismic survey that effects on invertebrates, including squid, would not affect food sources used by marine mammals.<sup>2</sup> [*emphasis added*]

PG&E’s proposed project is a high-energy survey, not a low-energy survey. Further, the Scripps Incidental Harassment Authorization request also found that “biochemical responses by marine invertebrates to acoustic stress...potentially could affect invertebrate populations by increasing mortality or reducing reproductive success.”<sup>3</sup> This finding was not cited in the EIR.

We urge the Commission not to repeat the unfounded assumptions of the EIR and mandate rigorous long-term monitoring and mitigation measures for fish and invertebrates as conditions of the permit.

We support the proposal of the San Luis Obispo Science and Ecosystem Alliance (SLOSEA) to require PG&E to fund a long-term impacts research study conducted by the California Collaborate Fisheries Research Program (CCFRP). The applicant’s offer to monitor the Pt. Buchon Marine Protected Area for “a period of one year not to exceed 2 years” after the completion of the survey is not sufficient to gauge long-term impacts on populations. We support SLOSEA’s suggestion of requiring PG&E to provide funding in support of exiting MPA monitoring protocols in view of the project’s potential to compromise the State of California’s baseline data for the MPA network, and additional PG&E-funded research for a period of 5-7 years of monitoring following the seismic testing as essential to understanding the project’s potential long-term impacts on slow-growing rockfish.

In view of the EIR’s admission of the lack of support in the scientific record for the conclusion that the project will have less than significant long-term impacts to biological resources, we note the well established role of national marine sanctuaries in protecting marine wildlife and conducting research programs that include process studies, prediction and modeling, allowing managers to use models to predict future changes and undertake appropriate preventative actions or restoration efforts. We suggest the Commission require as a condition of the permit that PG&E place \$2.4 million<sup>4</sup> into a dedicated fund to cover national marine sanctuary start-up costs, to be accessed at such time as national marine sanctuary status is secured for the Central Coast as per San Luis Obispo County’s General Plan.<sup>5</sup>

### The project does not comply with CEQA

In response to Coastal Commission staff comments on Draft EIR No. 758, the State Lands Commission asserted that the proposed San Onofre Nuclear Generating Station 3D seismic survey "would occur more than 170 nautical miles (nm) away and would therefore not be appropriate to include as part of the cumulative impact setting and analysis" for the Central Coastal survey (FEIR at II-82).

However, the National Science Foundation's environmental review prepared for the SONGS survey which the CSLC asserted is too distant to be considered in the Cumulative Analysis for the Central Coastal Seismic Imaging Project came to the opposite conclusion. The NSF's Draft Environmental Assessment of Marine Geophysical Surveys by the *R/V Marcus G. Langseth* for the Southern California Collaborative Offshore Geophysical Survey cites the "High Energy Seismic Survey (HESS) in the vicinity of the Diablo Canyon Power Plant" at 6.0 Cumulative Effects. In turn, the NSF Environmental Assessment for the Central Coastal California Seismic Imaging Project discusses the Southern California survey in its analysis of cumulative impacts (5.3, Other Seismic Survey Projects). In both documents, the respective seismic surveys are discussed separately as the first projects listed under the heading of Cumulative Impacts, prior to listing in chart form all non-seismic projects within the respective project areas which may also contribute to cumulative impacts.

In declining to analyze the impacts of the SONGS survey, the EIR contradicted its citation at 3.3 - Methods and Approach to the Cumulative Impacts Analysis: "Additionally, geographic boundaries and time periods used in a cumulative impact analysis should be based on all resources of concern and all actions that may contribute, along with Project impacts, to cumulative impacts (United States Environmental Protection Agency 1999)."

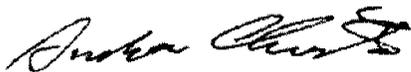
Coastal Commission staff was correct in recommending analysis of the cumulative impacts of both the SONGS survey and the DCNPP's ongoing impacts from entrainment and impingement of sea life and thermal discharge via the power plant's once-through cooling process in their comments on the Central Coastal Seismic Survey Draft EIR. The National Science Foundation was correct to site the SONGS survey in its analysis of cumulative impacts. The CSLC was incorrect in dismissing the contribution to cumulative impacts from once-through cooling of the DCNPP and asserting that the SONGS survey would "not be appropriate to include as part of the cumulative impact setting and analysis." The Coastal Commission's analysis should include these impacts and require that the applicant mitigate for them.

### The survey termination date has been unacceptably extended

The State Lands Commission, in allowing the termination date of the active survey period to extend from mid-December to the end of December allows the survey to overlap the gray whale migration past the Central Coast. In 2004, the Scientific Committee of the International Whaling Commission stated that it "views with great concern the impacts on large whales in critical habitats from exposure to seismic sound impulses," and recommends that "all seismic surveys in areas that could have significant adverse demographic consequences for large whales should be planned so as to be out of phase with the presence of whales."<sup>1</sup> We urge you to deny the time extension and require that any approved testing activities be completed before the start of the gray whale migration through the central coast.

Thank you for your attention to these concerns. If you have any questions, please call me at (805) 543-8717.

Sincerely,



Andrew Christie, Director  
Santa Lucia Chapter of the Sierra Club  
P.O. Box 15755  
San Luis Obispo, CA 93406

<sup>1</sup> Anthropogenic Noise and the Channel Islands National Marine Sanctuary, EDC, 9/28/04.

<sup>2</sup> Central Coastal CA Seismic Imaging Project EIR, July 2012, p. II-337.

<sup>3</sup> SIO IHA Application for the Western Tropical Pacific, 2011, "Physiological Effects," p. 47.

<sup>4</sup> National Marine Sanctuary average first-year cost as estimated by the Superintendent of The Gulf of the Farallones National Marine Sanctuary, 9/6/12.

<sup>5</sup> Policy BR-7.2 of the San Luis Obispo County Conservation and Open Space Element seeks "to secure permanent protection and management of the County's ecologically and economically significant marine resources using the National Marine Sanctuary, National Estuary, or other programs and legislation as vehicles for protection and management."



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Sept. 4, 2012

To: Commissioner Florio  
Robert Barnett, ALJ

RE: A.10-01-014 Proposed Decision on PG&E Central Coastal 3D Seismic Survey -  
Request for Public Participation Hearing

Dear Administrative Law Judge Barnett and Assigned Commissioner Florio,

The Santa Lucia Chapter of the Sierra Club, representing 2,000 residents of San Luis Obispo County, would like to request that the CPUC hold a Public Participation Hearing in San Luis Obispo County before the adoption of Proposed Decision for A. 10-01-014, issued 8/14/12.

The Proposed Decision states:

A PG&E witness testified that PG&E was investigating both the Diablo Cove Fault and the San Luis Range/Inferred Onshore Fault. Therefore, PG&E says we need not take any action other than approving this application in order to implement A4NR's recommendations. We agree with PG&E. PG&E has said it will address the concerns of Dr. Hamilton. We expect PG&E to do so.

We are concerned that on 8/20/12, the California State Lands Commission adopted a permit to allow PG&E's seismic testing without formal inclusion of Dr. Hamilton's concerns. Further, whether PG&E intends to address the concerns of Dr. Hamilton pertaining to the addition of more useful locations in which to conduct the surveys, they appear to have no intention of addressing his concerns regarding the deletion of less useful areas currently planned for study, per Dr. Hamilton's testimony as delivered to you on 2/10/12:

A good deal of their planned work includes offshore and onshore geophysical programs that duplicate existing investigations and analyses completed by the USGS and others.... Nothing in the planned additional surveys, both onshore and offshore, offers any prospect for any result beyond marginal improvement to what is already known....

The assumption in the CSLC's permit decision is that if Dr. Hamilton's scope is not fully addressed and/or if PG&E's proposed survey vessel provides less than rigorous survey techniques or inadequate data collection, then the survey, replete with "significant and unavoidable impacts" on the Central Coast's marine wildlife as per the EIR, will need to be repeated.

The fisherman and local businesses in our community which depend on marine life fear for their livelihoods if these tests proceed as planned. The Chumash community fear for their sacred grounds.

The CPUC must hear the concerns of the community before passing on costs of \$64 million or more in which we are asked to pay for destructive testing that will impact the natural resources of the Central Coast. Please come to San Luis Obispo and allow time to hear our concerns before making this decision.

Thank you for your attention to these concerns,

A handwritten signature in black ink, appearing to read "Andrew Christie". The signature is fluid and cursive, with a large initial "A" and "C".

Andrew Christie  
Director, Santa Lucia Chapter of the Sierra Club

cc: [public.advisor@cpuc.ca.gov](mailto:public.advisor@cpuc.ca.gov)

# OCEAN CONSERVATION RESEARCH



*Science and technology serving the sea*

October 10, 2012

Michael Payne, Chief  
Permits and Conservation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, MD 20910-3225

Re: PG&E/Lamont Doherty California Central Coast seismic imaging project.

Dear Mr. Payne,

We are concerned that the proposed seismic survey of the geological profile of the areas offshore from the Diablo Canyon nuclear power plant are poorly planned and thus will be unnecessarily disruptive to marine life. While we do not believe that the seismic surveys will immediately destroy all marine life in the region as some opponents fear, it is well known that even shipping noise (without seismic airgun signals) increases stress levels in whales<sup>1</sup>. We also know that airgun pulse exposure levels significantly lower than the 160dB "safety zone" will disrupt migration patterns – with the potential to compromise reproductive success of whales<sup>2</sup>. Additionally there is ample evidence that seismic surveys disrupt foraging in sperm whales,<sup>3</sup> and interrupt the vocalizations<sup>4</sup> and "spook"<sup>5</sup> Bowhead whales.<sup>6</sup>

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<sup>1</sup> Rosalind M. Rolland, Susan E. Parks, Kathleen E. Hunt, Manuel Castellote, Peter J. Corkeron, Douglas P. Nowacek, Samuel K. Wasser and Scott D. Kraus (2012) "Evidence that ship noise increases stress in right whales" Proc. R. Soc. B doi:10.1098/rspb.2011.2429

<sup>2</sup> Castellote, M. Clark, C.W., Lammers M.O. "Potential negative effects in the reproduction and survival on fin whales (*Balaenoptera physalus*) by shipping and airgun noise." International Whaling Commission report SC/62/E3 - 2010

<sup>3</sup> Jochens, A., D. et.al . 2008. Sperm whale seismic study in the Gulf of Mexico: Synthesis report. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2008-006. 341 pp.

<sup>4</sup> Blackwell, S. B., Nations, C.S.S., McDonald, T.L., Greene, C.L., Thode, A., Macrander, M.A. "Effects of sounds from seismic exploration on the calling behavior of bowhead whales. (A) 2008 J. Acoust. Soc. Am. V124: 4

<sup>5</sup> Richardson, J.W., Wursig, B., Greene, C.W. "Reactions of bowhead whales, *Balaena mysticetus* to seismic exploration in the Canadian Beaufort Sea" J.Acoust. Soc. Am 79 (4), 1986

<sup>6</sup> While sperm whales are not common in the area, and Bowheads are an Arctic species, it stands to reason that these species could serve proxy for other mysticetes and odontocetes.

We also know that seismic surveys have agonistic effects on fish species<sup>7</sup>, can cause intermediate to long-term damage to fish hearing mechanisms<sup>8</sup>, damage fish eggs, larvae and fry<sup>9</sup>, and can also damage<sup>10</sup> and kill marine invertebrates<sup>11</sup>.

All of these citations point to the fact that while seismic surveys may not always induce these agonistic, damaging, or deadly interactions, they should be avoided. This is particularly in light of the scheduling of the surveys that overlap the fall migration of Eastern Pacific gray whales.

It is an unfortunate happenstance that Table 4-1 “Estimated Densities of Marine Mammal Species Within the 160 dB Seismic Survey Safety Zone by Survey Area” in the Draft Environmental Assessment<sup>12</sup> does not have NOAA density estimations for this species, and the “Padre Density” Transit and Transects were taken in December through February when most of the whales have reached their southern destination in the lagoons of Baja California. Had these surveys taken place in November and December – to coincide with the proposed seismic survey operations, the densities would likely have been much higher. That many of the gray whales migrating past the subject area in the late fall are also pregnant females highlights the level of poor planning in this aspect of the larger program.

The objective of the entire program is to determine if the level of seismic instability in and around the Diablo Canyon Nuclear Power Plant puts the plant at risk of catastrophic failure in the event of an earthquake. We believe that the proposed marine seismic airgun surveys need to be weighed in terms of a balance of harms. Should there be a large scale seismic event the potential for loss of life and habitat is extremely high, but we believe that if better planned and staged, the geological evidence substantiating the risks could be determined without needing to survey such large areas – or even any of the marine geological profile off of Diablo Canyon.

Bearing in mind that I am not a geophysicist, and strategizing the sequence of the entire program is not under the purview of the National Marine Fisheries Service I only offer the following argument to substantiate our opinion that any “Incidental Harassment” or “Incidental Take” permits should be denied until it is determined that the information assuring safe operation on the power plant could only be secured by way of towed airgun seismic surveys.

<sup>7</sup> Engås, A. S. Løkkeborg, E. Ona, and A. V. Soldal. (1996). “Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*)”. Can. J. Fish. Aquat. Sci. 53:2238-2249.

<sup>8</sup> McCauley, R. D., Fewtrell, J. & Popper, A. N. (2003). High intensity anthropogenic sound damages fish ears. Journal of the Acoustical Society of America 113, 638- 642

<sup>9</sup> J. Dalen and G.M. Knutsen, “Scaring Effects on Fish and Harmful Effects on Eggs, Larvae, and Fry by Offshore Seismic Explorations” in H.M. Merklinger, Progress in Underwater Acoustics 93-102 (1987);

<sup>10</sup> Michel André et.al. 2011. “Low-frequency sounds induce acoustic trauma in cephalopods. Frontiers in Ecology and the Environment” 9: 489–493. <http://dx.doi.org/10.1890/100124>

<sup>11</sup> A. Guerra, A.F. González and F. Rocha (2004) “A review of the records of giant squid in the north-eastern Atlantic and severe injuries in *Architeuthis dux* stranded after acoustic explorations” International Council for the Exploration of the Sea CC:29

<sup>12</sup> Padre Associates “Draft environmental assessment of marine geophysical surveys by the R/V Marcus G. Langseth for the central coastal California seismic imaging project” June 2012 p. 117-119.

I understand that there is substantial data on the Shoreline, Hosgri, Los Osos, and San Luis Bay faults that may already preclude continued operation of the power plant. I understand that the first three of these are not seafloor faults, could be surveyed from terrestrial vibroseis, and modeled in greater detail to assure that the risk-threshold for safe plant operation is not already exceeded by what we can know without obtaining offshore data.

If further data is needed it is possible that a general profile of the entire area could be derived from "Full Tensor Gravity Gradiometry" (FTG)<sup>13</sup> surveys. These might be conducted from airborne<sup>14</sup> or marine towed<sup>15</sup> instruments. If these surveys did not yield the level of detail required for a clear decision, they would likely help focus in on where seismic excitation would yield the most productive data.

And if seismic excitation is still indicated, this setting would be an opportune site for the use of marine vibroseis or other less impulsive energy source.<sup>16</sup> These alternate technologies are non-impulsive and distribute the excitation signal over a longer time domain, and while they may be behaviorally disruptive, they typically would not exceed the current acoustical exposure mitigation thresholds found in the Marine Mammal Protection Act (MMPA).

Furthermore, the sequence of these events could be crafted to assure that any required airgun surveys would not take place when south-bound pregnant gray whales or the north-bound pairs with neonates will not be exposed to unnecessary acoustic trauma.

Of course none of these alternatives will be employed if NMFS issues permits to proceed with the current plan. For this reason we ask that you deny the Incidental Harassment and Incidental Take permits requested by PG&E for the marine seismic surveys off of California's Central Coast.

Sincerely,



Michael Stocker

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<sup>13</sup> <http://www.arkex.com/bluecube.html>

<sup>14</sup> [http://www.bellgeo.com/Air\\_FTG/Air\\_FTG.html](http://www.bellgeo.com/Air_FTG/Air_FTG.html)

<sup>15</sup> [http://www.bellgeo.com/Marine\\_FTG/Marine\\_FTG\\_introduction.html](http://www.bellgeo.com/Marine_FTG/Marine_FTG_introduction.html)

<sup>16</sup> Weilgart, L.S. (ed) 2010. Report of the Workshop on Alternative Technologies to Seismic Airgun Surveys for Oil and Gas Exploration and their Potential for Reducing Impacts on Marine Mammals. Monterey, California, USA, 31st August – 1st September, 2009. Okeanos - Foundation for the Sea, Auf der Marienhöhe 15, D-64297 Darmstadt. 29+iii pp. Available from [http://www.sound-in-the-sea.org/download/AirgunAlt2010\\_cn.pdf](http://www.sound-in-the-sea.org/download/AirgunAlt2010_cn.pdf)



**CALIFORNIA GRAY WHALE COALITION**  
**PROTECTING THE MOST ANCIENT BALEEN WHALE ALIVE TODAY**

P. O. Box 50939 Palo Alto, CA 94303 Ph: 650 322 4729

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Cassidy Teufel  
45 Fremont Street  
Suite 2000  
San Francisco, Ca.

9/10/2012

Cassidy,

Enclosed you will find our submission along with documents supporting photographic identification of Western Gray's, the ACS/LA census data for December 2007-2011 and an article from the International Society for Comparative Psychology (emailed only – it's a big one) on the effects of noise on marine mammals and other animal.

Thank you for taking the time on the phone with me today and I hope I can make the meeting on the 25<sup>th</sup> with Sue. She asked me to confirm a time that works good for you. You can confirm with me by email or phone whichever works best for you.

Please feel free to contact me or Sue if you would like any information clarified or would like more data on any issue of this.

Sincerely

*Hunter Kilpatrick*

Hunter Kilpatrick  
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# CALIFORNIA GRAY WHALE COALITION

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9/10/2012

### SUBMISSION TO CALIFORNIA COASTAL COMMISSION ON P G & E HESS.

The California Gray Whale Coalition, representing more than 130 organisations along the west coast of North America, including many whale watching companies and environmental organisations, strongly objects to the proposed High Energy Project on the following grounds:-

#### MMPA definition of "Harassment"

- Level A Harassment- has the potential to injure a marine mammal or marine mammal stock in the wild.
- Level B Harassment- has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioural patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding or sheltering.

#### ESA definition of Harm

- Any act which actually kills or injures.
- \* Includes significant habitat modification or degradation which kills or injures by significantly impairing essential behavioural patterns, including breeding, migrating, feeding.

The Coalition believes the proposed study constitutes Level A, Level B Harassment and Harm as defined by the MMPA and ESA.

### **LEVEL B TAKE VERSUS LEVEL A**

Given the fact that Temporary Threshold Shift (TTS) and Permanent Threshold Shifts (PTS) can ONLY be determined by necropsies, it cannot be scientifically acceptable to claim that blasting these levels of noise at migrating Gray whales will not cause damage.

The Coalition has not been able to determine any post project surveys for any species. Nor is there any indication of how post project surveys (assuming any) would be undertaken; the parameters of such surveys; indications of problems, methodology, mortality, stranding, calf mortality, reproduction failure, stress and immune disorders; disruption of communication etc. etc. Without post project surveys which are capable of identifying mortality or injuries, impairment of essential behavioural patterns, the determination of Level B Harassment is optimistic.

Noise impacts on Gray whales have been well researched and there is evidence that the whales are sensitive to low, medium and high frequency. As pregnant gray whales lead the migration procession and are well documented as present in the area during November and December, the ramifications of allowing this HESS to take place at this time are likely to be disastrous.

Calves born along the migration route face significant threats as detailed by Dr. Wayne Perryman,<sup>1</sup> SWFSC, La Jolla.

*“If a calf is born along the migration route, it will be required to migrate instead of just hanging around. This would cause it to burn more energy. Calves are born skinny with little or no insulative blubber layer so they will burn up some energy just keeping warm. The water in the lagoons is not only warm, but the salinity is very high. Calves can float easily to the surface in the lagoon’s high-density water, while calves born in the lower salinity waters along the California coast may have to swim to the surface, and the higher waves can make them more vulnerable to drowning. Probably the most important disadvantage of being born along the migration route is that killer whales can find the calves. There are normally no killer whales in the lagoons so it is a safer place if you are a calf.”*

A report on Climate Change Impacts<sup>2</sup> (2010) concurs:-

*Warming sea temperature likely will result in a shift north of breeding areas. Gray whales (*Eschrichtius robustus*) for example, appear to be giving birth as far north as Monterey Bay expanding north from lagoons of Baja, Mexico. Giving birth outside the sheltered Baja calving lagoons presents greater risk of storm stress to newborn calves as well as increased risk of predation by killer whales and large sharks.*

Whilst last season’s cow calf count was demonstrably higher than previous four seasons, one good season cannot possibly be described as a “recovery”. With massive changes taking place in the Gray Whales primary feeding grounds and habitat (Arctic and sub-Arctic) combined with whales migrating further north in search of prey, their status can only be described as vulnerable.

The Precautionary Principle must be paramount in any management decisions.

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<sup>1</sup> Dr Wayne Perryman, interview Journey North.

<sup>2</sup> Report of Joint Working Group of the Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils Climate Change Impacts 2010.

## WESTERN PACIFIC GRAY WHALE.

- The NMFS Federal Register Notice and all previous studies have completely failed to take into account the presence of the highly endangered Western Pacific Gray Whales in the area. The number of these whales appears to be increasing (paper attached) and it is not possible to predict when and where they may be sighted.
- Because of the difficulty of identifying Western and Eastern North Pacific Gray Whales, and the fact that the studies will be conducted 24 hours a day, 7 days a week, it will be impossible to detect Western Pacific Gray whales. at night.
- The highly endangered status of the Western Pacific Gray Whale ensures there is no PBR level.

## EASTERN NORTH PACIFIC GRAY WHALE.

The disregard for the ENP Gray Whale is of major concern to the Coalition. A number of important points need to be raised.

### **No recent population assessment of the ENP Gray whale is currently available.**

According to the Draft SAR 2012, "*the most recent estimate of abundance is from 2006/2007 southbound survey or 19,126 whales. The most recent southbound counts were made during 2007/2008, 2009/2010 and 2010/2011 surveys from which abundance estimates are not yet available.*"

This is an outrageous and unprecedented situation. It is now 6 years since NMFS has made available a current population figure. There is no precedent in the last 23 years of population estimates that a current figure has not been made available for six years. In spite of the lack of any current estimate, the following figures are quoted in various documents.

### **Population numbers**

1. **19,126 Gray whales** According to the Federal Register Notice relevant to HESS.
2. **17,752 gray whales** - Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Shallow Hazards Survey in the Chukchi Sea, Alaska  
A Notice by the National Oceanic and Atmospheric Administration on 08/03/2011
3. Indeterminate number. **Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Seismic Survey in the Beaufort Sea, Alaska** -  
A Notice by the National Oceanic and Atmospheric Administration on 07/06/2012
4. 19,126 Gray whales

Takes of Marine Mammals Incidental to Specified Activities: taking Marine Mammals Incidental to a Marine Geophysical Survey in the Arctic Ocean, September- October 2011.

A Notice by the National Oceanic and Atmospheric Administration on 07/14/2011.

5. 18,017 gray whales

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to an Exploration Drilling Program Near Camden Bay, Beaufort Sea, AK;

A Notice by the National Oceanic and Atmospheric Administration on 11/07/2011

6. 18,017 Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to an Exploration Drilling Program in the Chukchi Sea, Alaska

A Notice by the National Oceanic and Atmospheric Administration on 11/09/2011

Interestingly, the NOAA Office of Protected Resources Gray whale page cites the following under population:-

*The most recent abundance estimates are based on counts made during the 1997/98, 2000/01, and 2001/02 southbound migrations, and range from about 18,000-30,000 animals.*

The Coalition believes it is abundantly obvious that NMFS plucks figures out of the air to suit particular projects and that until such time as a current population estimate is available, no project should be permitted.

#### **Potential Biological Removal (PBR)**

The Potential Biological Removal (PBR) level is the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

The number of Gray Whales which can be removed from the stock is a key issue and the PBR set by NMFS has been a matter of controversy for many years given the changes in methodology; changes in population assessments; lack of current data and research into the implications of setting high PBR at a time when the population suffered a major population crash in 1999,2000..

Inexplicably, NMFS has set the PBR level in 2012, according to the Draft SAR 2012, at 558 animals based on a minimum population of 18,017. This is a massive increase from 360 animals in the previous Draft SAR (2010) when the stock, according to the report was at exactly the same number, that is a minimum population of 18,017.

There is no explanation as to why an extra 198 animals can be taken or why NMFS continues to use a six year old population estimate as the basis for the calculation.

The Coalition believes that there is considerable potential for Level A Harassment and that Level B take as outlined in the PG& E HESS may well translate into mortality. As an exercise, the Coalition has combined all known takes (A and B) demonstrating the PBR of 558 animals is entirely reachable.

Projected take – PG & E	97 whales	LEVEL B
IWC quota for Chukotka	140	LEVEL A
Beaufort Sea Take	3	LEVEL B
Chukchi Take (2)	46	LEVEL B
Arctic Ocean Take (3)	71	LEVEL B
Chukchi Take (4)	30	LEVEL B
Beaufort Sea Take (5)	30	LEVEL B
Chukchi Take (6)	46	LEVEL B
 TOTAL	 463 WHALES.	

It should be noted that figures in the Draft SAR for 2012 are not current for incidental mortality due to commercial fisheries, human caused deaths and serious injuries from fishery related sources (2006-2010), nor are stranding and entanglements (2005-2009) and nor the summary of Gray whale serious injuries and deaths attributed to vessel strikes for the period 2006-2010.

However, according to the Draft SAR 2012, based on 2006-2010 data, the estimated annual level of human caused mortality and serious injury and ship strikes total 128 whales per year.

**THUS MAKING A TOTAL OF 591 – EXCEEDING THE PBR.**

It must be stressed that the figures given can only be described as “rubbery” as without current data and current population estimates, not only has NMFS ignored its statutory responsibilities in monitoring the ENP gray whale population but the Agency cannot provide accurate and current statistics of human caused mortality.

It must be further stressed that the Coalition has combined Level A and Level B figures as an example of inappropriate management. The PBR level does not specify how many Level B harassments are acceptable nor is there any protocol which would determine the fate of animals exposed to Level B harassment. A significant risk factor is ignored in PBR level calculations.

Further, at the Scientific Workshop which the Coalition ran over two days in late March, 2012, Dr Lance Barrett-Lennard and Craig Matkin, transient orca experts, gave evidence that the predation on Gray whale calves and juveniles fluctuates between 8-60% annually depending on the numbers of calves.

This predation rate is not taken into account in any PBR. The failure to include predation was a key criticism of the workshop participants along with the failure of NMFS to

provide current population assessments.

Given the failures outlined above, there can be no scientifically acceptable figure which demonstrates an optimum sustainable population.

To allow a Level B take of 97 animals in a scenario with such paucity of adequate and current scientific information is simply unacceptable. Given that the timing of the study co-incides with the lead migration of heavily pregnant females and newborn young, the Coalition considers that a Level A take is more appropriate given the risks involved in exposing these animals to high frequency sonar.

#### PACIFIC FEEDING AGGREGATION.

Again, the documents fail to consider the Pacific Feeding Aggregation and the potential for some of these animals to be in the study area in November and December.

According to the Draft SAR 2012, “satellite tagging studies between 3 September and 4 December 2009 off Oregon and California provide movement data for whales considered to be part of the PCFG (Mate et al 2010). Duration of tag attachment differed between individuals, with some whales remaining in relatively small areas within the larger PCFG seasonal range and others traveling more widely. All six individuals whose tags continued to transmit through the southbound migration utilized the wintering area within and adjacent to Laguna Ojo de Liebre.”

The importance and vulnerability of this feeding aggregation is highlighted in the following excerpt:-

*“Whales that utilize the northern feeding grounds migrate through the areas occupied by the southern feeding group, suggesting that whales from both known feeding grounds may migrate together the remainder of the way to the winter calving grounds (Darling 1984). The peak time of migrants passing through the southern feeding area is December (Darling 1984). Thus, the timing of fertilization coincides with when whales from different feeding grounds become intermingled during their southern migration. This pattern indicates the strong potential for interbreeding regardless of any substructuring that may exist during the summer, or on the winter calving grounds. Despite the presence of nuclear gene flow between whales from the southern feeding group and the rest of the population, this group still represents a separate management unit that warrants separate consideration with respect to the proposed resumption of traditional whaling. The presence of long-term site fidelity to this area, that is passed on from mothers to offspring, indicates that these whales represent a seasonal subpopulation. Thus, detrimental impacts (i.e. “takes”) to these whales will not have a “random” impact on the population at large, but will instead primarily impact these matriline specifically. As a result, the resulting effect on this local subpopulation could be far greater than would be expected under the assumption of a single, unstructured population. Potential impacts could include the loss of knowledge of these feeding areas from this population, and localized extirpation. For example, if the whales that currently show this site fidelity*

are removed, then this information will be lost, and thus these whales will not likely be replaced by others from the larger population, resulting in localized extirpation. Indeed, the recognition of such seasonal subpopulations as separate management units is recommended, and common, for baleen whales (e.g. Dizon and Perrin, 1997). <sup>3</sup>

#### ANNUAL MIGRATION CONFLICTS WITH STUDY DATES.

The Coalition submits data from the American Cetacean Society which demonstrates that Gray whales are in the project area in December. The migration is led by heavily pregnant gray whales with many calves being born offshore according to NMFS.

As well, the Coalition has canvassed whale watching companies who are members, up and down the coast and we can provide statutory declarations, if necessary, which demonstrate that Gray whales are often seen in the area as early as October.

#### **NOISE ISSUES.**

There are no comments about integrating all the exposures from 2 x 9 seismic airgun arrays, four vessels, multi-beam echosounder and sub-bottom profiler, and noise from aerial surveys. Thus the cumulative impact of the noise stressors has been ignored. Other threats are also important in evaluating the load.

*"The following threats will almost certainly contribute in one way or another to a reduction in the condition of individuals (i.e., an increase in the "allostatic load"), which might, among other things, make them more susceptible to other potential stressors, including noise. As mentioned above, a reduction in the overall condition can also influence the psychological outlook of an animal. Although acting primarily on individuals, the impacts of these stressors may filter up to the population level if they affect an individual's survival or fecundity. These threats include:*

- *climate change and other ecosystem-wide change;*
- *habitat loss or degradation through coastal and offshore development, fishery activity (including due to a reduction in available prey), inland development (that results in material washing downriver either immediately or over an extended period as a consequence of a change in land-use, such as clearing forests), etc.;*
- *disease;*
- *toxic algal blooms ; and*
- *contaminants (especially adrenocorticotoxic contaminants <sup>4</sup>"*

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<sup>3</sup> 1 Substructuring of mitochondrial, but not nuclear, markers in the 2 "southern feeding group" of eastern North Pacific gray whales

3 4 ANNA M. D'INTINO<sup>1</sup>, JAMES D. DARLING<sup>2</sup>, JORGE URBÁN-RAMÍREZ<sup>3</sup>, AND TIMOTHY R. FRASIER\*<sup>1</sup>

<sup>4</sup> *International Journal of Comparative Psychology*, 2007, 20, 274-316. Copyright 2007 by the

## GEOACOUSTIC PARAMETERS.

These parameters are constantly changing. Modeling is only capable of limited understanding of these changes. Different tides, seawater temperature, seabed alterations, weather and other factors all have the capacity to bring about major changes from day to day.

Thermoclines and ducting impact the geoacoustic parameters allowing noise to travel much further than calculated by modeling.

The received levels of noise impacting cetacea must be taken into account. Given the sensitivity of Gray whales and other mysticetes whales to noise, the current analysis is deficient and fails to take into account major issues relative to underwater noise.

*Presently, the vocalization source level estimates reported in the review literature on mysticetes cover a 60 dB range between about 130 and 190 dB re 1 $\mu$ Pa (see e.g., Wartzok & Ketten, 1999);*

*A variety of different behavioral responses including changes in acoustic behavior have been observed from mysticetes in response to the presence of specific sounds, or to stimuli (such as sea vessels) paired with specific sounds. These include changes in movement patterns and diving behavior; approach or avoidance responses; alterations in respiratory patterns; changes in aerial behaviors such as breaching; and modifications of acoustic behavior including call rate, structure, and duration (see Richardson et al. 1995; Miller et al., 2000). Historically, the behavior of mysticetes has been difficult to observe, and the tools for measuring responses have been somewhat crude, including theodolite tracks measured from shore stations and visual and acoustic observations made by shipboard observers. As a result, while significant behavioral changes to sound sources have been detected, it is nearly certain that more subtle responses to less salient stimuli have been overlooked (see discussion in Tyack et al., 2003/4). While gross measures of behavioral change may be appropriate for identifying strong, suprathreshold responses, inferences about hearing capabilities are improved by assessing the lower limits of responsivity to auditory cues. Despite the constraints imposed by limited response detection capabilities, the reliable responses that have been measured from mysticetes to date have served to identify sound types and levels that are convincingly detectable by individuals of different species. For example, such studies have shown that some mysticetes respond to sounds as low in frequency as 20 Hz, as high in frequency as 28 kHz, and as low in level as ~84 dB re 1  $\mu$ Pa (or ~6 dB above ambient noise) (see reviews in*

*Richardson, 1995; see also Lucifredi & Stein,*

*Two studies in particular have intentionally explored features of auditory function in mysticetes. In a pilot study, Dahlheim and Ljungblad (1990) attempted to determine the feasibility of conducting hearing assessments on gray whales swimming through a channel in Laguna San Ignacio, in Baja California. The investigators placed a bottom mounted transducer in a region of the channel with known physical characteristics of the water column and bottom topography and calibrated the tonal stimuli to be used in the study at various positions surrounding the sound source. As whales moved through the study area, a 1-second signal of pre-determined frequency and level was played from the transducer. Control exposures, in which no sound was presented to focal individuals, were also conducted. Whale behavior was measured from two independent observation stations before, during, and immediately after each exposure. Sound frequencies tested ranged from 200 to 2500 Hz, and startle responses were documented to stimuli between 100 and 1500 Hz at received exposure levels of 100 to 135 dB re 1  $\mu$ Pa.*

*Using a different approach, Frankel, Mobley and Herman (1995) derived response thresholds for playbacks of social and synthetic sounds to humpback whales off the coast of Hawaii. The sound levels received by individual whales during the playbacks were modeled and then verified with empirical transmission loss measurements. The investigators reported behavioral responses measured from shore stations to social sounds as low as 102 dB re 1  $\mu$ Pa and to synthetic sounds as low as 106 dB re 1  $\mu$ Pa. While the relatively overt behavioral responses measured in this study likely underestimate absolute hearing sensitivity to the playback stimuli, this titration of stimulus levels moves closer to revealing true sound detection capabilities in whales.*

*It is worth pointing out that for the purposes of hearing assessment—where response magnitude is likely to decline with stimulus saliency—the observation of subtle, biologically insignificant but reliable responses to low amplitude sounds will be critical in closing the gap between estimation of response thresholds and absolute auditory thresholds.*

*Changes in acoustic behavior as a function of different noise conditions may potentially include differences in the level, rate, duration, and frequency bandwidth of vocalizations; these differences can in turn be related to auditory phenomena such as detection, masking, and hearing loss.*

*Aspects of motivation also come into play when interpreting behavioral responses to sound, for example, it may be quite difficult to elicit a response from whales that are engaged in active feeding, social interactions, or mating, but much easier to elicit responses*

*from individual whales that are traveling or resting quietly (see Richardson, 1995).<sup>5</sup>*

## EXCERPTS

**Coastal Commission Comments on the Effects of Anthropogenic Sound on Marine Mammals Statement for The Report of the Advisory Committee on Acoustic Impacts on Marine Mammals to the Marine Mammal Commission** Submitted by: Sara Wan, California Coastal Commission  
on behalf of: Meg Caldwell, Chair, California Coastal Commission  
Submission Date: December 13, 2005

2) there have been no studies that have attempted to study population declines due to noise;  
3) if we were able to detect a population decline, it would be difficult if not impossible to tie it to noise;

**Eighty-three different species of cetaceans are currently recognized, and audiograms have been developed for only 11 species, all of which are odontocetes.**

- The hearing of mysticete whales remains unmeasured.
- Uncertainty regarding the specific uses of sound by marine mammals (e.g., extent, context) makes it difficult to detect or interpret changes in behaviors associated with sound.
- We know relatively little about the extent of marine mammals' use of sound from natural sources (for navigation, prey detection, predator avoidance, or other uses).
- There is uncertainty about how marine mammals use sound to communicate or carry out other functions.
- The ranges and circumstances of effective communication using sound are also unclear.
- There is limited information available on what constitutes normal behavior for many species.
- There is a lack of baseline behavioral data making it difficult to assess the impact of sound or determine what would constitute a biologically significant disturbance.
  
- There is uncertainty about whether an animal hears the same types of sounds that it produces, and therefore whether it is appropriate to estimate an animal's audiogram by examining its sound production.
- There is uncertainty about whether or not sounds to which animals are relatively

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Assessing the hearing capabilities of mysticete whales  
A proposed research strategy for the Joint Industry Programme on Sound and Marine Life. 2007 Colleen Reichmuth, UCSC.

insensitive are still important to their survival.

- There is uncertainty about the pathways by which sound travels to the inner ear and about other mechanisms for hearing in marine mammals.
- There is uncertainty about the onset of auditory trauma in marine mammals, including which types and levels of sound exposures will induce trauma in which species
- There are limited experimental data on TTS (temporary threshold shift) in marine mammals, and no experimental data on PTS (permanent threshold shift, i.e., deafness).
- It is uncertain whether increased sound levels in the oceans could cause auditory developmental problems for young marine mammals.
- We do not know whether marine mammals have natural mechanisms to protect their hearing. If they do have protective mechanisms, they may not work in the same way as in the ears of terrestrial mammals. If marine mammals do have protective mechanisms, we do not know whether or how they might fatigue.
- There is uncertainty about whether the auditory systems of mysticetes may be more likely than those of odontocetes to be affected by low- to mid-frequency sounds because mysticetes' vocalizations consist of these same frequencies.
- While masking is known to be a common, naturally occurring phenomenon, there is uncertainty about the specific conditions under which, and the extent to which, it occurs in marine mammals, and when it is significant.
- The full range of options available to marine mammals to overcome masking is not known.
- There is uncertainty about the potential of general, non-directional ambient noise to cause masking, which results from a lack of information about ambient noise levels
- Uncertainties exist about baseline feeding rates and hunting success, mate-searching behavior, and predator avoidance affecting scientists' understanding of whether masking is likely to adversely affect the survival or reproductive success of an individual or population.
- Direct effects of masking are difficult to demonstrate in the field.
- The prevalence of non-auditory physiological sound effects (e.g., stress, neurosensory effects, effects on balance, tissue damage from acoustic resonance, gas bubble growth in tissues and blood and blast-trauma injury) in marine mammals and the relative vulnerability of different species to such effects are uncertain.

## MONITORING

These recommendations, made by two of the most recognised experts in the US, have not been addressed by NMFS. The Coalition believes the following statements are critical in assessing the proposed study.

“The monitoring of anthropogenic sound and its effects on marine mammals is achieved through the following procedures.. **(c) Postactivity surveys of marine mammals that were exposed to, and thus may have been affected by, the activity are conducted** ( Coalition emphasis) . The nature of such surveys (e.g., aerial surveys, shore-based visual surveys, passive acoustic surveys) can vary on the basis of the activity and environmental conditions.<sup>6</sup>

### Science foundation

In order to create an acoustic-habitat framework, science foundations must (a) summarize natural and anthropogenic sound sources by region and period; (b) map the sound fields generated by each source; (c) merge the sound field maps to depict the overall acoustic habitat and highlight areas in which cumulative effects are likely to occur; (d) list marine-mammal species and all proposed offshore activities by region and period; and (e) summarize the behavioral ecology for marine-mammal species by region and season and map distribution, relative abundance, and ecologically important areas (e.g., those used for feeding, breeding and migration).

### Acoustic-habitat framework

The acoustic-habitat framework must (a) overlay acoustic-habitat maps with maps of marine-mammal distribution patterns, relative abundance, and ecological importance and (b) identify areas or periods of concern and data gaps, including limitations on the understanding of sound sources and propagation, as well as the behavioral ecology of potentially affected marine mammals.<sup>7</sup>

## STRESS.

The following paper is attached as evidence of stress which has not been taken into account :-

Considerations of the Effects of Noise on Marine Mammals and other Animals  
Andrew J. Wright and Lauren Highfill, *Guest Editors*  
2007, Volume 20, Numbers 2-3 International Journal of Comparative Psychology

---

<sup>6</sup> A New Framework for Assessing the Effects of Anthropogenic Sound on Marine Mammals in a Rapidly Changing Arctic  
SUE E. MOORE, RANDALL R. REEVES, BRANDON L. SOUTHALL, TIMOTHY J. RAGEN,  
ROBERT S. SUYDAM, AND CHRISTOPHER W. CLARK

<sup>7</sup> *ibid*

## CONCLUSION

The Coalition concludes its submission by highlighting the major points of objection.

- No current population estimate for ENP Gray whales. The latest published estimate is 2006/07.
- No acknowledgement of the likely presence of Western Pacific Gray Whales
- No acknowledgement of the likely presence of Pacific Feeding Aggregation whales.
- Concern that November and December are critical months for the migration of heavily pregnant Gray whales and newborn calves
- Sensitivity of Gray whales to low mid and hi frequency sonar
- Lack of audiograms for most species which will be impacted by sonar
- Inappropriate designation of Level B Harassment
- PBR level is invalid and if the "take" becomes a Level A take, the number of whales taken could be of concern.
- Lack of any proper post-survey studies and methodology.
- Cumulative impact of seismic airguns, multibeam echo sounder, sub-bottom profiler, and noise from aerial surveys

The Coalition submits the PG&E HESS should not be allowed to proceed.

Yours truly,

*Sue Arnold*

Sue Arnold  
CEO

*Hunter Kilpatrick*

Hunter Kilpatrick  
Central Coast Director



**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:05 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: CGWC submission  
**Attachments:** Pt. Vicente GW Census Data (Dec) 2007-2011.pdf; cover letter to cassidy.pdf; Submission to CCC PGE HESS.pdf; WESTERN GRAY WHALE MIGRATION.pdf; ijcp-20-2-3.pdf

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**From:** hunter kilpatrick [<mailto:morrobayhunter@yahoo.com>]  
**Sent:** Tuesday, October 09, 2012 6:25 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** CGWC submission

Cassidy,

Enclosed you will find our submission along with documents supporting photographic identification of Western Gray's, the ACS/LA census data for December 2007-2011 and an article from the International Society for Comparative Psychology (emailed only – it's a big one) on the effects of noise on marine mammals and other animal.

Thank you for taking the time on the phone with me today and I hope I can make the meeting on the 25<sup>th</sup> with Sue. She asked me to confirm a time that works good for you. You can confirm with me by email or phone whichever works best for you.

Please feel free to contact me or Sue if you would like any information clarified or would like more data on any issue of this.

Sincerely,

Hunter Kilpatrick  
Central Coast Director  
California Gray Whale Coalition  
(805) 772-7501

ISSN 0889-3667  
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## International Journal of Comparative Psychology



Published by the  

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International Society for Comparative Psychology

Stan Kuczaj, *Editor*

**Considerations of the Effects of Noise  
on Marine Mammals and other Animals**

Andrew J. Wright and Lauren Highfill, *Guest Editors*

---

2007, Volume 20, Numbers 2-3

This is an enclosure to e-mail sent by Hunter Kilpatrick

## PHOTOGRAPHIC COMPARISON OF THE WESTERN AND MEXICAN GRAY WHALE CATALOGUES: 2012.

J. Urbán R.<sup>1</sup>, D. Weller<sup>2</sup>, O. Tyurneva<sup>3</sup>, S. Swartz<sup>4</sup>, A. Bradford<sup>5</sup>, Y. Yakovlev<sup>3</sup>, O. Sychenko<sup>6</sup>, H. Rosales N<sup>1</sup>, S. Martínez A<sup>1</sup>, A. Burdin<sup>6</sup> and A. Gómez-Gallardo U.<sup>1</sup>

<sup>1</sup> Programa de Investigación de Mamíferos Marinos. Universidad Autónoma de Baja California Sur, La Paz, B.C.S., Mexico

<sup>2</sup> Protected Resources Division, Southwest Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 3333 North Torrey Pines Court, La Jolla, CA, 92037-1022 USA

<sup>3</sup> A.V. Zhirmunsky Institute of Marine Biology, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, 690041, Russia.

<sup>4</sup> Laguna San Ignacio Ecosystem Science Program, Darnestown, MD, USA

<sup>5</sup> Protected Species Division, Pacific Islands Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Honolulu, HI, USA

<sup>6</sup> Kamchatka Branch of Pacific Institute of Geography, Far East Branch - Russian Academy of Sciences, Petropavlovsk, Kamchatka, Russia

### ABSTRACT

Photographs of 217 identified gray whales obtained from the Sakhalin Island, Russia feeding grounds were compared with 6,546 photo-identified individuals from the Baja California Peninsula, Mexico breeding lagoons to identify matches between these two populations. A total of 14 matches of individuals were found, including six males, six females and two of unknown sex. Thirteen whales had sightings prior to and after to their respective sighting in Mexico. Thirteen whales were observed in Laguna San Ignacio and one in Laguna Ojo de Liebre. Eleven of the 14 whales were photographed in Mexico only in one year and the other 3 in two years. Thirteen whales were sighted in Sakhalin in the summer of 2011. Twelve whales were sighted in consecutive seasons, eight of them in three consecutive seasons (summer-winter-summer), three in two seasons (summer-winter), and five in two seasons (winter-summer). Three whales were sighted the same day in Laguna San Ignacio suggesting that these animals were traveling in association with each other. Five females with calves were sighted in the winter in Mexican waters and in the next summer off Sakhalin, three of them without calves suggesting that these females had either separated from their calves or that their calves did not survive. The time between the last sighting in one season and the first one in the next season was  $\bar{x}=195.4$  days ( $n=11$ , 141-255) during the summer-winter migration, and  $\bar{x}=165.6$  days ( $n=13$ , 131-213) during the winter-summer migration. The matches made between whales sighted off Sakhalin and the Mexican Pacific are the first results of the multinational collaboration "PACIFIC WIDE STUDY ON POPULATION STRUCTURE AND MOVEMENT PATTERNS OF NORTH PACIFIC GRAY WHALES" initiated under the coordination and support of the International Whaling Commission last year.

### INTRODUCTION

Recent results of genetic and photographic identification comparisons between western and eastern North Pacific gray whales (see IWC, 2011) suggest a mixing of these populations during the winter reproductive season, and illustrate the great conservation and management importance of a more comprehensive examination of gray whale movement patterns and population structure in the North Pacific. The Scientific Committee recommended that a collaborative Pacific-wide study be developed under the auspices of the IWC, recognising that *inter alia* this will contribute to the Committee-

endorsed Conservation Plan for western North Pacific gray whales and incorporate previous recommendations made by the Committee. Such a study will involve collaborative analysis and sharing of existing data as well as the collection of new data. This report summarizes the results of the “(Phase 1) photo-identification project”. The purpose of this project was to undertake a comparison of two western gray whale catalogues from Sakhalin Island, Russia with the Mexican gray whale catalogue.

## METHODS

The comparison was done based on two catalogues of photo-identified gray whales from Sakhalin Island and one catalogue of gray whales from Laguna San Ignacio and Laguna Ojo de Liebre on the west coast of the Baja California Peninsula, México.

### *The Sakhalin catalogues*

The first step was to compare the two catalogues available at that moment:

1) The Russia-US catalogue (2012).

Burdin, A. M., Weller, D., Sychenko, O., and Bradford, A. 2012. “*WESTERN GRAY WHALES OFF SAKHALIN ISLAND, RUSSIA: A CATALOG OF PHOTO-IDENTIFIED INDIVIDUALS*”.

205 individuals. Period 1994-2011

2) The IBM catalogue.

Tyurneva, O. Yu. and Yakovlev, Yu. M. 2010. “*THE WESTERN PACIFIC GRAY WHALES OF SAKHALIN ISLAND 2002-2008, LEARNING ABOUT A POPULATION OF WHALES THROUGH PHOTOGRAPHS*”.

165 individuals. Period: 2002-2008

As result of these comparisons 217 photo-identified gray whales from Sakhalin were used in the comparison with the Mexican catalogue. All are represented by the right-side dorsal flank and 215 are associated with the left-side dorsal flank

### *The Mexican catalogue*

This catalogue includes 6,546 gray whales. 5366 photo-identified in Laguna San Ignacio between 1993 and 2011, and 1180 in Laguna Ojo de Liebre (Scammon’s Lagoon) between 2001 and 2003. Of the 6,546 whales in the catalogue 5,890 are represented by a right-side of the dorsal flank image and 1,837 were associated with a left-side dorsal flank image (Table 1).

Table 1. Number of photo-identified gray whales in the Mexican catalogue. Laguna Ojo de Liebre = LOL, Laguna San Ignacio = LSI.

year	Total photo-id whales	Right and left sides	Only right side	Only left side	Lagoon
2001	398	0	398	0	LOL
2002	462	0	462	0	LOL
2003	320	0	320	0	LOL
1996	157	0	155	2	LSI
1997	310	0	310	0	LSI
1998	392	0	392	0	LSI
1999	253	0	253	0	LSI
2000	448	0	448	0	LSI
2003	247	0	247	0	LSI
2005	438	18	420	0	LSI
2006	249	22	226	1	LSI
2007	495	150	217	128	LSI
2008	358	114	137	107	LSI
2009	662	286	238	138	LSI
2010	750	250	319	181	LSI
2011	607	341	167	99	LSI
<b>Total</b>	<b>6546</b>	<b>1181</b>	<b>4709</b>	<b>656</b>	

## RESULTS.

The Sakhalin to Mexico catalog comparison resulted in a total of 14 confirmed matches of individuals, including six males, six females and two of unknown sex. Thirteen whales had sightings prior and after to their respective sighting in Mexico. Twelve whales were observed in Laguna San Ignacio and one (#3) in Laguna Ojo de Liebre. Eleven of the 13 whales were photographed in Mexico only in one year and the other 3 in two years. Thirteen whales were sighted in Sakhalin in the summer of 2011 (Table 2).

All fourteen whales were sighted in consecutive seasons, eight of them in three consecutive seasons (summer-winter-summer), three in two seasons (summer-winter), and six in two seasons (winter-summer). Whale #2, male, was sighted in summer-winter (2006-2007), and summer-winter-summer (2009-2010); the whale #9, female, was sighted in summer-winter-summer (2006-2007), and in the winter-summer (2011); and the whale #11, was sighted in summer-winter-summer (2007-2008), and in the summer-winter (2009-2010) (Table 3).

The whales #5, #6 and #12 were sighted the same day, February 24 2006, and whale # 20 was sighted two days later in Laguna San Ignacio. The whales #5 and #12 were in the same group and #6 in a different group, suggesting that these animals were traveling in association with each other (Table 3).

The six known females were sighted with calves in the winter in Mexican waters and in the next summer in their feeding grounds, three of them without calves (Table 3), suggesting that these females had either separated from their calves (e.g. weaned) or that their calves did not survive (e.g., due to predation).

The female #7 was observed with calf in March 11, 2009 in Laguna San Ignacio and 122 days later, on July 11, off the Kamchatka Peninsula where she stayed with her calf at least until September 2. The female #14 was observed with calf on February 17, 2011 in Laguna San Ignacio and 140 days later in Sakhalin Island.

The time between the last sighting in one season and the first one in the next season was  $\bar{X}=195.4$  days ( $n=11$ , 141-255) during the summer-winter migration, and  $\bar{X}=165.6$  days ( $n=13$ , 131-213) during the winter-summer migration. The shorter time between Laguna San Ignacio and Sakhalin was of the whale #13, of unknown sex, with 131 days followed by the whale #4, a male, with 139 days, and the whales #8, #11, and #14, mothers with calves, with 144, 143, and 140 days respectively (Table 3). Table 2. Sighting summary information for 13 gray whales matched between Sakhalin and Mexico. \* = With calf.

#	Russia-US		IBM		UABCS		Russia-US Sex
	No.	Years	No.	Year(s)	No.	year(s)	
1 <sup>1</sup>	20	97,02-04,07,09,11	80	06,07	06-0209-D-LSI	06	M
2 <sup>1</sup>	52	98,99,00,01,02,03,05,06,08,09,10,11	26	02,05,08	07-0328-I-LSI, 10-0639-D-LSI	07,10	M
3	27	95,97,98,99,00,01,02,04,05,06,07,09,10,11	2	02,05	02-0336-D-LOL	02	M
4	91	00,05,07,08,09,11	137	07	11-0273-D-LSI	11	M
5	28	97,98,99,00,01,03,04,05,06,07,09,11	59	05,07	06-0131-D-LSI	06	M
6	69	98,00,01,02,03,04,08,09,11	113	04,05,07	06-0176-D-LSI	06	M
7 <sup>1</sup>	42	97,98,99,00,03,04,05,11	90	03,05,09*	09-0696-D-LSI-M	09*	F
8 <sup>1</sup>	63	97,98*,00,01,02,05,07,08,10,11*	47	03,05,07	08-107-I-LSI-M	08*	F
9	103	01,02,04,05,11	119	05,06,07	07-0457-D-LSI, 11-0526-D-LSI-M	07,11*	F
10	29	97,98,00,01,02,03,04,05,07,09,10,11	28	03,05	10-0739-D-LSI-M	10*	F
11	85	99,01,02,04,05,08*,09,11	51	04,05,07	08-0051-D-LSI-M, 10-0396-D-LSI	08*,10	F
12	94	00,03,04,05,07,11	57	03,06,07,08	06-0132-D-LSI	06	U
13			166	09	09-0506-D-LSI	09	U
14	3	97,99,04,05,06,09	144	05,06,07,08,11*	11-0505-D-LSI-M	11*	F

<sup>1</sup>Reported in Weller *et al.* 2011, <sup>2</sup>Observed only off Kamchatka

Table 3. Gray whales sighted in consecutive seasons.

#	Sakhalin (Summer)		Mexico (Winter)	Sex	Summer	Days	Winter	Days	Summer
	RusUS	IBM							
1	20	80	06-0209-D-LSI	M			26-Feb-2006	213	27-Sep-2006
2	52	26	07-0328-I-LSI, 10-0639-D-LSI	M	22-Aug-2006 07-Aug-2009	181 217	20-Feb-2007 13-Mar-2010	177	06-Sep-2010
3	27	2	02-0336-D-LOL	M	31-Jul-2001	217	06-Mar-2002	150	03-Aug-2002
4	91	137	11-0273-D-LSI	M			01-Mar-2011	139	18-Jul-2011
5	28	59	06-0131-D-LSI	M	07-Aug-2005	200	24-Feb-2006	179	22-Aug-2006
6	69	113	06-0176-D-LSI	M	23-Ags-2005	184	24-Feb-2006		
7	42	90	09-0696-D-LSI-M	F			11-Mar-2009*	122	11-Jul-2009*
8	63	47	08-107-I-LSI-M	F	09-Sep-2007°	201	29-Mar-2008*	144	20-Aug-2008°
9	103	119	07-0457-D-LSI, 11-0526-D-LSI-M	F	17-Oct-2006”	141	08-Mar-2007° 08-Mar-2011*	189 170	13-Sep-2007” 25-Aug-2011°
10	29	28	10-0739-D-LSI-M	F	07-Aug-2009°	219	14-Mar-2010* 29-Mar-2010*	176	06-Sep-2010°
11	85	51	08-0051-D-LSI-M, 10-0396-D-LSI	F	16-Sep-2007” 24-Jul-2009	163 255	26-Feb-2008* 06-Mar-2010*	143	19-Jul-2008*
12	94	57	06-0132-D-LSI	U	06-Sep-2005	171	24-Feb-2006	203	16-Sep-2006
13		166	09-0506-D-LSI	U			04-Mar-2009	131	113-Jul-2009
14	3	114	11-0505-D-LSI-M	F			17-Feb-2011*	140	07-Jul-2011*

\*with calf

°without calf

“presence of calf unknown

## DISCUSSION

The 14 individuals sighted in Mexican waters represent about 10% of the western gray whale population based on the population assessment of an estimate of 130 individuals (90% Bayesian CI = 120-142) (Cooke *et al.* 2008). If we combine these matches with the six matches found off the coast of Vancouver Island reported by Weller *et al.*, (2011), presumably during their migration from the breeding lagoons along the Mexican coast, and the two genetic matches noted by Lang *et al.*, (2011) with whales sampled in southern California, a total of 22 whales identified as part of the western gray whale population have migrated, at least in some years, to the eastern North Pacific during the winter breeding season.

The presence of three of these whales the same day in Laguna San Ignacio, two in the same group, indicate that these whales may travel in association or in groups, as Weller *et al.*, (2011) observed based on six matches off Vancouver Island, British Columbia, Canada. This also suggests that these whales may stay together in groups while on the breeding grounds.

The sex of the whales (six males, six females and two of unknown sex) indicates that both sexes, in approximately equal numbers, migrate to Mexican waters during the winter breeding season.

The sighting of females without their calves on the Russian feeding grounds suggests a high mortality of the calves, based on the small sample of four mothers with calf sighted in Laguna San Ignacio and the next summer off Sakhalin and one off Kamchatka (i.e., only a 50% survivorship). The long distance of their migratory destination compared to the Bering and Chukchi Seas could be an important factor in the survivorship of the calves. Alternatively, these females may have separated from their calves as the normal weaning process when the calves were of sufficient age to begin foraging for themselves.

The number of days between the last photograph of the season and the first one of the next season represents the maximum migration time and depends on the presence of the whale, the chance to find and photograph it, and the field work seasons of the different research teams. The shorter times observed between Laguna San Ignacio and Sakhalin, 131-143 days, could be close to the real migration times of these whales.

The matches made between whales sighted off Sakhalin and the Mexican Pacific are the first results of the multinational collaboration "PACIFIC WIDE STUDY ON POPULATION STRUCTURE AND MOVEMENT PATTERNS OF NORTH PACIFIC GRAY WHALES" initiated under the coordination and support of the International Whaling Commission last year. Additional comparisons and analyses of photographs from the Western and Eastern gray whales are ongoing and will include photographs from the IBM Sakhalin catalogue 2008-2011, IBM Kamchatka catalogue, and from Laguna San Ignacio and Bahia Magdalena winter aggregation and breeding areas, obtained during the winter 2012.

#### **Acknowledgements**

We wish to thank our field researchers and colleagues that assisted with the documentation of the gray whales in Laguna San Ignacio and Laguna Ojo de Liebre. We also thank The Ocean Foundation, and the World Wildlife Fund-Mexico for their support of the field work and analysis of our results. This research was conducted as part of the Laguna San Ignacio Ecosystem Science Program (LSIESP) under special scientific research permits No. SGPA/DGVS/11560/10 and SGPA/DGVS/00640/12 from the Subsecretaría de Gestión Para La Protección Ambiental, Dirección General de Vida Silvestre, de Mexico.

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- Weller, DW, Klimck, A., Bradford, A.L., Calambokidis, J., Lang, A.R., Gisborne, B., Burdin A.M, Szaniszlo, W., and Brownell RL, Jr. (2011) Movements of western gray whales from the Okhotsk Sea to the eastern North Pacific.

*LSIESP June 2012*

Paper SC/63/BRG6. 5pp Submitted to the International Whaling Commission Scientific Committee. [Available from <http://www.iwcoffice.org/>]

Coastal Commission:  
September 20, 2012

This declaration is in regards to the plans by PG&E to conduct detrimental seismic testing off the coast of Morro Bay in the fall of 2012. My name is Beau Woodson and I am writing on behalf of the Native American Recruitment and Retention Center at the University of California at Berkeley to inform you that we have recently become aware of the possible and probable damages that will be caused to marine animal habitats due to the seismic decibel testing off the coast of Morro Bay. The Native American students body here at UC Berkeley is appalled at the complete lack of consultation by PG&E with the Native American communities along the coastal regions near the test site.

It has come to our attention that the permit that is being used for this project ([http://www.nmfs.noaa.gov/pr/pdfs/permits/pge\\_filed\\_federalregister.pdf](http://www.nmfs.noaa.gov/pr/pdfs/permits/pge_filed_federalregister.pdf)) claims that the damages to the dolphins, whales, and other creatures is a necessary loss for the mapping of the earthquake fault. Many of the population trends (pg. 26-28 of that report) have been labeled as "unable to determine" or "no information available." This lack of knowledge on some of the major creatures of that report shows that PG&E and their researchers are unaware of the losses to our precious animal communities. This neglect and carelessness is intolerable. Our community is organizing in order to defend these animals and habitats on an issue in which they have no say and no rights. The U.S. Endangered Species Act of 1973, as cited by the permit, should protect them in such cases as these.

The deserted future that PG&E proposes to leave us with in the wake of these testings can only be speculated in comparison to the recent testings off the coast of Peru, (<http://www.globalpost.com/dispatch/news/regions/americas/120417/peru-massive-dolphin-deaths>). The hierarchy of species and interests is clear; the motivations are transparent. Our fragile ocean ecosystem is ONCE AGAIN being pushed aside in the interests of corporate progress.

Article 8.2 part b (pg. 5) of the recent UNDRIP (United Nations Declaration of the Rights of Indigenous Peoples) ([http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf)) states that:

2. States shall provide effective mechanisms for prevention of, and redress for:
  - (b) Any action which has the aim or effect of dispossessing them of their lands, territories or resources.

This letter is in direct support of the NCTC and the Northern Chumash peoples' rights to protect their environment and the sea creatures as a cultural resource. This is summarized in article 26 of the UNDRIP:

Article 26

1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.

The mapping of this fault is already adequate. The recorded information on this earthquake fault can be used to do the improvements that PG&E is seeking to do on their facility at Diablo Canyon without doing this dangerous testing. As a community we propose that you use the existing data in order to work in harmony with the environment in which the facility is located.

We will pray and we will continue to live in a good way as we have for thousands of years. We only hope and pray that you too will consider the next seven generations that will be affected by the actions of this testing.

Sincerely,  
Beau Woodson  
Facilitator and On-Campus Outreach Coordinator  
Native American Recruitment and Retention Center  
Native American Studies Department  
U.C. Berkeley



Incorporated 1977

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August 13, 2012

VIA ELECTRONIC MAIL

E-mail: [cteufel@coastal.ca.gov](mailto:cteufel@coastal.ca.gov)

Chair Mary Shallenberger  
The California Coastal Commission  
45 Fremont Street, Suite 200  
San Francisco, CA 94105-2219

VIA ELECTRONIC MAIL

Email: [Jennifer.Deleon@slc.ca.gov](mailto:Jennifer.Deleon@slc.ca.gov)

Jennifer Deleon, Project Manager  
California State Lands Commission  
100 Howe Avenue, Suite 100-South  
Sacramento, CA 95825

Dear Chair Shallenberger, Members of the CA Coastal Commission, Project Manager Deleon

Save The Whales, a nonprofit corporation based in California, is writing on behalf of the proposed PG&E's Central Coast California Seismic Imaging Project ("Project") and to express our objection to this testing.

We understand that PG&E desires to do the Project because of the disastrous tsunami in Japan last year and the resultant emergency at the Fukushima Daiichi Nuclear Power Station. PG&E is concerned because of the possibility of a similar scenarios at the Diablo Power Plant in Avila Beach, CA, a plant built on a known earthquake fault.

Of major concern to Save The Whales is the potential harmful and significant effects of the Project, particularly on endangered species of marine mammals: blue whales, fin whales, humpback whales, gray whales and California sea otters. A species with great potential harm is the small population of harbor porpoise in the Morro Bay area. They are the species that are most sensitive to loud man-made sound and the mammal most vulnerable to habitat abandonment and to hearing loss. Because they depend on sound – like whales – to function, the Project could destroy their capability to survive and reproduce.

Because of the harbor porpoises' limited range including most of its core habitat, it would coincide with the Project. Every day of the survey would greatly impact these animals.

The CCCSIP Final Environmental Impact Report (FEIR) determined that permanent hearing loss and other serious injury could result from the Project and would surpass what the Morro Bay population can annually sustain and that these injuries are "significant and unavoidable." The impact of behavioral disruption could have even greater consequences as the population could leave the majority of their habitat at the height of their breeding season and during the first months of mothers nursing their calves. They could be forced into less than optimal areas that would most likely not be able to sustain the required caloric intake. The FEIR believes that the impact on harbor porpoises would be significant and unavoidable.

A California Nonprofit 501(c)(3) Organization

1192 Waring Street, Seaside, CA 93955

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email: [maris@savethewhales.org](mailto:maris@savethewhales.org)

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Incorporated 1977

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*Richard W. Osborne, Ph.D.*  
Research Associate  
The Whale Museum

*Isabel Beasley, Ph.D.*  
Postdoctoral Fellow  
James Cook University

Newly established marine protected areas (MPA) in San Luis Obispo County contain valuable plant and animal life and they are considered particularly important and worthy of MPA designation. It conflicts between the Project and Sections 30230 and 30240 of the Coastal Act and portions of Section 36710. The seismic survey could affect marine resources including Point Buchon State Marine Reserve, Point Buchon State Marine Conservation Area, Cambria State Marine Park and White Rock State Marine Conservation Area. MPAs were established to protect and conserve marine life and its habitat. The taking of marine resources is explicitly prohibited within State Marine Reserves as designated under the Marine Life Protection Act.

Surely, important recommendations in the final Project design demand that all necessary measures to lessen the impact on endangered marine mammals, other affected animals, closure of fisheries, and habitat destruction make it mandatory that methods to offset these disasters be utilized. The animals of the Central Coast must be preserved with all due respect, as well as the economic disasters from impacts on fishery closures and disruptions, whale watching and recreational activities. Consideration must be given to calving and subsequent nursing periods of marine mammals. Delaying start times would avoid the highest densities of blue, fin and humpback whales, sea otters, and the porpoise population. It would also avoid the larval peak months for commercial fish species even though it would not appreciably lessen direct impacts on fisheries.

The Natural Resources Defense Council (NRDC) has given in-depth Alternatives for acquiring data. It is critical that they be examined and understood, as the proposed Project would only have a moderate chance of providing fault data due to the Franciscan rock in the Project area.

The National Oceanic and Atmospheric Administration (NOAA) states that time and place restrictions designed to protect high-value habitats are among the most effective means that are available for reducing impacts of underwater noise, include noise from oil and gas exploration.

A seismic survey like the Project, its proposed duration and extent has not been conducted along the coast of California. The potential impacts to marine mammals and marine resources are serious.

For PG&E to undertake this Project, there must be a comprehensive safety and monitoring plan in place to protect marine species.

Sincerely,

Maris Sidenstecker II  
Marine Biologist, Co-Founder  
Save The Whales  
A 501(c)(3) nonprofit organization  
[www.savethewhales.org](http://www.savethewhales.org)  
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Chair Mary Shallenburger  
Members of the CA Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

August 10, 2012

**Subject: Central Coastal California Seismic Imaging Project**

Dear Chair Shallenburger and Members of the Commission:

After careful review and thoughtful consideration of all options Greenspace cannot support the Seismic Imaging Study plan as outlined by PG&E which may be on your agenda in September 2012.

Specifically, the Seismic study area includes the newly established Marine Protected Areas (MPA's) including the Pt. Buchon State Marine Reserve, Pt. Buchon State Marine Conservation Area, White Rock (Cambria) State Marine Conservation Area and the Cambria State Marine Park. **Take** (killing, harming, or removing) of Marine resources is explicitly prohibited within State Marine Reserves under the Marine Life Protection Act. The proposed study describes **significant and unavoidable impacts (or take)** to whales, dolphins, porpoise, turtles, sea otters, mammals, fish, birds and other protected species and habitats.

These protected areas were established with input from hundreds of stakeholders including agency representatives, scientists, commercial and recreational fishermen, harbor masters, scuba divers, photographers, surfers, boat owners, researchers, environmentalists, and citizens through a statewide process that lasted a decade. MPA's are designed to protect and preserve areas of special ecological, biological, recreational, scenic and/or cultural significance. Boundaries for the Marine Protected Areas were carefully drawn based on geographical location and specific size and spacing between protected areas in order to capitalize on ocean currents and upwelling, larval transport, kelp forests and ocean conditions that support specific species of marine life and ecosystems. Sites were also chosen based on certain underwater features including rocky intertidal, rocky reef, sea canyon, coastal marsh or estuary, sandy or hard bottom habitat, in addition to many other criteria.

Sonic blasts interrupt the life cycles of these marine mammals, birds, fish and their larvae, as well as invertebrates. Baseline data has not yet been collected in full for these areas. The

installation of underwater geophones and cables could result in irreversible damage to underwater habitat containing ecosystems that have yet to be studied and mapped as described in the Marine Life Protection Act.

Greenspace respectfully asks the Coastal Commission to hold this project to the highest levels of scrutiny, and requests that all regulatory agencies enforce all applicable laws pertaining to these Marine Protected Areas and surrounding areas to the highest standards of review. At a minimum, we call for the mitigating approach as described in the Ocean Conservancy and NRDC letter of August 8 and the recommendation to:

**(1) Adopt both Alternative IIb (phased survey approach) and Alternative IIIb (three loop configuration) and limit survey activities from mid-November thru mid-December.**

In addition and as a condition of approval we request that PG&E be required to develop a comprehensive monitoring plan that addresses the full impacts to species and habitats before, during and following any survey activities.

Thank you for your consideration,

Mary WebbVP, on behalf of  
Board of Directors  
Greenspace – the Cambria Land Trust  
[www.greenspacecambria.org](http://www.greenspacecambria.org)

P.O. Box 1505  
Cambria, CA 93428  
805-927-2866

cc:

Cassidy Teufel [cteufel@coastal.ca.gov](mailto:cteufel@coastal.ca.gov)  
Jennifer DeLeon- State Lands Commission [Jennifer.DeLeon@slc.ca.gov](mailto:Jennifer.DeLeon@slc.ca.gov)  
Becky Ota –CA Dept. of Fish and Game [BOta@dfg.ca.gov](mailto:BOta@dfg.ca.gov)  
Nick Franco – CA Dept. of Parks and Recreation [NFranco@HearstCastle.com](mailto:NFranco@HearstCastle.com)  
Deirdre Whalen – Monterey Bay National Marine Sanctuary [deirdre.whalen@noaa.gov](mailto:deirdre.whalen@noaa.gov)  
Chris Yates – National Marine Fisheries Service [Monica.DeAngelis@noaa.gov](mailto:Monica.DeAngelis@noaa.gov)  
National Science Foundation- [nsfnepacommentscentralca@nsf.gov](mailto:nsfnepacommentscentralca@nsf.gov)  
San Luis Obispo County Board of Supervisors [boardofsups@co.slo.ca.us](mailto:boardofsups@co.slo.ca.us)  
Cambria Community Services District [board@cambriacsd.org](mailto:board@cambriacsd.org)

GRAY WHALE CENSUS AND BEHAVIOR STUDY  
 AMERICAN CETACEAN SOCIETY, LOS ANGELES CHAPTER  
 PT. VICENTE 1990-2011

DECEMBER 2011		SOUTHBOUND			
Day	Observ Period	Total Hours	Daily Sitngs	Daily Whales	Daily C/C
1	0545-1700	11.25	0	0	0
2	0600-1700	11.00	0	0	0
3	0545-1700	11.25	1	1	0
4	0600-1700	11.00	1	1	0
5	0600-1700	11.00	0	0	0
6	0545-1700	11.25	0	0	0
7	0600-1700	11.00	0	0	0
8	0545-1700	11.25	0	0	0
9	0600-1700	11.00	0	0	0
10	0515-1700	11.75	3	3	0
11	0600-1700	11.00	1	3	0
12	0600-1700	11.00	2	2	0
13	0545-1700	11.25	2	2	0
14	0600-1700	11.00	4	7	0
15	0530-1700	11.50	1	2	0
16	0600-1700	11.00	4	5	0
17	0545-1700	11.25	2	5	0
18	0600-1700	11.00	2	2	0
19	0615-1700	10.75	4	4	0
20	0530-1715	11.75	6	9	0
21	0600-1700	11.00	8	10	0
22	0530-1700	11.50	12	18	0
23	0600-1700	11.00	5	8	0
24	0530-1700	11.50	11	21	0
25	0545-1730	11.75	13	17	0
26	0600-1715	11.25	15	27	2
27	0530-1700	11.50	11	16	0
28	0600-1715	11.25	6	6	0
29	0600-1615	10.25	13	17	0
30	0615-1615	10.00	5	5	0
31	0530-1615	10.75	0	0	0

191

345.00 TOTAL HRS FOR MONTH

DECEMBER 2010		SOUTHBOUND			
Day	Observ Period	Total Hours	Daily Sitngs	Daily Whales	Daily C/C
1	0600-1700	11.00	0	0	0
2	0530-1700	11.50	0	0	0
3	0600-1700	11.00	0	0	0
4	0600-1700	11.00	0	0	0
5	0600-1700	11.00	0	0	0
6	0600-1700	11.00	0	0	0
7	0600-1700	11.00	0	0	0
8	0600-1700	11.00	0	0	0
9	0600-1700	11.00	0	0	0
10	0600-1700	11.00	0	0	0
11	0600-1700	11.00	0	0	0
12	0600-1700	11.00	0	0	0
13	0600-1700	11.00	1	1	0
14	0600-1700	11.00	0	0	0
15	0630-1700	10.50	0	0	0
16	0600-1700	11.00	0	0	0
17	0600-1700	11.00	0	0	0

18	0600-1700	11.00	2	3	0
19	0615-1700	10.75	1	1	0
20	0600-1700	11.00	0	0	0
21	0600-1700	11.00	4	7	0
22	0830-1700	8.50	2	3	0
23	0600-1700	11.00	1	1	0
24	0600-1700	11.00	3	5	0
25	0600-1700	11.00	2	4	0
26	0600-1700	11.00	1	1	0
27	0600-1700	11.00	4	6	0
28	0600-1700	11.00	0	0	0
29	0630-1700	10.50	3	4	0
30	0600-1700	11.00	2	2	0
31	0600-1700	11.00	0	0	0

38

337.75 TOTAL HRS FOR MONTH

DECEMBER 2009		SOUTHBOUND			
Day	Observ Period	Total Hours	Daily Sitngs	Daily Whales	Daily C/C
1	0545-1700	11.25	1	2	0
2	0600-1700	11.00	0	0	0
3	0545-1700	11.25	0	0	0
4	0545-1700	11.25	0	0	0
5	0545-1700	11.25	0	0	0
6	0600-1700	11.00	0	0	0
7	0600-1700	11.00	1	1	0
8	0530-1700	11.50	0	0	0
9	0600-1700	11.00	0	0	0
10	0545-1700	11.25	0	0	0
11	0600-1700	11.00	0	0	0
12	0545-1700	11.25	0	0	0
13	0615-1700	10.75	0	0	0
14	0600-1700	11.00	0	0	0
15	0545-1700	11.25	0	0	0
16	0600-1700	11.00	1	2	0
17	0545-1700	11.25	2	2	0
18	0600-1700	11.00	0	0	0
19	0545-1700	11.00	0	0	0
20	0615-1700	10.75	0	0	0
21	0600-1700	11.00	1	1	0
22	0600-1645	10.75	0	0	0
23	0600-1700	11.00	1	1	0
24	0600-1700	11.00	1	1	0
25	0600-1700	11.00	4	4	0
26	0545-1700	11.25	1	2	0
27	0615-1730	11.25	1	1	0
28	0600-1700	11.00	1	2	0
29	0600-1700	11.00	1	2	0
30	0600-1700	11.00	1	1	0
31	0600-1700	11.00	0	0	0

22

343.25 TOTAL HRS FOR MONTH

DECEMBER 2008		SOUTHBOUND			
Day	Observ Period	Total Hours	Daily Sitngs	Daily Whales	Daily C/C
1	0600-1700	11.00	0	0	0

2	0600-1700	11.00	0	0	0
3	0600-1700	11.00	1	3	0
4	0600-1700	11.00	0	0	0
5	0600-1700	11.00	0	0	0
6	0545-1700	11.25	0	0	0
7	0600-1700	11.00	3	6	0
8	0600-1700	11.00	1	2	0
9	0545-1700	11.25	1	3	0
10	0600-1700	11.00	2	3	0
11	0600-1700	11.00	0	0	0
12	0600-1700	11.00	1	1	0
13	0545-1715	11.50	2	4	0
14	0600-1700	11.00	1	1	0
15	0600-1700	11.00	1	3	0
16	0545-1700	11.25	2	3	0
17	0600-1700	11.00	1	2	0
18	0600-1700	11.00	1	1	0
19	0600-1700	11.00	1	3	0
20	0545-1700	11.25	3	4	0
21	0545-1700	11.25	3	7	0
22	0600-1700	11.00	0	0	0
23	0600-1700	11.00	1	2	0
24	0600-1700	11.00	1	1	0
25	0600-1700	11.00	1	1	0
26	0600-1700	11.00	3	3	0
27	0600-1700	11.00	2	4	1
28	0600-1700	11.00	0	0	0
29	0600-1700	11.00	0	0	0
30	0600-1700	11.00	3	3	0
31	0600-1700	11.00	2	2	0

342.75 TOTAL HRS FOR MONTH 62

DECEMBER 2007		SOUTHSOUND			
Day	Observ Period	Total Hours	Daily Sitngs	Daily Whales	Daily C/C
1	0530-1700	11.50	0	0	0
2	0545-1700	11.25	0	0	0
3	0545-1700	11.25	0	0	0
4	0545-1700	11.25	0	0	0
5	0600-1700	11.00	0	0	0
6	0600-1700	11.00	0	0	0
7	0600-1700	11.00	0	0	0
8	0530-1700	11.50	2	13	0
9	0515-1700	11.75	0	0	0
10	0545-1700	11.25	0	0	0
11	0545-1700	11.25	1	1	0
12	0600-1700	11.00	1	1	0
13	0545-1700	11.25	0	0	0
14	0545-1700	11.25	0	0	0
15	0530-1700	11.50	0	0	0
16	0530-1700	11.50	1	1	0
17	0545-1700	11.25	1	1	0
18	0600-1600	10.00	1	1	0
19	0600-1700	11.00	0	0	0
20	0600-1645	10.75	0	0	0
21	0600-1715	11.25	1	2	0
22	0530-1700	11.50	0	0	0
23	0530-1700	11.50	1	1	0
24	0530-1700	11.50	1	1	0
25	0545-1700	11.25	3	7	0
26	0600-1700	11.00	1	1	0
27	0600-1715	11.25	1	1	0

28	0600-1700	11.00	0	0	0
29	0600-1700	11.00	1	1	0
30	0530-1700	11.50	1	1	0
31	0545-1715	11.50	1	1	0

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34

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347.75 TOTAL HRS FOR MONTH

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## **Tagab, Clarita@Coastal**

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:01 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: Port San Luis Commercial Fishermens Association Comments and Mitigation Plan  
**Attachments:** Port San Luis Commercial Fishermens Associatio2[1].docx; PG&E draft mitigation plan[1]  
[2].doc

**From:** brian stacy [mailto:bstacy166@yahoo.com]  
**Sent:** Friday, October 26, 2012 2:22 PM  
**To:** Teufel, Cassidy@Coastal  
**Cc:** bcartercasa@aol.com; salmonkirk@gmail.com; fvdbear@charter.net; fvzfrog@charter.net; tcapen@gmail.com  
**Subject:** Port San Luis Commercial Fishermens Association Comments and Mitigation Plan

Cassidy, Please forward these to Chair Shallenberger distribute for review and consideration by the California Coastal Commisioners.

Dear Chair Shallenberger and honorable Commisioners, These are some of our Comments in regard to the seismic imageing Project that you will be considering, Proposed by PG&E to be conducted in our Central CA. Waters before the end of the year, should you approve the HESS for our area.

At Port San Luis Commercial Fishermens Association we are strongly opposed to these tests being done in our productive local waters. We urge you to consider the past actions of the applicant in regard to failure to rectify inproperly notice surveys by their contractor Fugro, And their total failure to negotiate "fair and equitable" compensation for displacement and potential long term Damage to the resources off our coast.

They Have shown total disregard for our fishermen every step of the way. They have givin out claim forms saying they would "compensate for displacement" then Denied every claim. They have refused to even make a counter offer of any kind except the Power loss claim form that they used then denied.

We have made proposals and not even recieved a response let alone a counter offer of any kind. They have tried to force us to "mediation" with their squad of attorneys and we do not have one. This is a very unfair approach considering they have never made a offer or negotiated at all. I will provide some of our correspondence to demonstrate these facts.

This Is a summary of the San Luis Obispo County Fishermerns displacement Mitigation plan we arehopefull the commision will adopt as a "Condition Of Approval" Should HESS be Permitted and allowed to take place in our productive central California waters

We feel if you can not "deny" the permitt. Our only hope after seeing how they opperate Will Be a CCC permit "condition of approval" adopting our mitigation Plan.

Our mitigation plan is basically the same as the one of the Cable installations in shellbeach in 2000. we did not inflate it or add anything at all. as far as displacement it is the same as most fishermen recieved then. These tests are proposed for the same area as well.

We have written in:

Quallifying criteria to protect the applicant from a high volume of claims yet compensate the Impacted fishermen.

Mediation for denied claims.

We included a "radius" of influence as fish are effected far away from these type of tests and these have not been done in shallow, productive nearshore waters with a thriveing fishery as the "Nearshore Rockfish fishery" as they will be done here. there are no studies on this so we included a fairly large radius "30 miles" to protect against "unknown impacts".

A fisheries damage bond of 8 million dollars to be replenished should the resource be damaged by HESS and fishermen need compensation for their losses. we hope the CCC will oversee the data and help determine the health of the resource and follow the process of distribution as well. This would be at no cost to CCC as we have included "administrative cost to be reimbursed" from the bond.

We have a 20 day pay clause for the first nine days PG&E has indicated is the least amount of time the project could be finished in, so they can not "not pay" again, and we do not feel Our fishermen should miss any paychecks or be forced to carry a note for PG&E HESS displacement at all.

We also have a professional fees incurred in Reviewing the project clause as we have had to expend those for over a year and PG&E refuses to reimburse our association.

We have agreed through this document to work with our county officials to "produce a fishing industry specific claims process" to be used by those that do not qualify under the conditions outlined in this document. Last this Mitigation plan will be available to all San Luis Obispo County Fishermen to use.

We sincerely Hope you will adopt this plan and save us from the treatment we have recieved in the past by this applicant. We are open to discuss any changes the Commission or staff feel are necessary to make this plan adoptable as a "condition of approval" for the above referenced HESS proposed by PG&E for our local waters.

I would like to point out that These type of surveys have been shown to effect catch rate in much deeper water for 5 to 14 days or more. so one would assume that our catch may not recover for 3 to 5 weeks in the shallow, productive waters off our central coast. the long term damage compensation plan will still need to be developed and process put in place so please consider these factors when looking at the daily rate we are requesting and recognise that it may be a 12 day project but fish may not be catchable for a month after.

Thank You for receiving our comments and for your thoughtful consideration of our situation with this applicant, their past performance and hopefully for adopting or working to adopt our mitigation plan as presented to you here or as modified if requested.

Kind Regards, Brian Stacy Vice President Port San Luis Commercial Fishermens Association  
805-225-1316 or 805-440-8032

**Port San Luis Commercial Fishermen's Association (PSLCFA)**

October 24, 2012

**RECEIVED**

OCT 26 2012

CALIFORNIA  
COASTAL COMMISSION  
NORTH CENTRAL COAST

Mary Shallenberger, Chair  
California Coastal Commission  
45 Fremont Street Suite 2000  
San Francisco, CA 94105

**RE: Opposition to Pacific Gas & Electric Seismic Survey:**

**Consistency Certification and Coastal Development Permit (E---12---005 and CC---027---12)**

Comments on Proposed High Energy Seismic Survey (HESS) off OUR coast

Dear Chair Shallenberger and Honorable Commissioners,

Hello, Thank you for accepting these comments and I hope you weigh them when making your decision on PG&E's request to perform the HESS within our coastal fishing waters. We urge you to deny both the Consistency Certification and the Coastal Development Permit. The proposed project violates several codes of the Coastal Act, but most importantly to us, it violates our right to make a living fishing sustainably in our local ocean waters.

**Section 30234.5 - Economic and Recreational Importance of Fishing. The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.**

My name is Brian Stacy, and I am a lifelong resident of Morro Bay (47yrs). I am a 24-year local fisherman, and I started my career in the shallow water fishery now known as the "Nearshore fishery." I am the current V.P. of PSLCFA, and for the past 13 months I have been one of the main representatives in regards to the unproductive, "NON-negotiations" with PG&E for fisheries displacement and resource damage mitigation to fishermen due to PG&E's proposed HESS. I have been frustrated by PG&E's failure to negotiate in good faith. We fishermen have learned about the destructive nature of the HESS, and the 250 dB seismic surveys, which are new to our knowledge of the ocean.

We OPPOSE these tests being permitted and conducted and have joined the C.O.A.S.T. ALLIANCE AND SUPPORT THEIR EFFORT TO STOP HIGH ENERGY SEISMIC SURVEYS HERE.

I will share my experience and knowledge I learned through a year and a half of wasted time dealing with PG&E proposing this project, and their unethical business practices. PG&E refuses to reimburse the fishing associations for legal and consulting fees incurred in our review of THEIR project. It is very difficult for fishermen to take time off work, pay gas to unproductive meetings, spend time preparing and participating in a bogus process where PG&E's only intention seems to have been to stall us to this point.

Too much valuable time and money has been spent by fishermen to understand this proposed project, which we have learned is not mandated by AB 1632, as some might have you believe. I feel my experience is relevant in your deliberations in regards to this project and any authority or influence you may have to deny a permit or advise others to do so. It should provide you enough insight to understand why PG&E should not be permitted to do the HESS. I will also share why PG&E should not have been allowed to do the low energy seismic surveys (LESS).

I will first touch on the LESS and the problems with it. The proposal for the LESS permit did not go through a CEQA process as it should have. There was no EIR or current MND to go with this project even though it was conducted around protected areas like the RCA, MPA and under the MLPA. None of these protected

marine areas were referenced in the environmental document Furgo (PG&E's contractor) was allowed to use under the California State Lands Commission's (CSLC) outdated Geophysical Survey Permit Program (GSPP). There was also no mention of current fisheries we utilize like hagfish and nearshore, the ones that were directly impacted by the LESS. Although using a totally inappropriate and outdated permit, Furgo did not even comply with the mitigation measures outlined in the 1984 MND 358 and GSPP that CSLC issued their "umbrella" permit under.

Further, CSLC refuse to accept complaints on or do monitoring after complaints were made, or enforcement of any of the inappropriate mitigation measures that were outlined in the two outdated documents. Also, they refuse to recognize the update, "guidelines to reduce conflicts between "geophysical surveys and fishermen," that was produced by Fishermen and oil companies in 1989 through the "Joint Oil Fisheries Liason Committee" in response to problems that had arisen after the 1984 program was introduced and implemented.

This background is all relevant because you are reviewing a document. The HESS EIR, that was produced by the same entity and full of inadequacies and unmitigated impacts. I thought you might like to know of the LESS situation in regard to CSLC and the project applicant, as I made Both aware of the problems.

Many problems arose from the LESS, and i believe the LESS was an Illegal seismic survey because our rights under CEQA were not provided to us by CSLC Staff. First to my area, the Nearshore, fish suffered from mortality issues (abnormal amount dying in the tank) and the catch was down by 50% in Port San Luis, and there were behavioral issues as well – a lot of fish were found to be weak. The halibut trawlers catch dropped off to near nothing, and the Hagfish fishermen were displaced as well and their catch was down 50% too. All of this happened after the ship performing the LESS showed up unannounced.

There was displacement of fishing effort by the survey vessel and noise issues as far as catching fish. The whales and bait left after the last LESS showed up unannounced creating a tourism impact to Avila and the harbor. None of these problems were Identified before they happened or mitigated after. Had we been

provided our due process under CEQA, we would have fought for all of these problems to be fully addressed, studied and mitigated as needed., alongside other California residents.

As far as the fishermen I represent go, I registered a complaint with the HESS applicant PG&E and they said "it was not their permit," but that they were "prepared to compensate the displacement of fishermen" only. They gave me a "refrigerator claim form" (fridge form) the type they give out if the power goes out and there is "food spoilage." PG&E has not created forms for fishermen, and PG&E expects fishermen to drive to the Templeton office many miles away.

Also, PG&E said they were going to pay the claims, and later they rejected them after stalling until that survey was over. PG&E told me to pass out the forms to affected fishermen, and I did. I indicated to PG&E that it was not a "fishing type of claim form," and that we should have had meetings and negotiated a process for claims, and forms qualifying criteria ect., and I asked were they prepared to do that now? PG&E refused to discuss it as it was not their permit, so they said. I asked "how did your contractor get a permit without us having a chance to review and comment and negotiate for fair mitigation for my fishermen and to identify impacts on our resources and get agreements in place to mitigate all the above. They indicated talk to FUGRO; it is their permit.

These problems happened after 12-4-11 when the unannounced 20 day LESS began. My life since PG&E refused to mitigate the fishermen has been very difficult. These problems all happened on the heels of the HESS negotiations beginning, and we fishermen have achieved nothing in regard to those. PG&E's dismissive treatment of the fishermen they displace with their surveys, and their utter disregard for our rights as established businesses, and our permits to catch fish, and our right to make a living. Unfortunately, the same can be said for PG&E's concern for the marine resources they will further disrupt should the HESS be permitted and allowed in the same general area, which I really hope it is not.

The problems are compounding: the CEQA violations, the failure to enforce mitigation measures, the fishery related issues, the overall resource issues, the compliance issues, the data poor issues, the failure to address MLPA, MPA, RCA

issues, the no compensation issues, the no agreements issues, the no baseline data issue, the noise related issues, the NO CURRENT ENVIRONMENTAL ASSESSMENT OR DOCUMENT pertinent in todays regulatory environment issues, the applicable fisheries issues. All of these problems can be traced back to denial of our rights to review a proposed permit for seismic testing like this under CEQA.

As fishermen we have a pretty good knowledge of our local ocean resources and how they could be affected by different events that happen in the ocean environment, from a "EL NINO" event to what our concerns would be with a "LESS" and most things in between. My personnel feeling about the worst thing from the LESS being conducted without review is that we lost a golden opportunity to collect data prior to these possibly surveys starting. As we did with the HESS, we fishermen would have called for a current baseline of data to be gathered so we could identify impacts after the LESS.

Now, I see that could have been applied to the HESS as well. The LESS has already had impacts on the resources, and we may never be able to know for sure what they are. More than 6 dolphins died, some seals, and a couple of sea otters, I was told they did not do mammal monitoring at all. So, we do not know what kind of harassment the whales and dolphins may have had bestowed on them, or if they were injured or killed as with no mammal monitoring, as was outlined in that old MND they used, and we will never know the full impact of the missing birds, fish, and other marine life. We have not been told the decibel level that the survey vessels used. We believe they were on the "high side" of whatever is considered low intensity.

CSLC staff told me last week that they didn't follow through because "they are too broke to provide public process and produce a new environmental document for the LESS. CSLC also refused to allow a complaint on my second attempt as well, and refused to do any enforcement too. CLLC indicated the contractor Fugro had "complied with all mitigation measures" because "Fugro told us they had," even though I was offering evidence to the opposite. They refused to take a complaint or do anything at all. They did say that currently PG&E is working on a new MND

for the LESS----- so maybe I accomplished something—after the fact and the destruction. But it makes you wonder "why not before they began LESS?"

I neglected to mention that Richard Greenwood, the CSLC staff member in charge of these surveys, was unable to produce a copy of MND 358 or the GSPP, even though he was giving out those permits. CSLC had not placed them on the website either. Two fishermen have made two formal complaints to CSLC on LESS, and CSLC has taken NO action, and they have refused to either take a complaint or monitor for compliance after I MADE THE FIRST ONE ONLY ALLOWED THEM TO GO ON. This staff developed the inadequate EIR that is lacking in so many areas that you are preparing to make a decision based on. Has anyone seen the section on the Western Grey Whale?

I think the main points I want to make are the Lack of regard for OUR CEQA rights, potential impacts to the marine resources, the needs of fishermen and their families, and the frustration the fishermen feel when PG&E does not value us and the work we do to maintain sustainable local fisheries.

Lessons learned through this process: or lack thereof:

1. PG&E cannot be trusted---not with such a valuable marine resource as our central California Ocean. They cannot be trusted to compensate affected businesses and municipalities or anybody impacted by their operations anywhere--- look at the poor folks in San Bruno and others.

2. CSLC will overlook any violation and do not understand the words mitigation, enforcement, monitoring, compliance, complaint, process, and a few others or CEQA either. We had no way or opportunity to comment. And, the current EIR for HESS would need a substantial upgrade to be inadequate----- I was being kind!

I have others, but it would seem like I resent this HESS process and LESS issues eating up so much of my life because I volunteered to be abused by PG&E when I first allowed myself to be elected "Nearshore fishermen's representative," and later, when I allowed myself to be elected V.P. of PSLCFA and become lead on this Issue. I work to protect my fellow fishermen, our marine resources, and to stop

the destruction of our marine ecosystem. I urge you to do the right thing and deny the permit and reject this destructive and intrusive unmandated project.

As fishermen, we just learned another survey vessel is arriving in our waters November 4, 2012 and will be prepared to perform sonar. How many covert activities have been occurring within our sustainable local fishing waters?

Thank You for your time and consideration in regard to this matter.

Brian Stacy, Vice President Port San Luis Commercial Fishermens Association

*PSLCFA is a member of the C.O.A.S.T. Alliance and supports their efforts to stop permitting of this project and the project itself for the sake of our local resources!*

**PG&E High Energy Seismic Survey Mitigation plan  
for displacement impacts to Commercial Fishermen**

1. Each fisherman able to prove eligibility will receive \$1,000.00 per day for the length of the survey. PG&E has indicated high energy blasting will occur 9 to 12 days to complete the 2012 survey.
2. To qualify each fisherman shall be required to provide CDF&G landing receipts (delivered in Morro Bay or Port San Luis) in the amount of \$5,000.00 for 2011 or 2012, the vessels commercial registration and captains personnel commercial fishing license and permits for the fisheries affected.
3. Claims are based on historical catch in and around the "racetrack" in at least a 30 mile perimeter. (Studies show behavioral changes 30 miles away from the airguns).
4. PG&E shall be required to pay the nine days identified as the shortest duration of the survey within twenty days of the permit approval.

To use this portion of the mitigation plan a fisherman will need to have their claim to PG&E within seven days after the permit is approved.

PG&E will pay claims that qualify under this mitigation plan provided they are filed within 6 months of the project completion date.

The compensation days will be calculated from the first day that the airguns are fired, from ramp up to the conclusion of airgun use.

5. Should PG&E dispute any fisherman's claim to be eligible for this mitigation plan, the claim shall be resolved through an independent third party mediator to be identified and approved by PG&E and PSLCFA prior to commencement of the survey. The mediator will determine if a fisherman qualifies under the terms outlined in this document.

6. PG&E will place a bond in the sum of 8 million dollars in an account for potential long term damage that may result from the High Energy Seismic Survey. These funds if needed will be replenished as used until the scientific data indicates the resource has recovered to the pre survey condition with regard to the Catch Per Unit of Effort [CPUE] as monitored by SLOSEA (San Luis Obispo Science and Ecosystem Alliance).

The remainder of these funds will be released to PG&E when the data indicates the resource has recovered to pre survey conditions.

This bond account would be administered by the County of San Luis Obispo and the County will be reimbursed for any administrative costs the County incurs.

Reimbursements for long term lost fishing income will be determined by a process to be determined by PSLCFA, and County Board of Supervisors for the effected ports.

The California Coastal Commission will monitor this process for compliance and proper data collection and processing. They will be compensated out of the fund for any costs they incur in doing so.

7. PG&E shall be required to pay all professional fees incurred by the Fishermen's Association with regard to the review of this project.

8. PG&E shall produce a fishing industry specific claim form. The fishermen's association agrees to advise and help produce this claim form in concert with the County Board of Supervisors from both port supervisors districts.
9. This Mitigation Plan is available to all San Luis Obispo County Commercial Fishermen that qualify.



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OCT 18 2012

CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
45 Fremont Street  
Suite 2000  
San Francisco, CA 94105-2219

October 16, 2012  
Re: PG&E Seismic Imaging Survey

Dear Coastal Commissioners,

The Morro Coast Audubon Society, (MCAS), encompassing the whole of San Luis Obispo County with over 1,200 members, would like to express our opposition to the Central Coastal California Seismic Imaging Project as proposed by Pacific Gas & Electric Company, (PG&E).

The proposed seismic survey conflicts with the MCAS Mission Statement – “to promote the appreciation, conservation, and restoration of ecosystems, focusing on the biological diversity of birds, other wildlife, and their habitats, particularly in San Luis Obispo County”.

According to the California State Lands Commission Final Environmental Impact Report, (EIR), July, 2012: The impact on marine biological resources would be considered significant.

**Impact MARINEBIO-12:** Injury or mortality to marine mammals would occur due to noise during seismic survey acquisition – (Significant and Unavoidable)

**Impact MARINEBIO-13:** Injury or mortality to Southern sea otters would occur due to noise during seismic survey acquisition – (Significant and Unavoidable)

**Noise-related impacts on marine mammals**, both Level ‘A’ harassment (potential to cause physical injury), and Level ‘B’ harassment (potential for behavioral disruption), would result in acoustic takes for a number of species; with the most significant impacts to fin, humpback, and blue whales; the harbor porpoise; and the Southern sea otter.

MCAS concludes that the projected harm from seismic testing far outweighs the public benefits, and that the seismic survey should not go forward as currently proposed. Until less harmful alternative methods of seismic testing are proposed, we urge the Coastal Commission to deny the coastal development permit application to conduct seismic imaging surveys in the waters offshore of the Diablo Canyon Nuclear Power Plant.

Thank you for your consideration of our concerns.

Sincerely,

  
Jennifer Moonjian  
President, Morro Coast Audubon Society



October 12, 2012

Mr. Dan Carl, Deputy Director

Central Coast District Office

725 Front Street, Suite 300

Santa Cruz, California 95060-4508

Dear Mr. Carl:

Back when I was growing up, I remember watching a powerful movie called "Day of the Dolphin." In this film, the intelligence and sensitivity of dolphins was portrayed, but the dolphins were also used to carry missiles on their backs. The heroes of the film rescue the dolphins from being sacrificed in human warfare. I will never forget the impact this film had on me. The dolphins had names and learned to talk to their trainers and express love for them. To see them exploited in the course of this story by those wishing to advance their political aims was heartbreaking. I remember crying through the movie as a teen. Countless others have grown to love dolphins and whales through the tv series "Flipper," through Sea World shows, through whale watches, and more...the more we have learned, the more we realize just how beautiful, intelligent, intuitive and amazing these animals are.

I have recently learned of the effects of seismic testing on marine life around the world, and I am appalled that this assault on these innocent, intelligent, beings is allowed to happen. Whales and dolphins are washing up in Uruguay bleeding from their eyes and snouts following testing done by oil companies in that area. What short-sightedness! It is possible that dolphins and whales will one day save human lives by warning us of earth changes. We do know they have rescued mariners in the past. They are capable of love, loyalty, have families, and can feel grief. In addition to their potential to collaborate with humans, as intelligent beings, they are valuable in and of themselves. To assault and murder them painfully with sonic waves is tantamount to torture, in the same way that we are

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OCT 12 2012

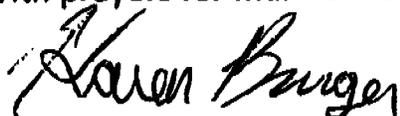
CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

horrified when pet animals are starved, fought, beaten. It is illegal to torture a dog or cat. So I ask those advocating underwater seismic testing: why is it legal to torture marine mammals and fish?

I do not think our Creator takes such torture lightly. If we allow seismic testing off the coast of California, near known marine sanctuaries even, it is a sin and a crime in my opinion. Furthermore, it is short-sighted because we are ignoring the fact that human fate and the fate of ocean life is linked inextricably! This is not simply a matter of wanting a variety of animals to continue to exist for their beauty, but because they play a role in the ecosystem!

Please do not allow seismic testing with such horrific side effects at this time off the coast of California. Please protect the wildlife that is defenseless against the extremes of human actions. Please! I beg of you. In the Name of God! This is not only allowing death to marine life, but TORTUROUS DEATH! I believe that we will reap terrible fruits if we proceed on this course as a human race.

With prayers for marine life and the web of life of our planet,



The Rev. Karen A. Burger, Pastor, United Methodist Church of Mt. Kisco,  
New York Annual Conference, United Methodist Church



Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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OCT 03 2012

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COASTAL COMMISSION  
CENTRAL COAST AREA

To Whom It May Concern,

Pacific Whale Foundation is a non-profit organization based on the Island of Maui, and since the 1980s, we have been dedicated to saving whales, and conserving and protecting marine life.

Your constituents are making it very clear that they care about their precious marine resources. Over the past week I have received not one but *two* letters from California residents concerned about the proposed PG&E testing and the consequences of these tests with regards to the number of marine mammals that are expected to be severely injured and/or killed.

The incredible number of whales along California's coast this summer alone should be testament to the rich productivity and high conservation value of this area. To think that these animals will be harmed in lieu of seismic testing (that is unlikely to reveal significant new information) is appalling. Do not sacrifice thousands of our whales, dolphins, seals and fish, along with livelihoods, culture and recreation of the people of California, for the interests of a few.

It is understandable that the nuclear power plants in question are located in high risk areas, but wanton seismic testing is not the answer. I encourage you, instead, to take the time to consider alternatives to seismic testing – a move that would benefit not only the underwater community, but the residents of California as well.

The future of California's marine resources rests on the Coastal Commission's decisions. Pacific Whale Foundation, on behalf of our thousands of supporters around the world thus urge you to seriously evaluate the long-term, biological consequences associated with the proposed testing, and in doing so, realize that the resultant irreversible damage to California's marine life significantly outweighs testing.

Sincerely,

Lauren Campbell

Conservation Manager  
Pacific Whale Foundation  
Ma'alaea Harbor Shops  
300 Ma'alaea Rd., Suite 211  
Wailuku, HI 96793


DAVE KIRK  
PRES. PORT SAN LUIS FISHERMENS ASS.  
P.O. BOX 1503  
ARROYO GRANDE, CA 93421  
805-680-4798, SALMONKIRK@GMAIL.COM

DEAR ALISON,

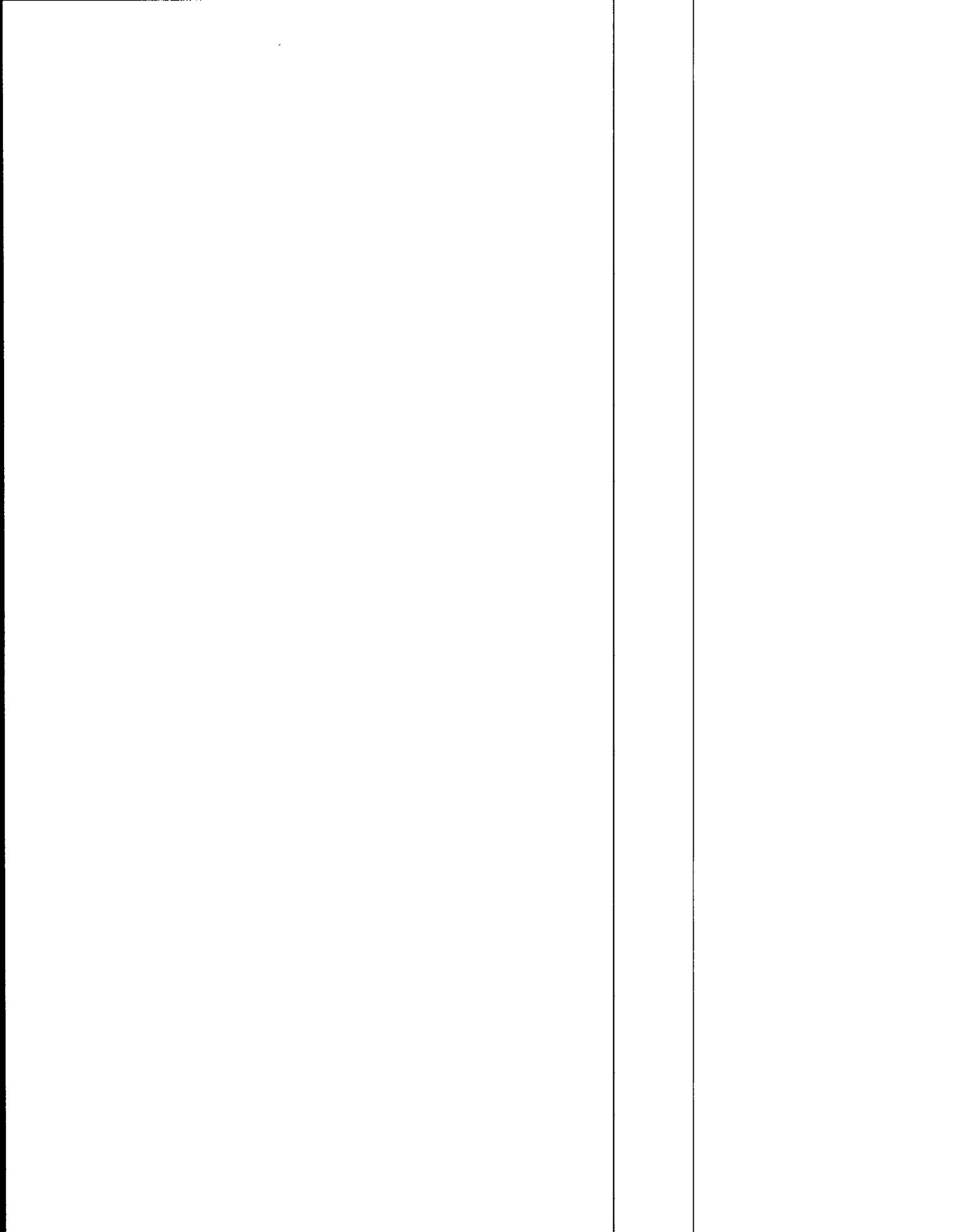
I WOULD LIKE TO SEE THE COASTAL COMMISSION REFUSE TO GRANT A PERMIT FOR SEISMIC TESTING BY PG&E. BRAZIL AND NORWAY HAVE BANNED SEISMIC TESTING, <sup>SEISMIC TESTING</sup> NORTHER AUSTRALIA FISHERMENS ASS. IS SUING TO STOP OIL EXPLORATION OFF THEIR COAST. PLEASE REFER TO SAN FRANCISCO CHRONICLE ARTICLE (PG&E, USES disagree ON DIABLO CANYON FAULT DANGER)

JEANNE HARDEBECK WHO DISCOVERED THE HOSGRI FAULT, SAYS IT RUNS UP TO BOLINAS AND IS CONNECTED TO THE SHORELINE FAULT. THIS STUDY WON'T PROVE OR DISPROVE THAT. DR

JOHNSON SAYS THE MAPPING WON'T UNCOVER VITAL INFORMATION ABOUT POTENTIAL DANGERS TO DIABLO, LIKE ITS LENGTH, THE RATE IN WHICH IT'S SLIPPING, AND HOW FREQUENTLY IT'S ERUPED IN THE PAST. NEW DATA FROM NRDC RELEASE LAST WEEK URGES NOT PERMITTING THAT THE STUDY WON'T GIVE ANY GOOD RESULTS ONE WAY OR ANOTHER - STATE LANDS APPROVED THE EIR WITH THE UNDERSTANDING THAT DAMAGE TO THE ENVIRONMENT WOULD OCCUR, BUT THE GOOD OUTWEIGHED THE BAD IN TRUTH THERE IS NO GOOD FOR THE PEOPLE OF THE STATE OF CA. THE ONLY GOOD IS FOR P.G. & E. THEY WILL GET A NEW STATE OF THE ART 3D STUDY OF THE OIL RESERVES OFF THEIR PROPERTY, PAID FOR BY THEIR CUSTOMERS.

PLEASE VIEW MY VIDIO OF TRAVIS EVANS, 90 YR OLD COMMERCIAL FISHERMAN, WHO CAPTURED A SHIP DOING 2D STUDYS OFF THE COAST. PLEASE SHARE IT WITH OTHER COMMISSIONERS THANK YOU, DAVE

P.S. AS FAR AS MITIGATION WITH FISHERMAN THEY HAVE BEEN UNRESPNSIVE, INSULTING, AND UN TRUTHFUL



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OCT 05 2012  
CALIFORNIA  
COMMISSION



California Coastal Commission

September 24, 2012

Dear Commission Members,

As the mission of the Coastal Commission is to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations, the Morro Bay Chamber of Commerce strongly urges the Commission to end any efforts to permit and allow high intensity acoustic seismic testing by PG&E in the regions surrounding the Diablo Canyon plant on the central coast.

Our fishing industry is an integral component of our community's fabric and this testing not only threatens that heritage, but also the community and economy wrapped around it. Commercial fishing, which is our second largest economic sector, had an economic impact of over \$7.4 million. The threat to our rebounding fishing industry is immeasurable and goes way beyond the ledger sheet.

By recent estimates, tourism accounts for \$70 million of our economy and is Morro Bay's largest economic sector. Visitor spending includes accommodations 22.5% of total, food and beverage services 28%, food stores 4.3%, ground transportation and fuel 11%, arts, entertainment & recreation 13.7% and retail sales 20.5%.

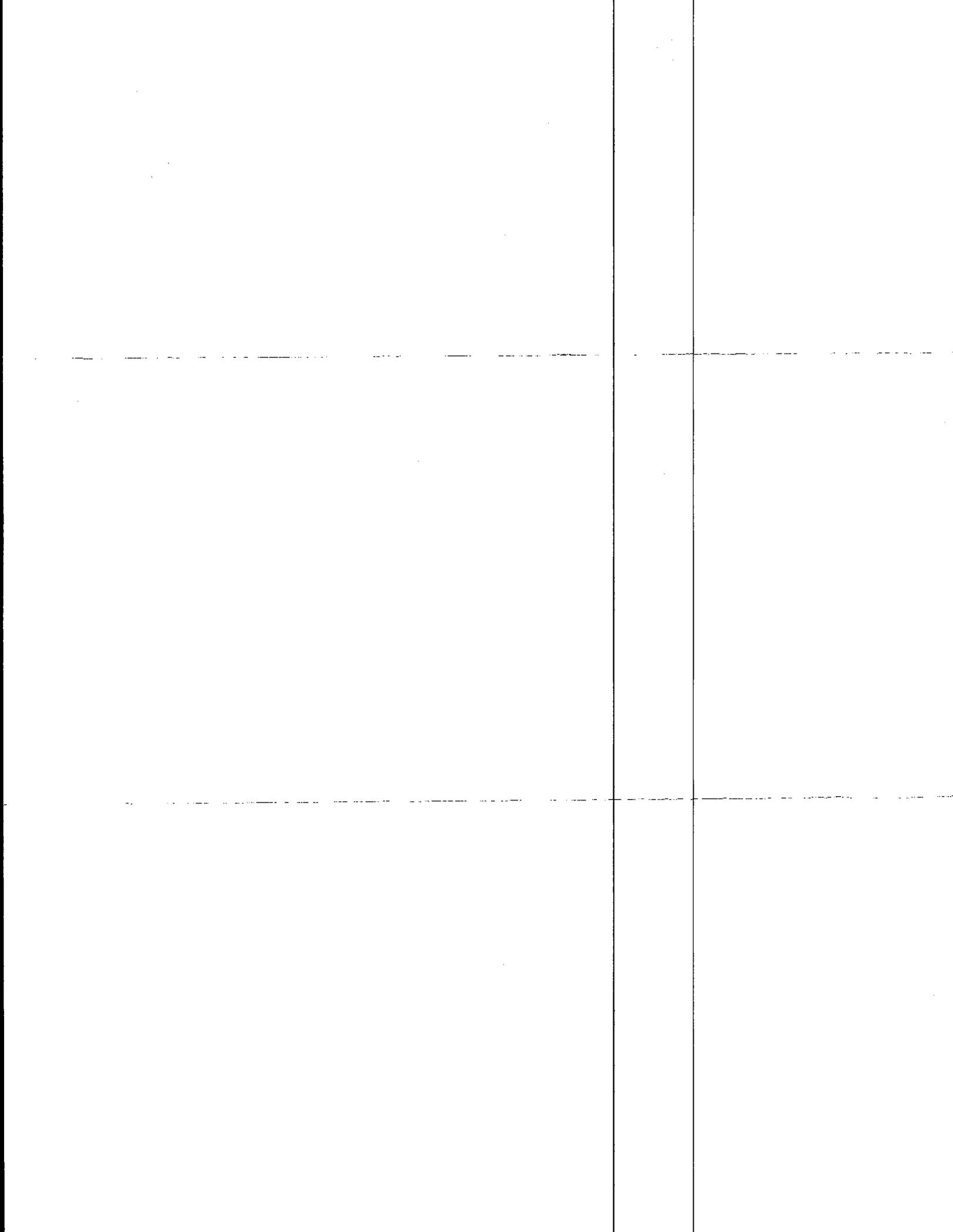
Morro Bay's natural beauty as a marine wildlife sanctuary is our main attraction. Any negative impact upon our marine life will affect not only our commercial fishing fleet, but all those businesses dependent upon tourism dollars; all the employees working for those tourism businesses; and all the other businesses where those employees spend their wages. The impact would have a ripple effect throughout our entire economy.

It is for these reasons the Morro Bay Chamber of Commerce joins C.O.A.S.T. (Citizens Opposing Acoustic Seismic Testing) in insisting that any permitting process cease.

Sincerely,

A handwritten signature in black ink, appearing to read "Craig Schmidt".

Craig Schmidt, CEO  
Morro Bay Chamber of Commerce  
Morro Bay, California



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September 24, 2012

SEP 26 2012

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CENTRAL COAST AREA

Dan Carl, Deputy Director  
California Coastal Commission  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Re: PG&E Diablo Canyon Seismic Testing

Position: Opposed

Dear Dan Carl,

The Diablo Canyon seismic testing, proposed by PG&E, is a project that, if approved, will likely kill or drive away extensive wildlife, including whales, dolphins, fish, and marine life, throughout our central coastline.

As many local residents and businesses know, humpback and blue whales migrate to this area during the months of the proposed seismic testing. This migration takes place because of a healthy, central coast ecosystem. Disrupting the habitat of these whales and the entire ecosystem in the area will not only significantly affect marine habitat, the effect will also be felt by residents and business in the area, now and for years to come.

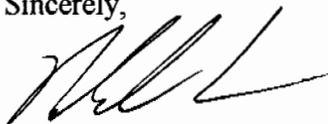
As Fish and Game Commission President, Jim Kellogg mentioned during the August 9<sup>th</sup>, 2012 Fish and Game Commission meeting, the disruptive air gun technology, proposed by PG&E for use in their seismic testing, may be the best technology available *today*. (Assuming PG&E is correct that air gun testing is, in fact, the best seismic testing technology available.) But PG&E should assume the responsibility of hearing the vehement opposition of both the people and the industry and seek out a more appropriate, less disruptive technology to accomplish the seismic testing.

After receiving significant opposition to PG&E's proposed seismic testing in the form of dozens of letters, over 44,000 emails, and dozens of speakers at the September 24<sup>th</sup>, 2012 Fish and Game Commission meeting, President Kellogg expressed that, "This is a marine life protected area, not a marine life killing area" and moved to recommend to the Department that they **do not** approve of this seismic testing. The Commission then, as a whole, followed by agreeing with their President and recommended that the Department **should not** approve PG&E's proposed testing.

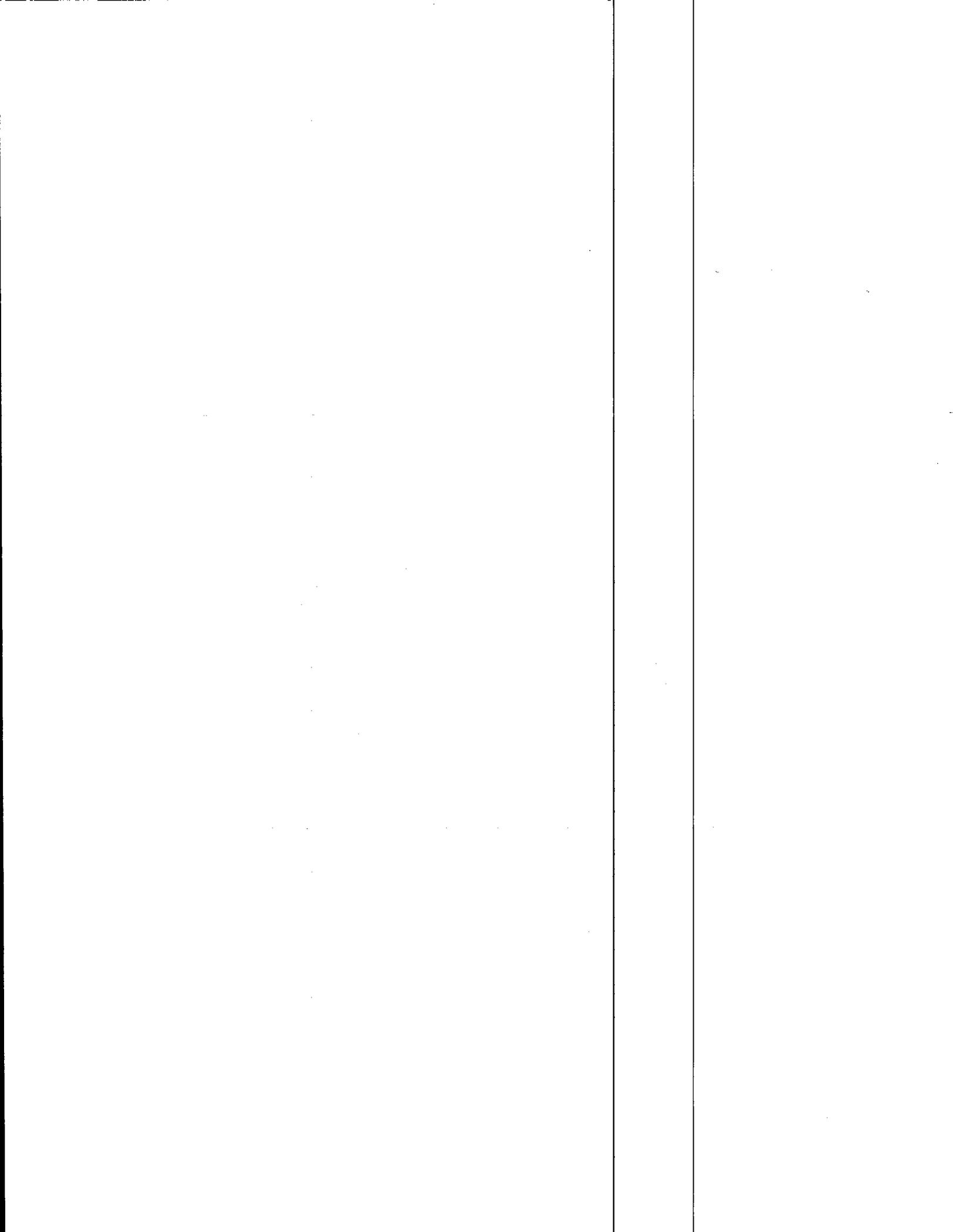
The central California coast is home to my family business as well as countless vacations, trips, memories, and the like. This beloved region is too fragile, both economically and biologically, to sustain the significantly disruptive seismic testing proposed by PG&E.

I ask you, as I and so many others have asked the California Fish and Game Commission, to please reject PG&E's proposed seismic testing in Diablo Canyon.

Sincerely,



Michael Lee, President





LANSHARKS CONSULTING

Kirk van Moon  
5960 Merriewood Drive  
Oakland, CA 94611

T 510-601-5475  
kirk@lansharks.net

www.lansharks.net

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SEP 25 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

September 23, 2012  
Dan Carl  
Deputy Director  
Central Coastal Commission, District Office  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Dear Mr. Carl,

Please. Don't. Allow. Seismic. Testing. At. Diablo Canyon.

In doing so, it appears countless marine wildlife will be harmed and/or killed. I have a hard time believing PG&E would be allowed to do anything so stupid. If this is for real, please stop it.

As an avid surfer, kite surfer and ocean lover, I look to you, the Coastal Commission to manage corporations who may put their own cause in front of rational and humane thinking.

If there are other organizations or individuals I should be contacting on this matter, I expect to hear from you. My email address is above and is a good way to reach me.

Thank you very much,

Kirk van Moon

<p>1. The first part of the document discusses the importance of maintaining accurate records in a business setting. It highlights how proper record-keeping can help in decision-making and provide a clear history of operations.</p> <p>2. The second part of the document focuses on the legal implications of record-keeping. It explains that businesses are often required by law to maintain certain types of records for a specific period of time.</p> <p>3. The third part of the document discusses the challenges of record-keeping in a digital age. It notes that while digital records are convenient, they also pose risks such as data loss and security breaches.</p> <p>4. The fourth part of the document provides practical advice on how to implement a robust record-keeping system. It suggests using secure storage solutions and regular backups to protect data.</p> <p>5. The fifth part of the document concludes by emphasizing the long-term benefits of a well-maintained record-keeping system, including improved efficiency and compliance.</p>		

Noise from a single seismic airgun survey, used to discover oil and gas deposits hundreds of kilometers under the sea floor, can blanket an area of over 300,000 km<sup>2</sup>, raising background noise levels 100-fold (20 dB), continuously for weeks or months (IWC 2005, IWC 2007). Since this exposes large portions of a cetacean population to chronic noise, the International Whaling Commission's Scientific Committee noted "...repeated and persistent acoustic insults [over] a large area...should be considered enough to cause population level impacts." (IWC 2005).

Nieukirk et al. (2012) analyzed 10 years of recordings from the Mid-Atlantic Ridge, finding that seismic airguns were heard at distances of 4,000 km from survey vessels and present 80-95% of the days/month for more than 12 consecutive months in some locations. When several surveys were recorded simultaneously, whale sounds were masked (drowned out), and the airgun noise became the dominant part of background noise levels.

To compare the total energy output per year (in joules) of the various human-made noise sources, the highest is 2.1 x 10<sup>15</sup> J, representing the contribution from nuclear explosions and ship-shock trials (explosions used by the Navy to test the structural integrity of their ships). Immediately following in contribution are seismic airgun arrays at 3.9 x 10<sup>13</sup> J. Next, are military sonars (2.6 x 10<sup>13</sup> J) and supertankers, merchant vessels, and fishing vessels at 3.8 x 10<sup>12</sup> J (Hildebrand 2005).

#### Marine mammals

Gordon et al. (2004) found that marine mammals can be impacted by the intense, broadband pulses produced by seismic airguns through hearing impairment (temporary or permanent threshold shift, TTS or PTS), physiological changes such as stress responses, indirectly by impacting their prey, behavioral alterations such as avoidance responses, displacement, or a change in vocalizations, or through masking (obliterating sounds of interest). Humpback and fin whales appear to communicate over distances of at least tens of kilometers (e.g. Watkins and Schevill 1979), so reducing this distance would compromise their ability to communicate.

Around 250 male fin whales appeared to stop singing for several weeks to months during a seismic survey, resuming singing within hours or days after the survey ended (International Whaling Commission 2007). Assuming male fin whale songs have a reproductive function, such as attracting and finding mates (Croll et al. 2002), it would be difficult to believe that such an effect would not be biologically significant. McDonald et al. (1995) noted that a blue whale stopped calling in the presence of a seismic survey 10 km away.

A different blue whale population showed the opposite reaction. Even a seismic survey using a low-to-medium power sparker caused blue whales in the St. Lawrence Estuary to modify their vocalizations (Di Iorio and Clark 2010). Blue whales called consistently more on days when the seismic survey was operating than when not, and more during periods within those days in which the sparker was on vs. off. The number of blue whale calls increased within the 1-hr block after sparker onset. The authors postulated that the blue whales were attempting to compensate for the additional introduction of noise, and noted that whales probably received a fairly low level of noise (131 dB re 1 mPa (peak to peak) over 30-500 Hz, with a mean sound exposure level of 114 dB re 1  $\mu$ Pa<sup>2</sup> s). Thus, they suggested that even low source level seismic survey noise could interfere with important signals used in social interactions and feeding (Di Iorio and Clark 2010).

Marine mammals also avoid seismic noise by vacating the area. Castellote et al. (2012) showed extended displacement of fin whales by a seismic survey which lasted well beyond the survey length. Weir (2008) found that Atlantic spotted dolphins showed stronger responses to seismic airgun exposure than humpback or sperm whales. These dolphins were found significantly farther away from the airguns when they were on vs. off and only approached the seismic vessel when the airguns were silent. An analysis of cetacean responses to 201 seismic surveys in UK waters exhibited evidence of disturbance (Stone and Tasker 2006). During active seismic surveying, all small odontocetes, killer whales, and all mysticetes were found at greater distances from the seismic vessel than when it was not shooting. Small odontocetes showed the greatest horizontal avoidance, which reached to the limit of visual observation. Sighting rates for mysticetes, sperm whales, pilot whales, and killer whales did not decrease when airguns were off vs. on, but mysticetes and killer whales showed localized avoidance. During seismic shooting, fewer animals appeared to be feeding, smaller odontocetes seemed to swim faster, and mysticetes appeared to remain longer at the surface where sound levels are lower. Reactions were stronger to larger volume seismic

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arrays. Stone and Tasker (2006) theorized that smaller odontocetes may vacate the area entirely during exposure to seismic, whereas slower-moving mysticetes may remain in the area, simply increase their distance from the noise.

Responses can differ according to context, sex, age class, or species. Bowhead whales avoided seismic air-gun noise at received levels of 120–130 dB (rms over pulse duration) during their fall migration, though they were much more tolerant of noise when feeding in the summer, staying away from levels of 158–170 dB, which are roughly 10 000 times more intense (Richardson et al. 1995, 1999). Humpback cows and calves in key habitat evaded seismic air guns at 140–143 dB re 1  $\mu$ Pa mean squared pressure, which was lower than the reaction of migrating humpbacks at 157–164 dB re 1  $\mu$ Pa mean squared pressure (McCauley et al. 2000). Species with similar hearing capabilities and audiograms showed markedly different responses to airgun noise off British Columbia, with harbor porpoises appearing to be the most sensitive, responding to seismic noise at distances of >70 km, at received levels of <145 dB re 1  $\mu$ Pa rms (Bain and Williams 2006; International Whaling Commission 2007).

Reactions to seismic airguns can also be quite subtle and hard to detect. Sperm whales in the Gulf of Mexico did not appear to avoid a seismic airgun survey, though they significantly reduced their swimming effort during noise exposure along with a tendency toward reduced foraging (Miller et al 2009). Miller et al. (2009) tagged 8 sperm whales with tags recording sounds and movement while exposing them to operating airgun arrays. The longest resting bout ever observed in any sperm whale (265 min.) happened to the whale most closely approached by the actively firing seismic survey vessel, with the whale finally diving 4 min. after the final airgun pulse. Whales significantly reduced their fluke stroke effort by 6% during exposure to seismic noise compared with after, and all seven sperm whales studied reduced their fluke strokes on foraging dives in the presence of seismic noise. Moreover, there were indications that prey capture attempts were 19% lower during airgun noise exposure (Miller et al. 2009). The authors note that even small reductions in foraging rate could result in lower reproductive rates and have negative consequences for the population.

Though summering bowheads showed no detectable avoidance of seismic surveys, no change in general activities or call types, and no obvious alteration of calling rate, they dove for shorter periods and their respiration rate was lower than non-exposed bowheads (Richardson et al. 1986). Such changes were observed up to 54–73 km from seismic surveys at received levels that could be as low as <125 dB re 1  $\mu$ Pa (Richardson et al. 1995).

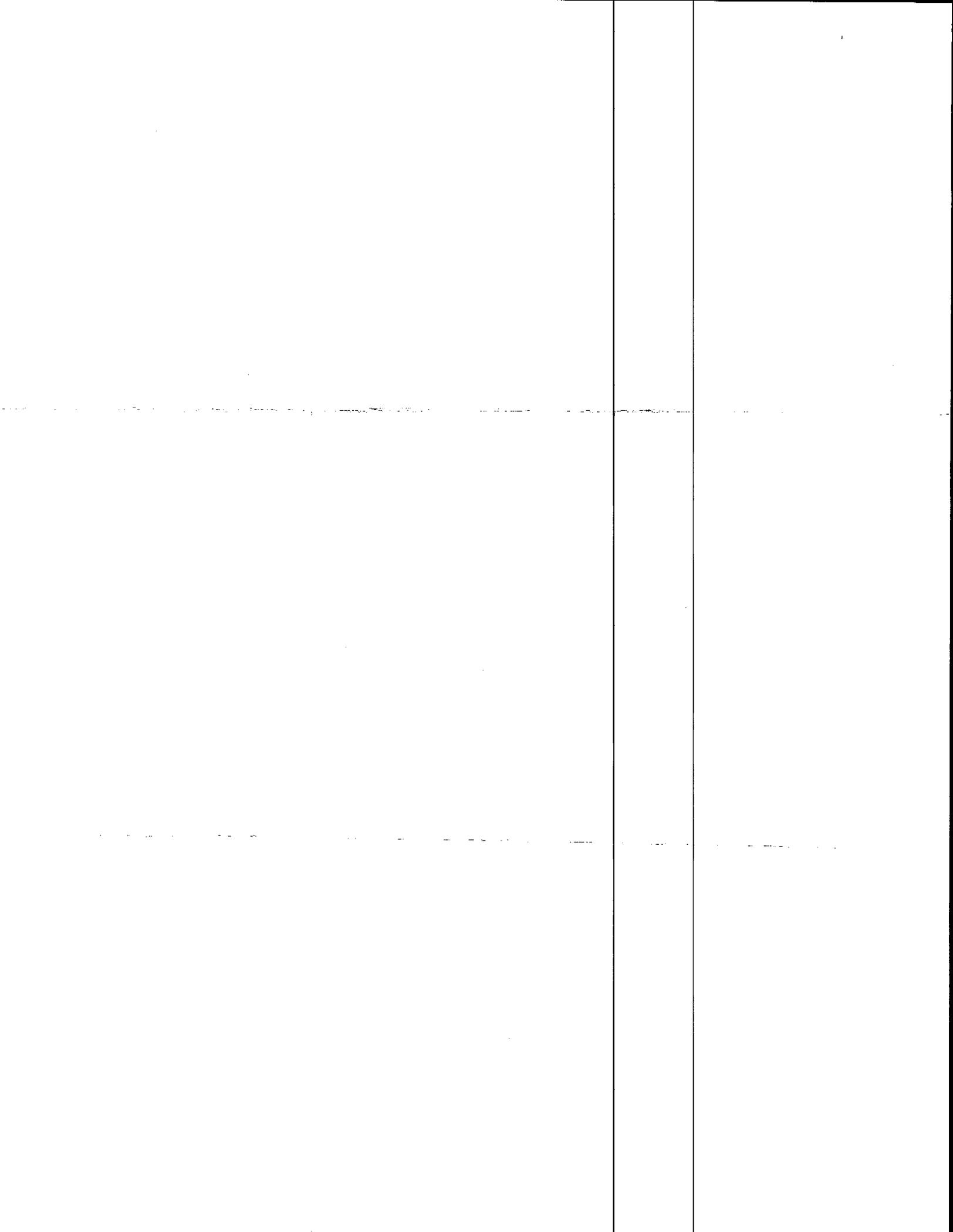
Seismic noise has been thought to at least contribute to some species' declines or lack of recovery (Weller et al. 2006a, 2006b; International Whaling Commission 2007). Critically endangered western gray whales off Sakhalin Island, Russia, were displaced by seismic surveys from their primary feeding area, returning only days after seismic activity stopped (International Whaling Commission 2005). This change in distribution closely followed the timing of the seismic surveys (International Whaling Commission 2005, 2007; Weller et al. 2006a). Whales exposed to seismic noise levels of about 153 dB re 1  $\mu$ Pa zero-to-peak and 159 dB peak-to-peak on their feeding grounds also swam faster and straighter over a larger area with faster respiration rates during seismic operations (Weller et al. 2006b; International Whaling Commission 2007).

Parente et al. (2007) discovered a reduction in cetacean species diversity with increasing numbers of seismic surveys during 2000 and 2001 off Brazil, despite no significant oceanographic changes in this period. Between 1999 and 2004, there was a negative relationship between cetacean diversity and the intensity of seismic surveys.

When exposed to a single airgun or small airgun array, gray seals showed avoidance and switched from foraging to transiting behavior. They also began hauling out, possibly to escape the noise. Harbor seals exhibited a slowing of their heart rate together with dramatic avoidance behavior and stopped feeding (Thompson et al. 1998).

Seismic air guns are a probable cause of whale strandings and deaths as well, especially in beaked whales (Hildebrand 2005). A stranding of two individuals was tied very closely in space and time to a seismic survey in the Gulf of California. Even if impacts are fatal, only 2% of all cetacean carcasses are detected, on average (Williams et al. 2011). The authors state that for cryptic mortality events such as acoustic trauma, analytical methods are necessary to take into consideration the small percentage of carcasses that will be recovered.

A pantropical spotted dolphin suffered rigidity and postural instability progressing to a catatonic-like state and



probable drowning within 600 m of a 3D seismic survey firing at full power (Gray and Van Waerebeek 2011). The authors explained the initial aberrant behavior by a possible attempt by the dolphin to shield its sensitive rostrum and hearing structures from the intense acoustic energy of the airguns, by lifting its head above the water's surface. They believed the seismic survey could have caused this observed behavior, presumably resulting from severe acoustic distress and even injury.

Other explanations were examined and considered less likely (Gray and Van Waerebeek 2011).

Stress effects or physiological changes, if chronic, can inhibit the immune system or otherwise compromise the health of animals. These can be very difficult to detect in cetaceans. Indications of increased stress and a weakened immune system following seismic noise broadcasts were shown for a whale and dolphin (Romano et al. 2004). Loud, impulsive noise produced from a seismic water gun caused significantly increased mean norepinephrine, epinephrine, and dopamine levels immediately after a high, but not low-level exposure in a captive beluga whale (Romano et al. 2004). All three of these stress hormones increased significantly with increasing noise levels. These hormone levels remained high even 1 hour after noise exposure, which is surprising given their short half-life, according to the authors. In a captive bottlenose dolphin, the seismic water gun produced significant neuro-immune values, namely increases in aldosterone and a decrease in monocytes. Aldosterone is one of the principal stress hormones in cetaceans and may surpass cortisol as a more sensitive indicator of stress (Romano et al. 2004).

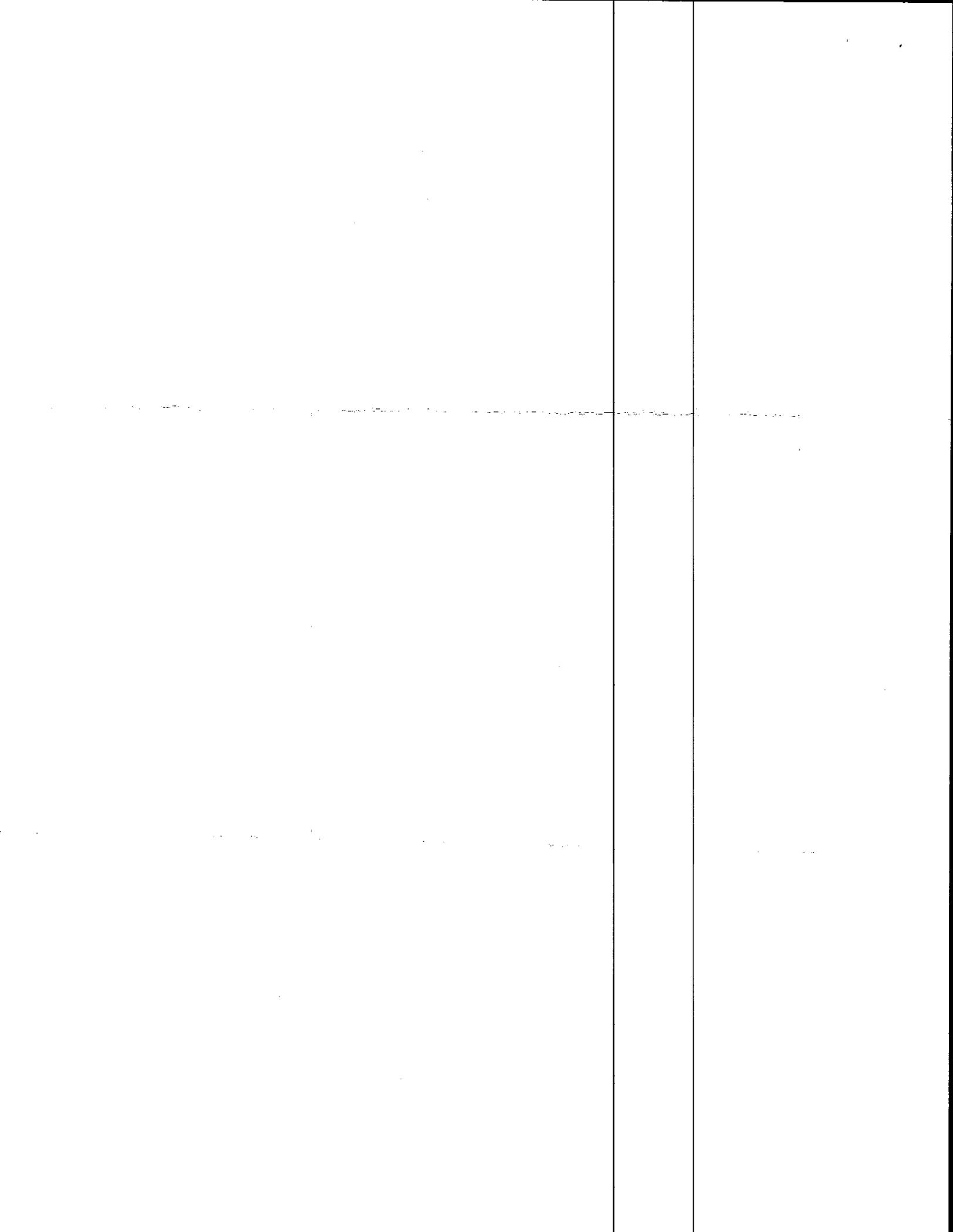
Mitigation measures to safeguard whales against high noise exposures are very inadequate. Generally, only the area within 500 m of the seismic vessel is observed, yet high noise levels can occur at much greater distances. Madsen et al. (2006) discovered that in the Gulf of Mexico received levels can be as high at a distance of 12 km from a seismic survey as they are at 2 km (in both cases >160 dB peak-to-peak). Received levels, as determined from acoustic tags on sperm whales, generally fell at distances of 1.4 to 6–8 km from the seismic survey, only to increase again at greater distances (Madsen et al. 2006).

Moreover, determining an exposure level that is "safe" for marine mammals is fraught with difficulty. For instance, a harbor porpoise exposed to airgun pulses was found to have lower (more sensitive) masked TTS levels than any other cetacean that has been tested, namely 164.3 dB re 1  $\mu\text{Pa}^2\cdot\text{s}$  SEL or 199.7 dB pk-pk re 1  $\mu\text{Pa}$  (Lucke et al. 2009). The noise level required to cause hearing loss (temporary threshold shift or TTS) in whales is still very uncertain, especially for seismic airguns, as there are so few empirical measurements. Between-individual variability, the population's average sensitivity (how representative of the population was the tested animal), and the validity of extrapolating between species, particularly between captive small dolphins or porpoises (on which the few tests have been done) to free-ranging large baleen whales are all unknown. Gedamke et al. (2011) model how various factors and assumptions can change the percentage of whales exposed to damaging levels. When factoring in uncertainty and sources of variability, 29% (10–62%) of whales within 1–1.2 km of a seismic survey would experience levels sufficient to produce TTS onset. Without considering these factors, no whales beyond 0.6 km would be at risk for TTS, showing how even fairly small degrees of uncertainty can have a large effect on risk assessment (Gedamke et al. 2011). If management decisions are to be based on so little data, uncertainty must be taken into consideration. At close ranges, avoidance by whales of the seismic survey actually increased their exposure slightly as their speed was slower than the seismic vessel. Overall, Gedamke et al. (2011) concluded that TTS in baleen whales is plausible at ranges up to several kilometers.

Many (36–57%) of the stranded or entangled dolphins or toothed whales have been shown to have profound hearing loss, implying that impaired hearing could have led to their stranding/entanglement (Mann et al. 2010).

#### Marine Turtles

Marine turtles show a strong initial avoidance response to air-gun arrays at a strength of 175 dB re 1  $\mu\text{Pa}$  rms or greater (O'Hara and Wilcox 1990; McCauley et al. 2000; Lenhardt 2002). Enclosed turtles also responded progressively less to successive airgun shots which may indicate reduced hearing sensitivity (TTS). One turtle experienced a TTS of 15dB, recovering two weeks later (Lenhardt 2002). McCauley et al. (2000) estimated that a typical airgun array operating in 100–120 m water depth could impact behavior at a distance of about 2 km and cause avoidance at around 1 km for marine turtles. DeRuiter and Doukara (2010) found that 51% of turtles dived at or before their closest point of approach to an airgun array.



## Fish

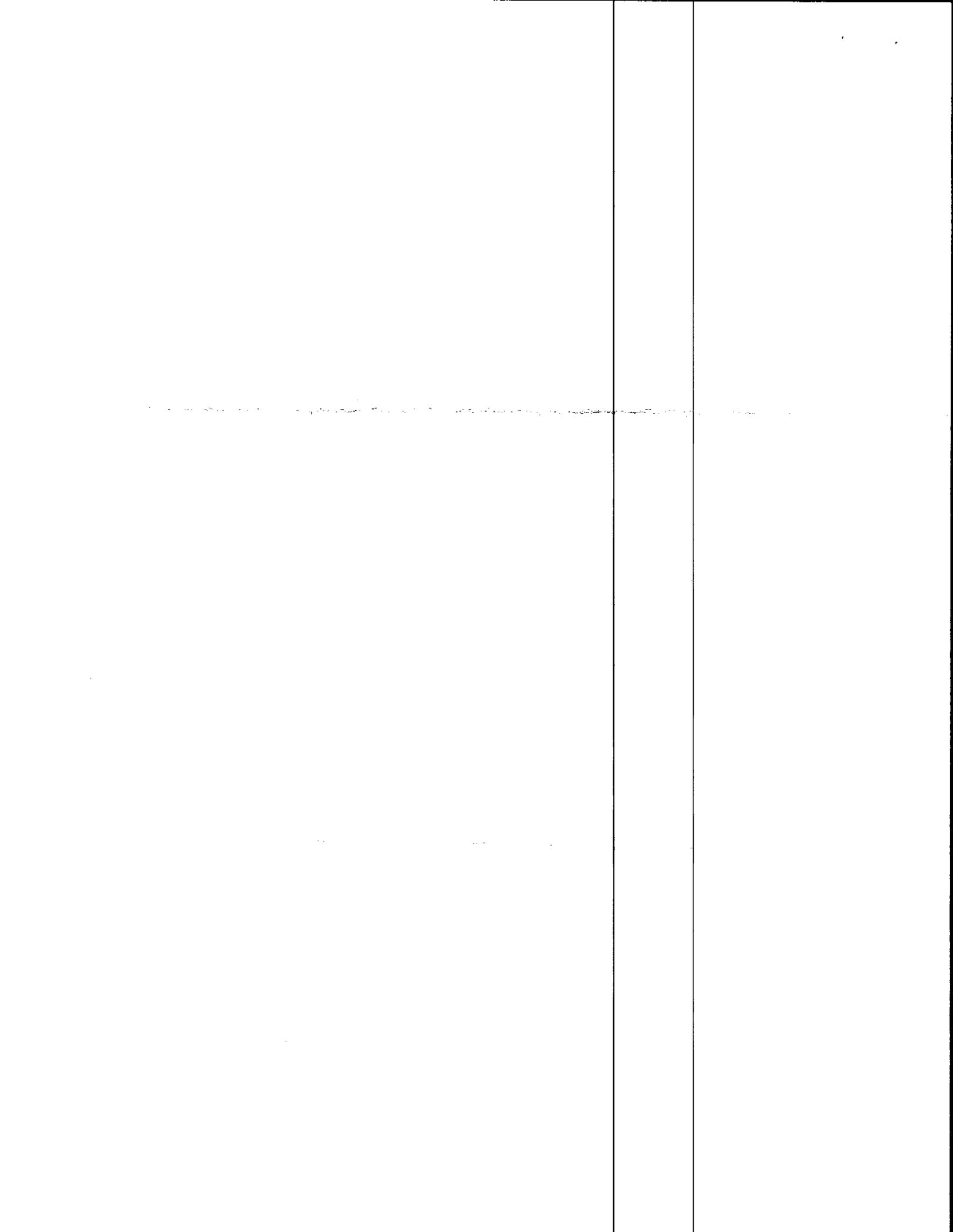
A wide range of acoustic impacts on fish has been observed. Seismic air guns extensively damaged fish ears at distances of 500 m to several kilometres from seismic surveys. No recovery was apparent 58 days after exposure (McCauley et al. 2003). Behavioral reactions of fish to anthropogenic noise include dropping to deeper depths, milling in compact schools, "freezing", or becoming more active (Dalen and Knutsen 1987; Pearson et al. 1992; Skalski et al. 1992; Santulli et al. 1999; McCauley et al. 2000; Slotte et al. 2004). Reduced catch rates of 40%–80% and decreased abundance have been reported near seismic surveys in species such as Atlantic cod, haddock, rockfish, herring, sand eel, and blue whiting (Dalen and Knutsen 1987; Løkkeborg 1991; Skalski et al. 1992; Engås et al. 1996; Hassel et al. 2004; Slotte et al. 2004). These effects can last up to 5 days after exposure and at distances of more than 30 km from a seismic survey. The impacts of seismic airgun noise on eggs and larvae of marine fish included decreased egg viability, increased embryonic mortality, or decreased larval growth when exposed to sound levels of 120 dB re 1  $\mu$ Pa (Kostyuchenko 1973; Booman et al. 1996). Turbot larvae showed damage to brain cells and neuromasts (Booman et al. 1996). Neuromasts are thought to play an important role in escape reactions for many fish larvae, and thus their ability to avoid predators. Increases in stress hormones have been observed in fish due to noise (Santulli et al. 1999).

## Invertebrates

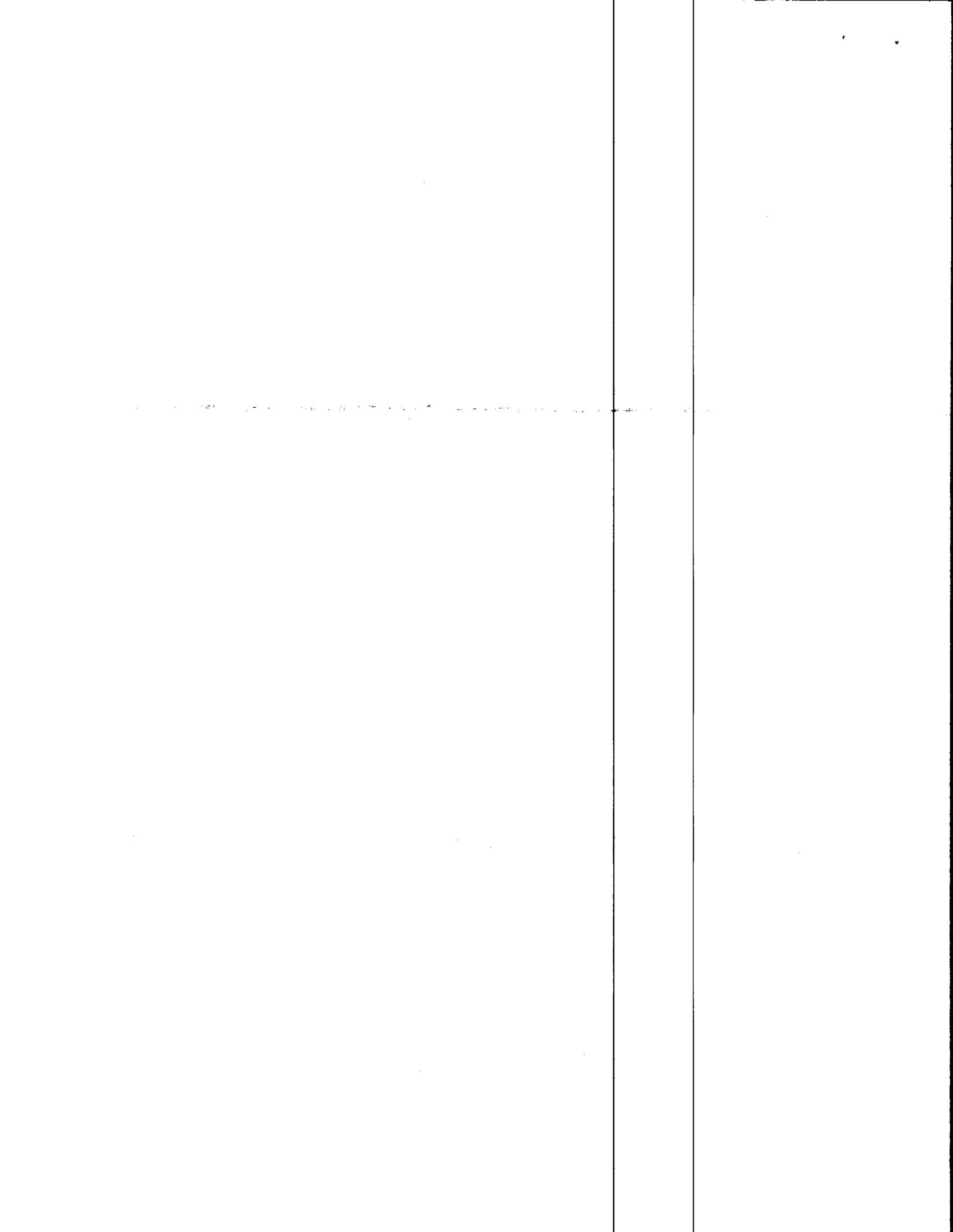
Invertebrates also do not appear to be immune from the effects of anthropogenic noise. Nine giant squid mass stranded, some of them live, together with geophysical surveys using air guns in 2001 and 2003 in Spain (Guerra et al. 2004). The squid all had massive internal injuries, some severe, with internal organs and ears badly damaged. Another species of squid exposed to airgun noise showed an alarm response at 156–161 dB rms and a strong startle response involving ink ejection and rapid swimming at 174 dB re 1  $\mu$ Pa rms (McCauley et al. 2000). Caged squid also tried to avoid the noise by moving to the acoustic shadow of the cage. McCauley et al. (2000) suggest that the behavioral threshold for squid is 161–166 dB rms. A bivalve, *Paphia aurea*, showed acoustic stress as evidenced by hydrocortisone, glucose, and lactate levels when subjected to seismic noise (Moriyasu et al. 2004). Catch rates also declined with seismic noise exposure in *Bolinus brandaris*, a gastropod, the purple dye murex (Moriyasu et al. 2004). In snow crab, bruised ovaries and injuries to the equilibrium receptor system or statocysts were also observed (Department of Fisheries and Oceans 2004). Seismic noise-exposed crabs showed sediments in their gills and statocysts, and changes consistent with a stress response compared with control animals.

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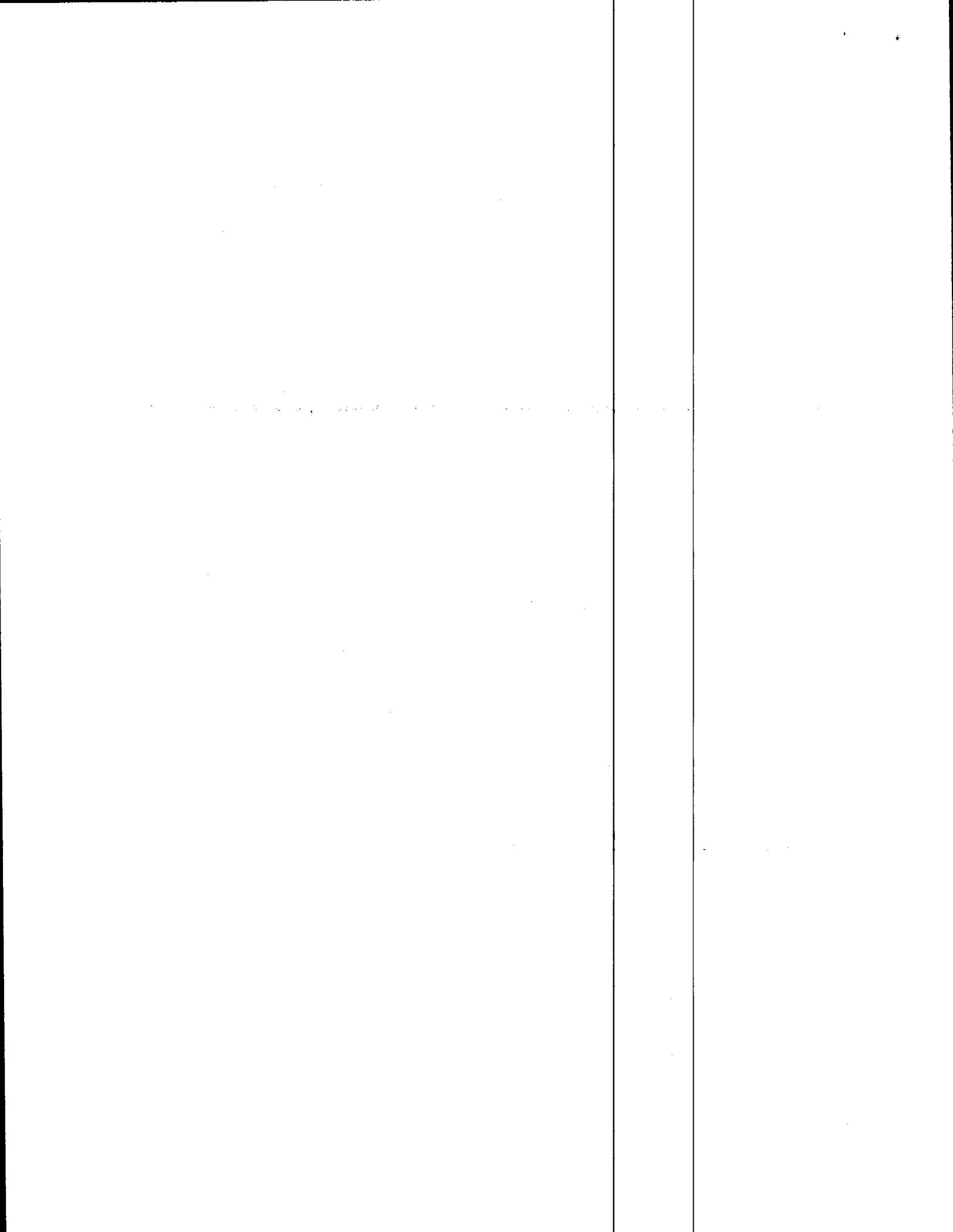
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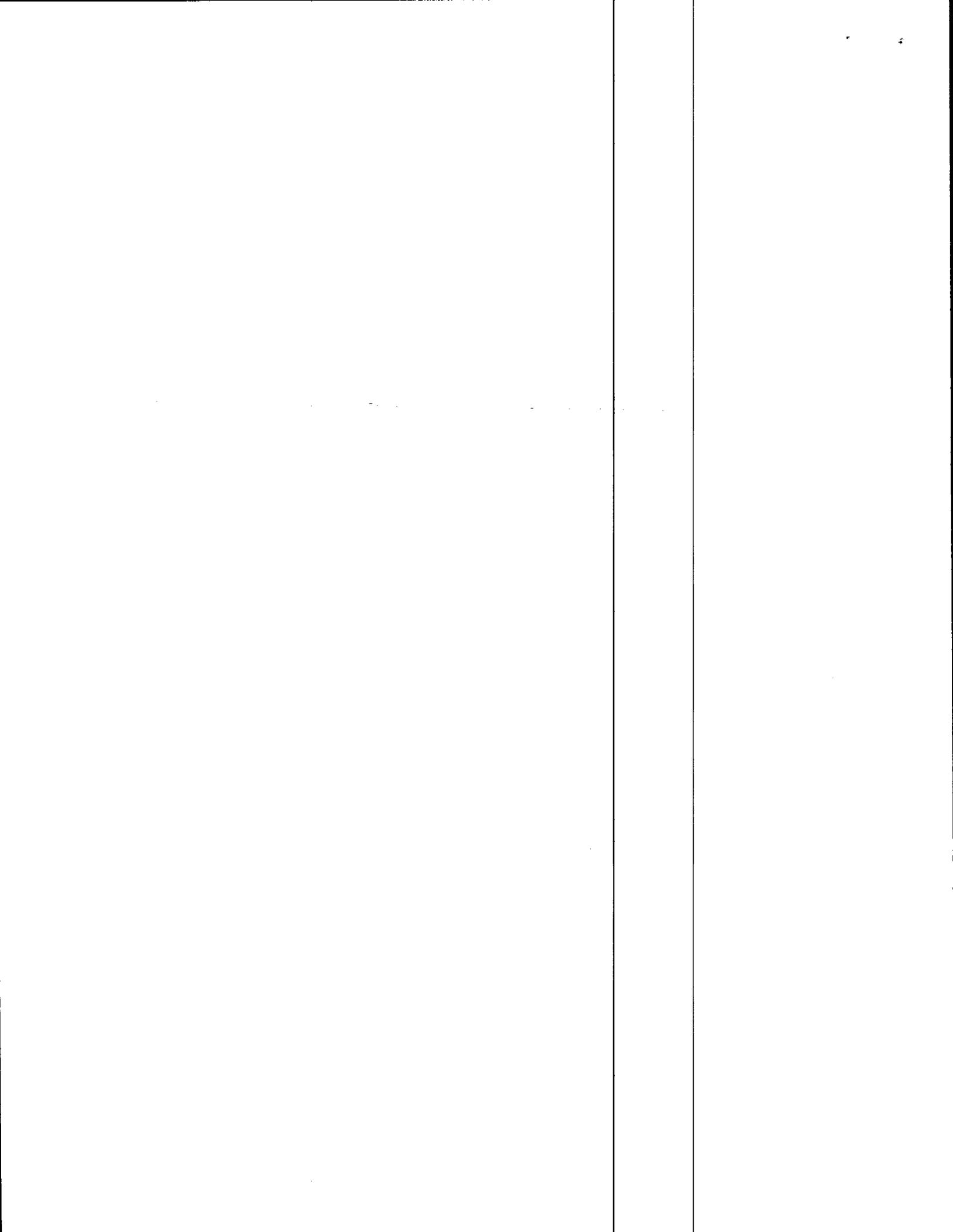
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Mr. Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont Street, Suite 2000  
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Sarah Christie, Legislative Liaison  
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RE: PERMIT FOR A 3-D HIGH ENERGY OFFSHORE SEISMIC  
REFLECTION SURVEY, CENTRAL COAST CALIFORNIA SEISMIC  
IMAGING PROJECT near the Diablo Canyon Nuclear Power Plant

I respectfully request that this letter be included in the public record for the  
Commissioners review.

**Sept. 18 2012**

**Dear Commissioners;**

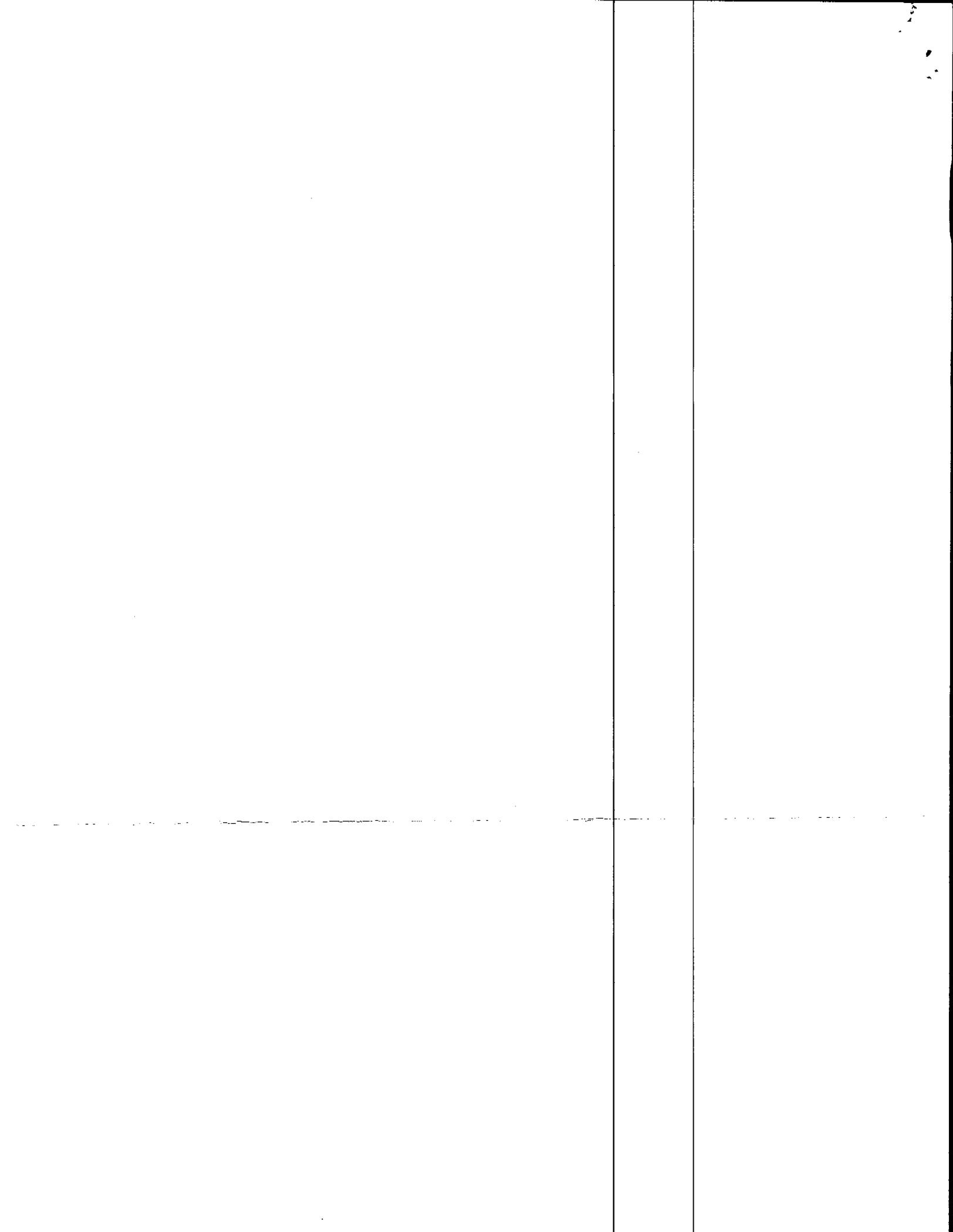
I have prepared this letter on behalf of 150 commercial fishing businesses.  
Each boat and crew represents a small business in the County of San Luis  
Obispo.

We are opposed to the seismic project proceeding without a better  
understanding of the impacts that this study will cause. We feel that there is  
no need to rush a study that will not solve the problem. Diablo is on an  
earthquake fault and will remain so. We would like to see a study that  
doesn't decimate the ocean environment as well as the local businesses  
who rely on a healthy ocean. There are many studies that prove physical  
damage to fish and their larvae. There is also documentation that details the  
loss of catch during seismic surveys in many fisheries. This issue is briefly  
mentioned and under reported in the EIR.

The following has been supplied to PG&E in writing, and to date have no  
comments either written or oral from their negotiation team.

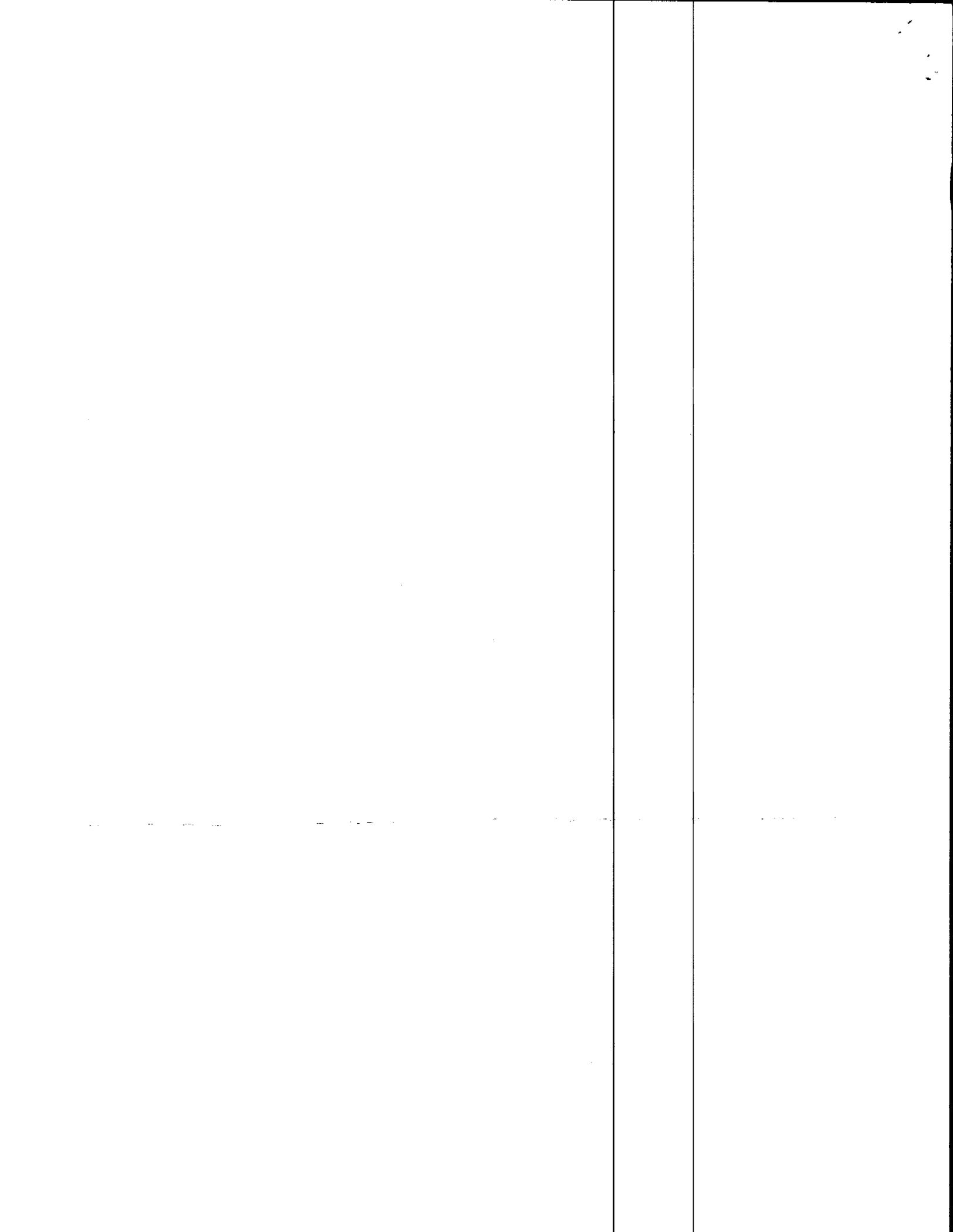
**The differences between Fishermen and PG&E August 24, 2012**

- 1] The fishermen are concerned about the blocks outside the racetrack.
  - A] The seismic blasting decreases hook and line, trawl, trap and net fishing to a minimum of 30 miles..
  - B] Displacement of mammals to active fishing areas. The DNG may be unable to fish due to increased whales outside their normal feeding

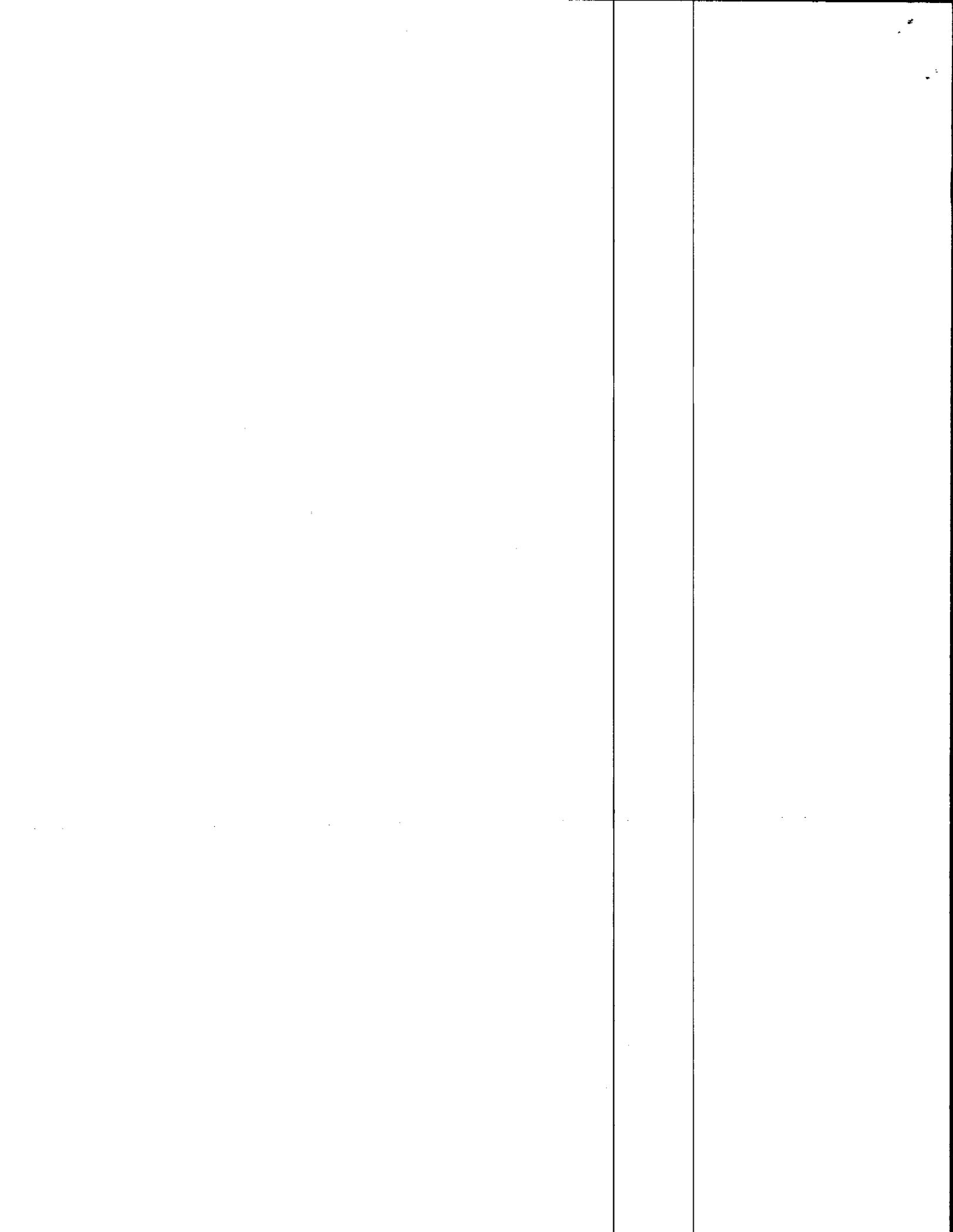


areas. Sea lions will predate hook and line and nets.

- C) Mammals may suffer damage to their sensory faculties that make them susceptible to interacting with fishing gear. [NMFS letter to State Lands Commission]
- 2) 2011 landing tickets are not being used for mitigation consideration, while being almost 33% higher than 2010. SLO County fish landing's having increased steadily from 2007, the first year of the four year basis that is being used by PG&E. (KSBY news broadcast, Aug 30<sup>th</sup>, 2012). The fishermen hired Lisa Wise and Assoc. to issue an updated economic report that details SLO County landings for 2011 for a cost of \$5,000 so current information could be considered.
  - 3) Near shore and deeper near shore permittees will be prevented from fishing because of safety zone restrictions and seismic blasting.
  - 4) Hagfish fishermen will be precluded from the race track and be unable to fish.
  - 5) Crab fishermen will be precluded from fishing in the racetrack when the season opens Nov. 15<sup>th</sup>. During the 2011 season almost all the crab was caught in the racetrack.
  - 6) Rock crab fishermen will be precluded from the race track.
  - 7) *PG&E's position that the seismic ships safety zone (4 miles by 9 miles, 36 sq. miles) will not disrupt the fleet entering and leaving the harbors. The survey ship will be moving between 2-3 knots and block the harbor for up to four hours a pass. Fishermen will not be able to work several days during certain phases of the survey. [I've seen two different safety zone dimensions]*
  - 8) After PG&E was presented information about income of effected fishermen they refused to accept the fact that they underestimated the value and scope of the damage their survey will cause.
  - 9) PG&E representatives have not returned phone calls and have been unwilling to discuss any plan for mitigation above the plan presented on faulty data almost a year ago. The fishermen have spent time and money that to this date has been wasted.



- 10] The fishermen want long term monitoring of both the fish and mammal stocks as well as the CPUE within the racetrack. This issue is being addressed by PG&E but we feel that it needs additional work with regard to peer review. This seismic survey is louder, shallower, and longer than any survey in California's history. We feel the **Coastal Commission** should specifically mandate the requirements for long monitoring within the permitting process.
- 11] Open access halibut and sea bass will be prevented from fishing in the racetrack as well as having their fishing effort impeded by harbor closures and noise during the seismic blasting.
- 12] An acceptable claims process should be in place prior to **Coastal Commission** permitting. This was done in 2000 when the fiber optic Cables were being installed. PG&E has made an informal offer to develop a claims process that will be used by fishermen. To date PG&E has declined to put anything in writing. PG&E wants to appoint a mediator to facilitate the process. The fishermen have no expertise or staff to prepare documentation. We are apprehensive that this will be used to our disadvantage. The agreement between the fiber optic cable companies and the fishermen paid for our representation during the negotiations of the MOU.
- 13] The State Lands Commission has only "suggested" certain monitoring criteria in their permit.
- 14] The first mention of closing the area from Cambria to Pt. Sal for swimming, kayaking and surfing was after the State Lands permitting process. (KSBY news Aug. 28<sup>th</sup>, 2012)
- 15] There has been no discussion of the projects impacts when it resumes in 2013.
- 16] Local fishing boats have an opportunity for guard boat and mammal duty. APCD is requesting using Tier-2 engines where "feasible". There are only 3-5 Teir-2 vessels in Morro Bay so we would expect that some vessels won't be Teir-2. We also feel that many of the local vessels will not be fishing because of restrictions to their normal fishing activities by the seismic study. This situation will create credits with APCD.



We have had several meeting with PG&E representatives with no results regarding our concerns. Three weeks ago John Shoals ( PG&E public relations representative) asked if the fishing organizations would consider mediation. We responded via email with a request that PG&E outline the process and goals.

1] We don't have a staff and are we expected to present what type of documentation during the process?

2] Is the mediation process going to evaluate all fisheries involved and determine a financial mitigation?

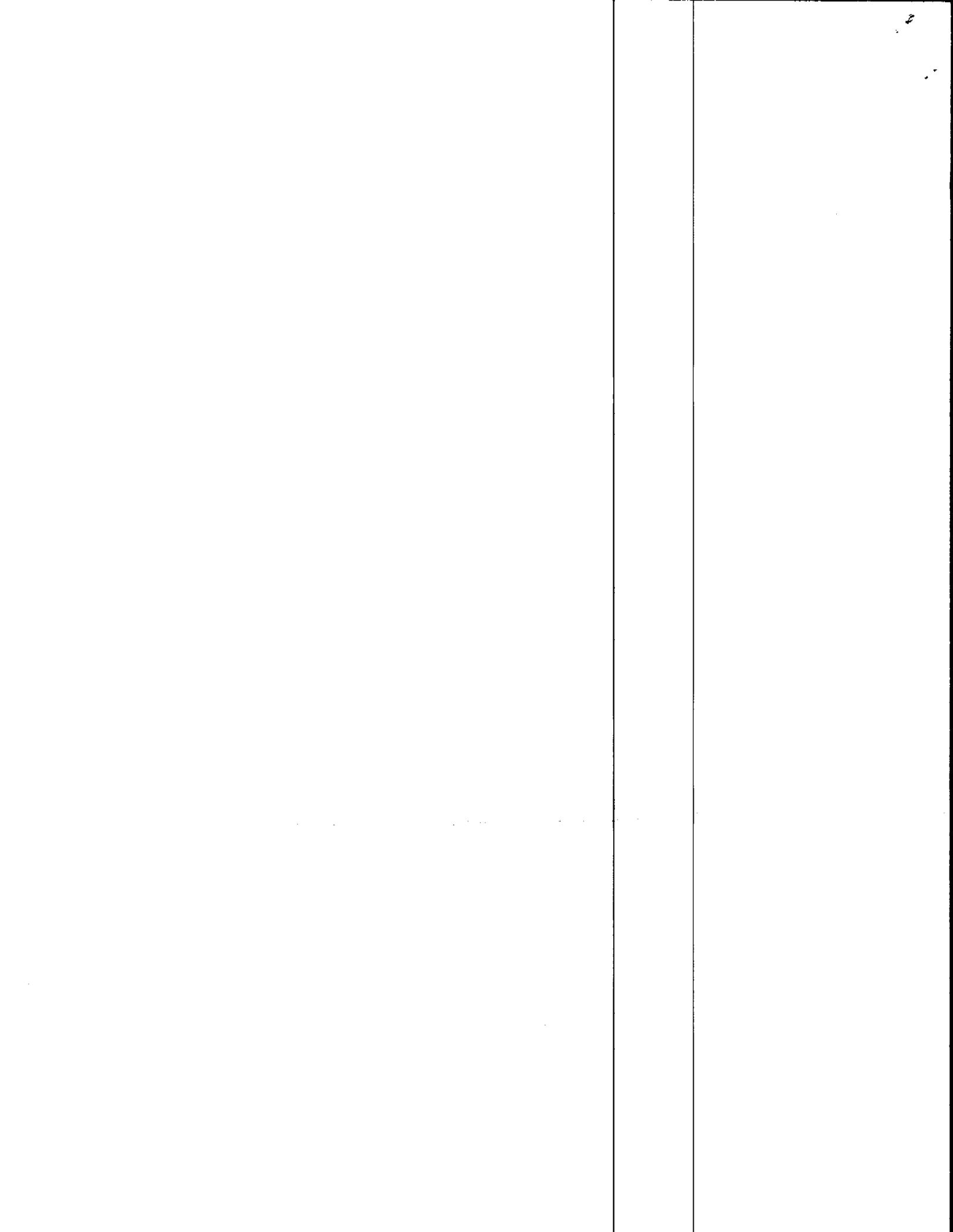
3] Will PG&E pay for professional assistance as did the fiber optic industry during the 2000 permitting and installation process. (ref; **California Coastal Commission** permit # F13b 04-14-2000 and Tu5a 06-13-2000 and reconfirmed for the AAG cable installation during 2007) The Coastal Commission included the Interim Agreement between Cable Companies and Fishermen as proof that the project wouldn't cause detrimental impacts to the fishing industry.

There is only three weeks until the **Coastal Commission** will be asked for approval of this seismic survey permit.

We respectfully request the **Coastal Commission** postpone the issuance of a permit until there is a binding agreement between PG&E and the fishing organizations in accordance with California State law.

Respectfully submitted

Thomas Roff  
785 Quintana Rd. #137  
Morro Bay CA 93442



Mr. Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

Sarah Christie, Legislative Liaison  
1121 "L" Street, Suite 503  
Sacramento, CA 95814

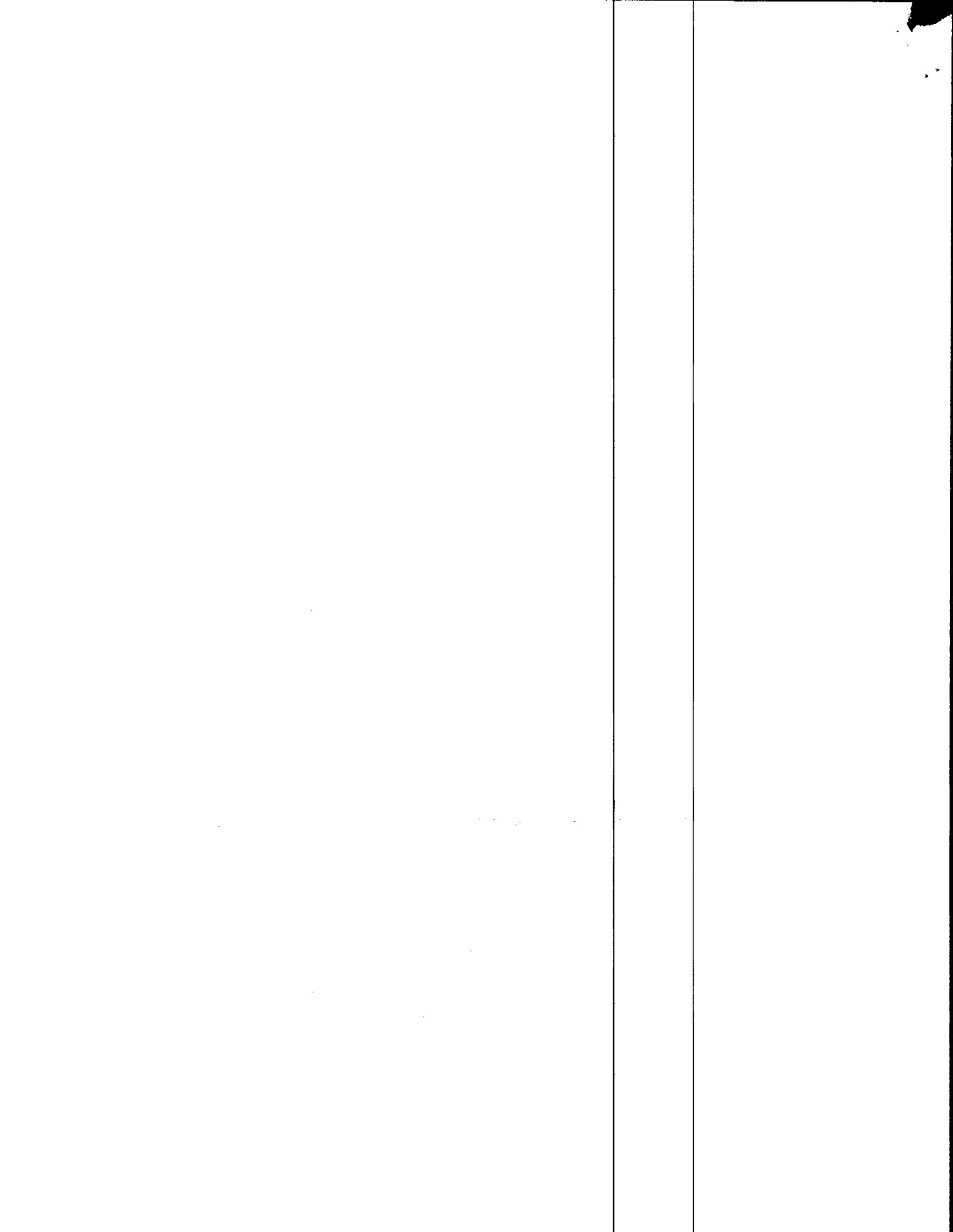
RE: PERMIT FOR A 3-D HIGH ENERGY OFFSHORE SEISMIC  
REFLECTION SURVEY, CENTRAL COAST CALIFORNIA SEISMIC  
IMAGING PROJECT near the Diablo Canyon Nuclear Power Plant

I'm writing on behalf of the 150 fishing vessel owners in Morro Bay and Port San Luis. This is the written request we gave to PG&E for discussion at our fishermen/PG&E meetings. Three weeks prior to the Commission hearing on their permit PG&E hasn't made any attempt to answer the question.

Port closures are inevitable! We have asked PG&E at every meeting for the answer to the following.

**How will the problem of leaving and entering the ports be resolved?**

After reading the following I know there will be times when the Seismic safety zone will prevent vessels from entering and leaving Morro Bay harbor and Port San Luis. How do we get compensation for lost days of fishing? The CEQA statement in MR-3 is vague. When we read the following it seems that the harbor entrances will be closed because of the Safety zone. Depending on the speed of the Survey vessel [2-3 Knts in some literature] that could be up to three hours. The same holds true for unloading appointments made for the afternoon. If I have a truck waiting I may not be able to enter the harbor in a timely fashion. This issue involves all fishermen that use both harbors. I just watched the CF&G meeting and PG&E's representative stated the harbors won't be closed. When you lay out the safety zone it will close both ports every time the ship passes. How do you plan on mitigating fishermen for their lost time/ days?



**The EIR states;**

Master Response MR-2, Restrictions on Vessel Traffic within Project Area during Project Implementation, clarifies the restrictions on vessels in the Project area. MR-2 also specifically states that harbors and ports will not be closed in relation to the proposed Project.

With respect to economic effects on fishery-related industry, please see MR-3, Treatment of Economic Losses in the EIR, which describes how socioeconomic effects are addressed in the EIR in accordance with the California Environmental Quality Act (CEQA).

The National Science Foundation (NSF), operators of the *R/V Langseth*, will request the USCG to issue a Notice to Mariners in advance of survey activities and make radio announcements that non-Project related vessels maintain the following distance while the *R/V Langseth* is conducting active survey operations:

- 3.2 km (2 mi) ahead,
- 8.8 km (5.5 mi) astern, and
- 4.8 km (3 mi) to the side when a ship or other vessel is passing the survey vessel.

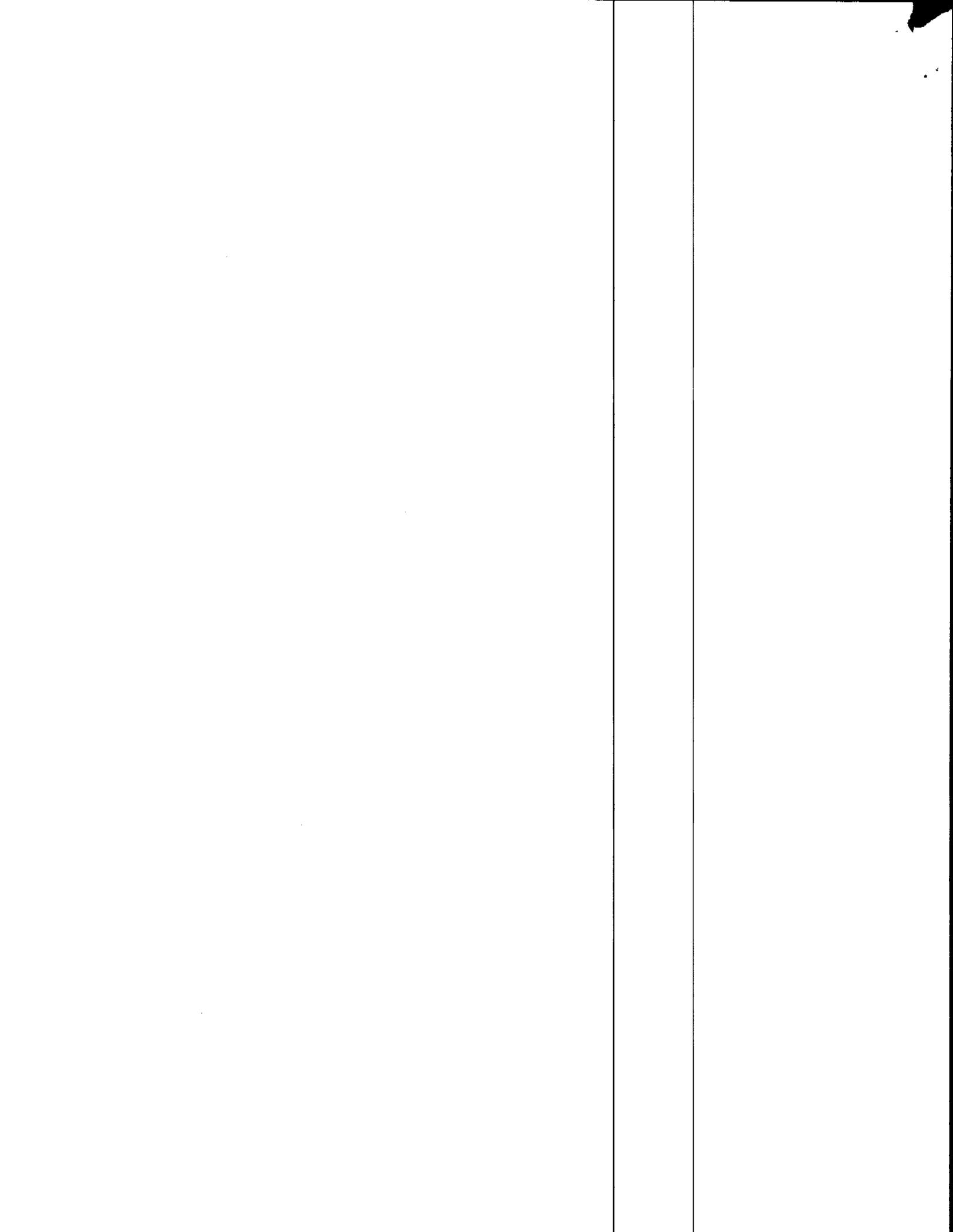
Regular communications will be provided on the location of the survey vessel pursuant to the approved Communication Plan (Mitigation Measure LU-1).

**At no time will local ports be closed by Project-related activities..**

**2. Survey Integrity.** The restrictions would reduce the potential for interferences from non-Project vessels that could affect the quality of the seismic data acquisition and/or the duration of the survey activities. For example, if a non-Project vessel were to cut across the path of the geophone streamer arrays being towed behind the survey vessel, it could result in **damage to the arrays as well as noise interference that would complicate interpretations** of the results. Another way in which a non-Project vessel could adversely affect data acquisition would be if that vessel caused the survey vessel to deviate from the survey track alignment to avoid a collision. In addition, both examples would have an adverse effect on the Project schedule (and environmental impacts) in that they would extend the period of time needed to complete the survey.

FEIR Section 2

With this in mind I'm concerned that fishermen, both recreational and commercial will have days that are non productive. December is the local gray whale watching season and the boats will have few if any whales to watch [according to NMFS document RIN 0648-XC072 Federal Register] as well as being unable to leave the harbor in a timely fashion. The local economy will have impacts that have yet to be addressed. We have asked PG&E at every meeting for an answer.



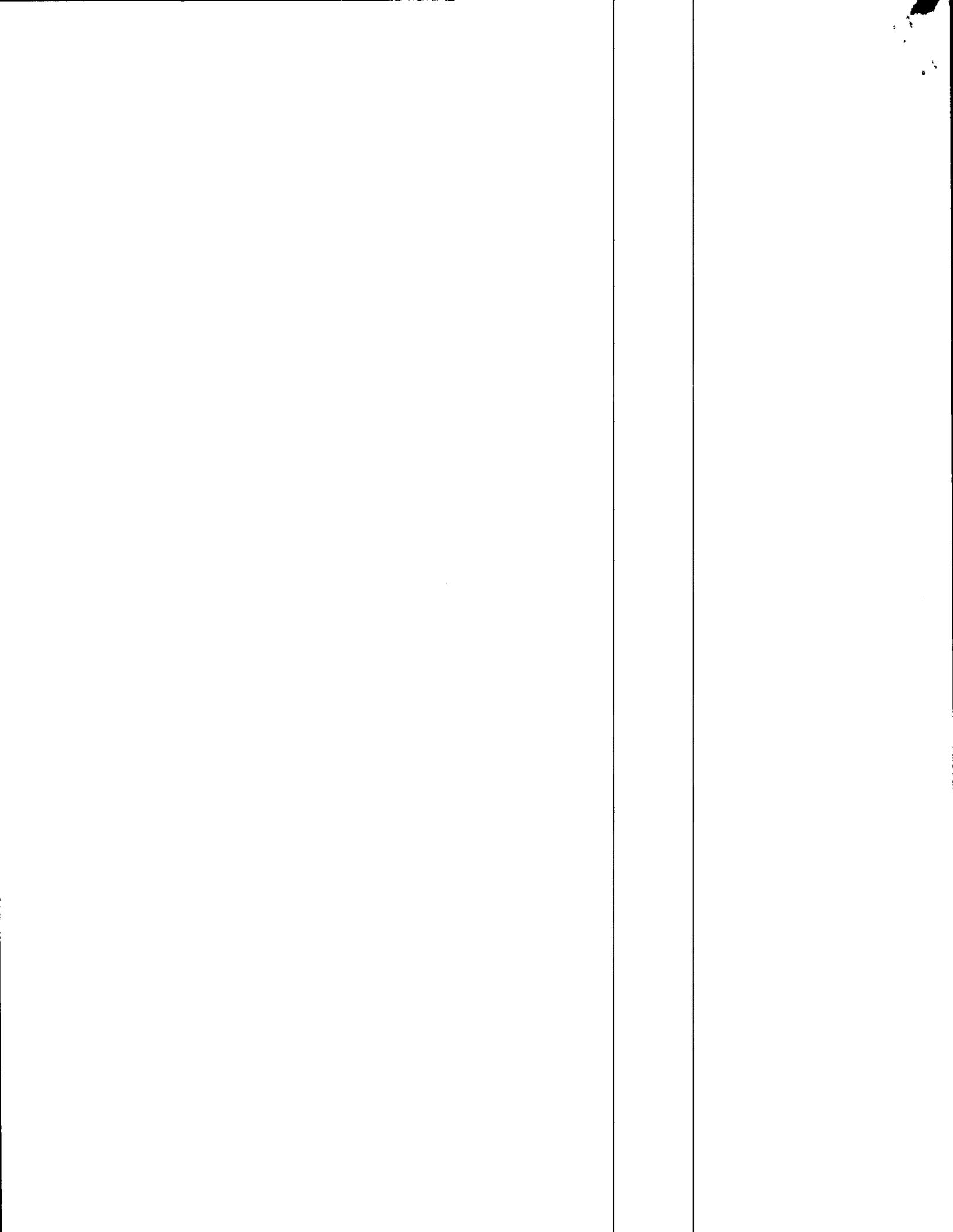
There are many small business owners as well as fishing vessel owners that will be financially impacted by this project.

We respectfully request that prior to any permit approval that PG&E be directed to answer this question.

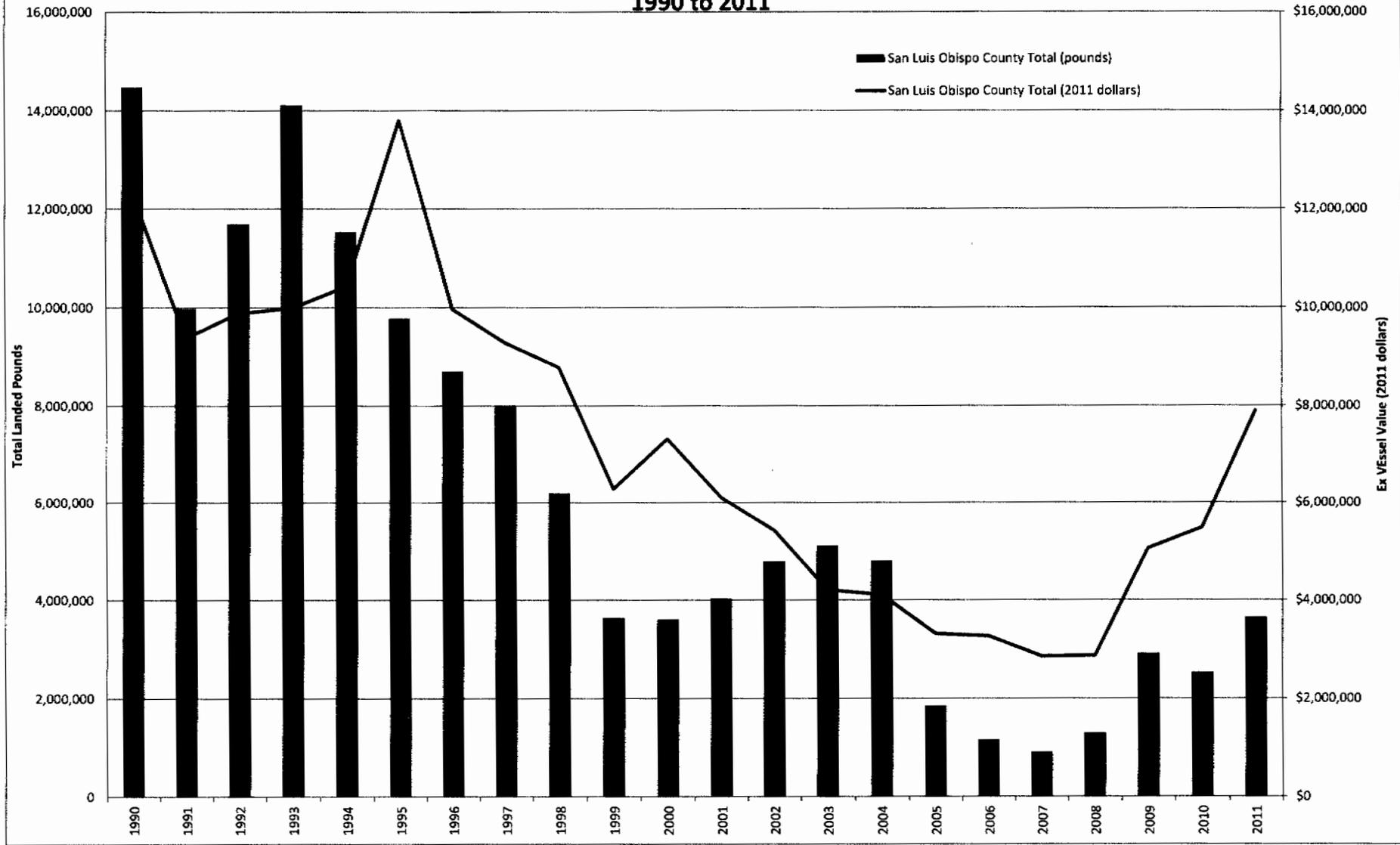
Please call me if you need additional information.

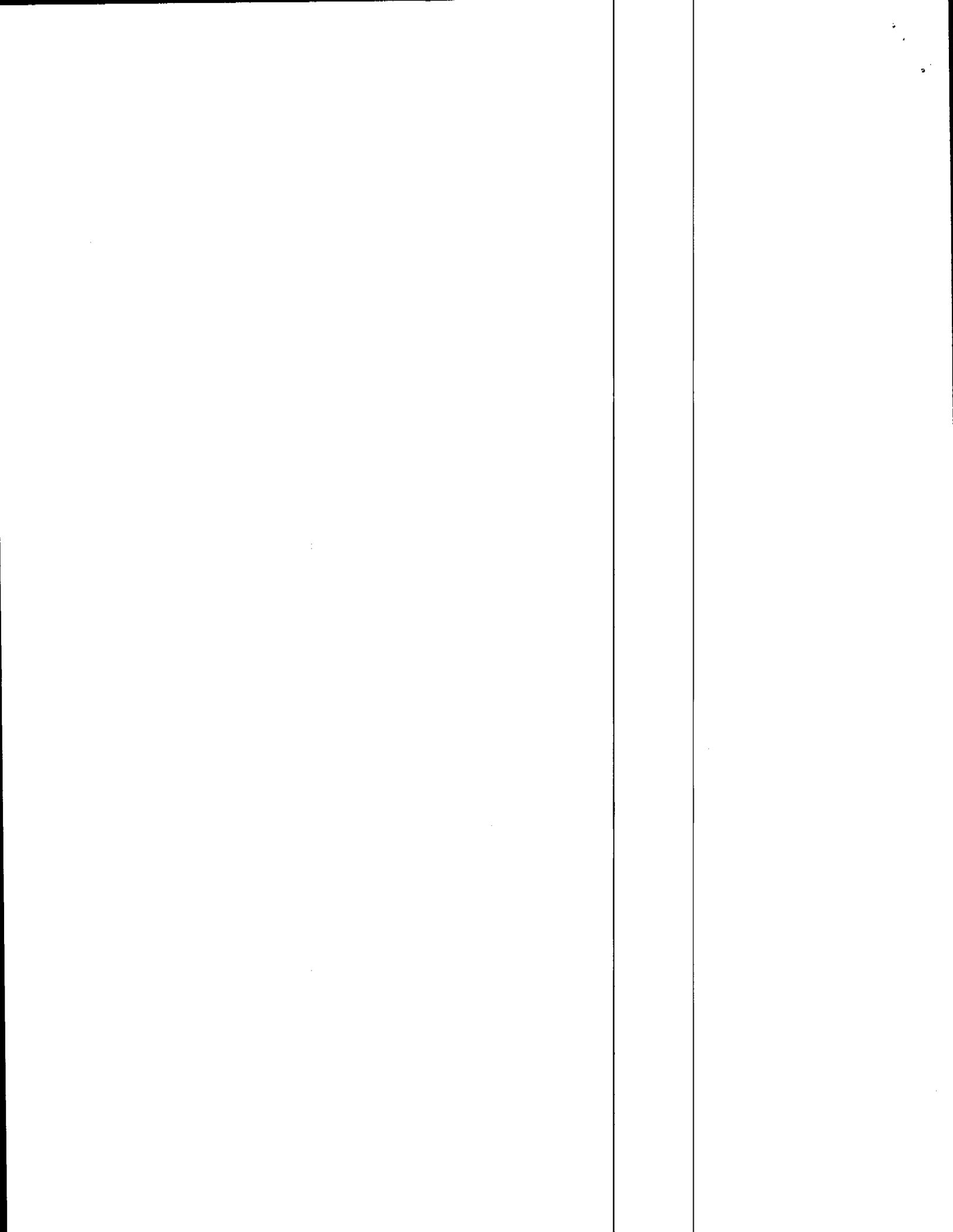
Sincerely;

Thomas Roff  
Morro Bay Commercial Fishermen's Organization  
Morro Bay, Ca  
805 459-9213

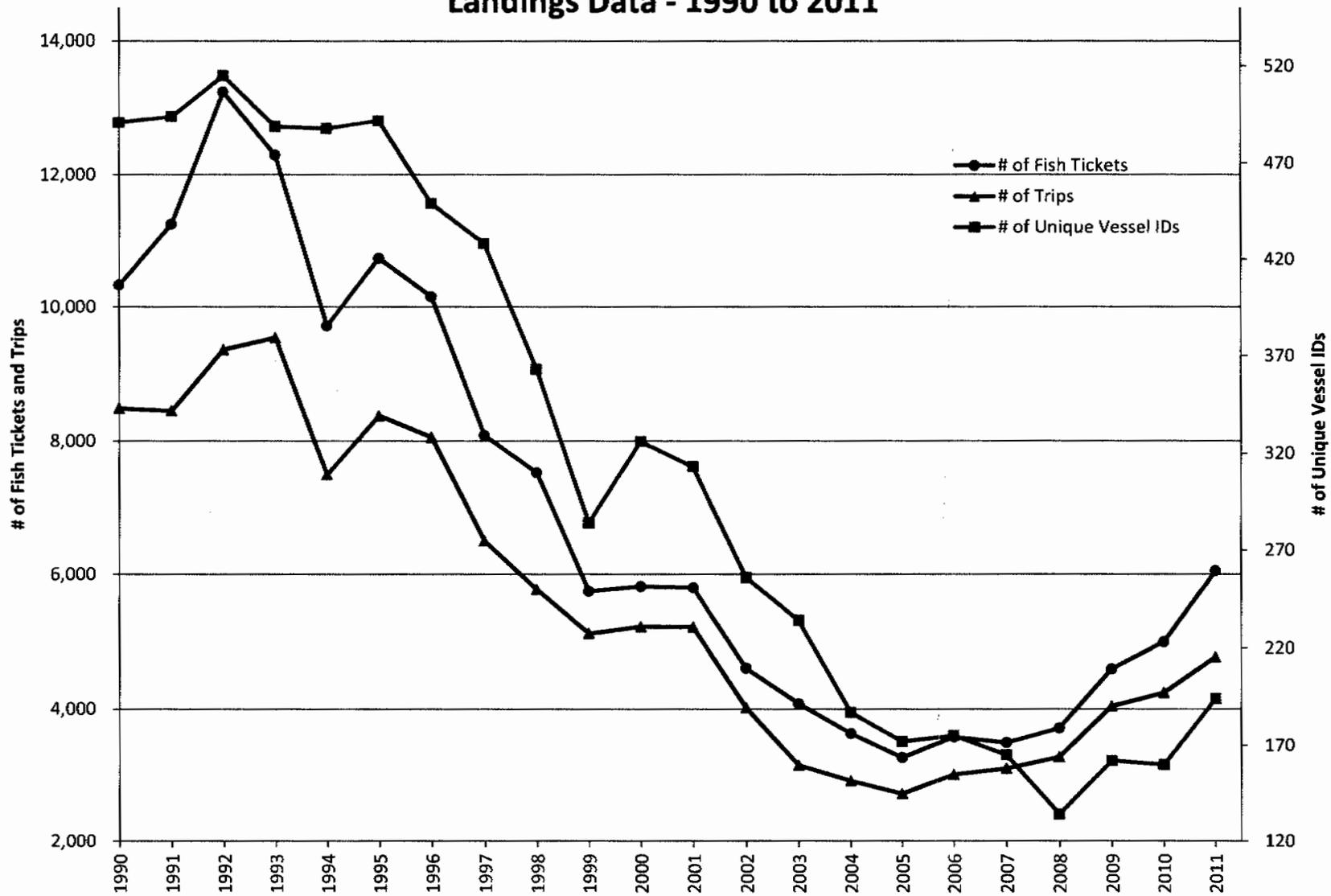


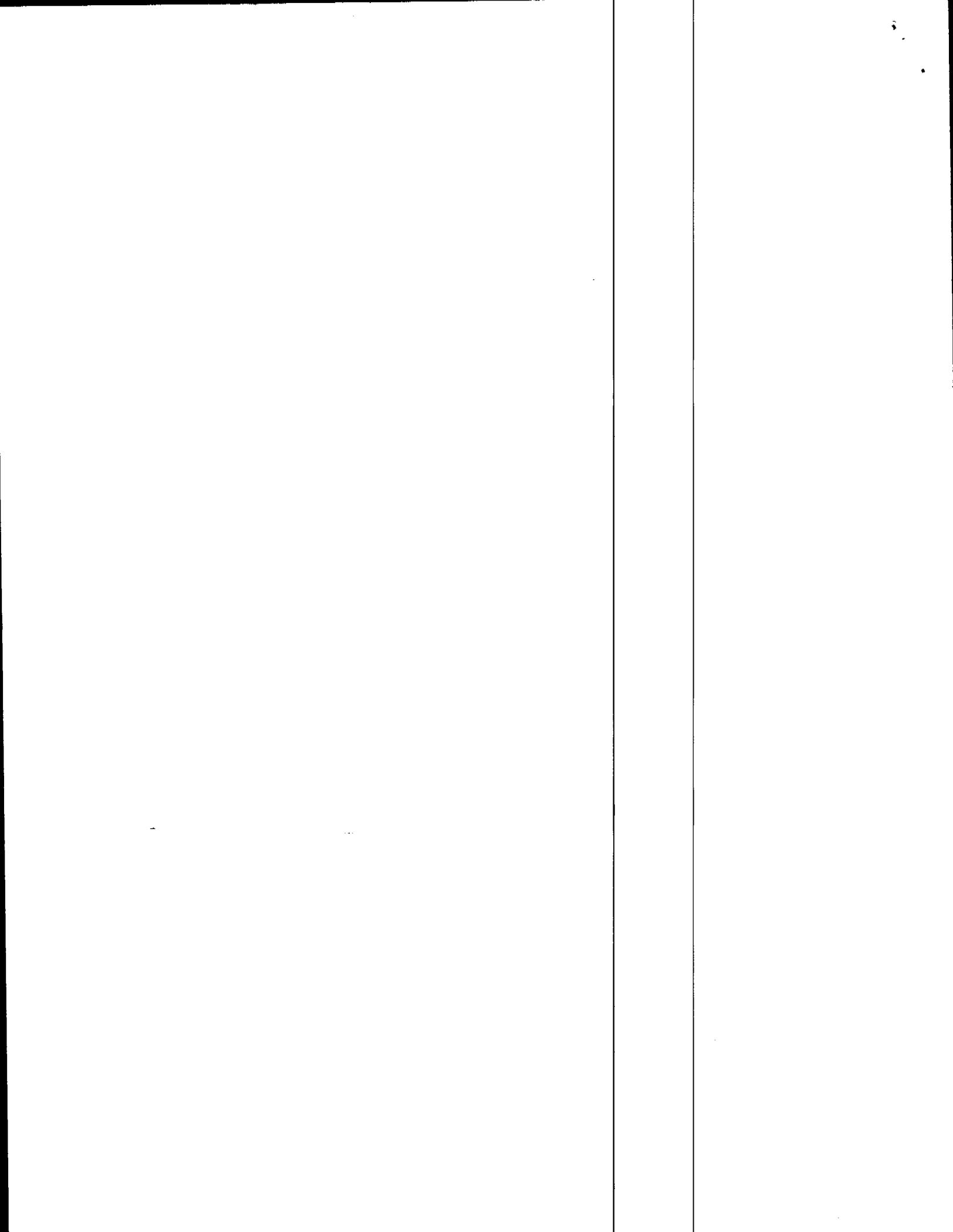
### San Luis Obispo County Total Landings (lbs) and Ex Vessel Value (\$) 1990 to 2011





## San Luis Obispo County Landings Data - 1990 to 2011







September 14, 2012

**RECEIVED**

SEP 17 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

RE: PG&E Diablo Seismic Survey

Dear Dan Carl, Deputy Director,

We ask you to deny or postpone issuing a geophysical survey permit to PG&E for high intensity seismic testing in San Luis Obispo County. If you allow the permit, then the only acceptable mitigation is the restoration of the marine damage.

We suggest mitigation of \$2.5 million per year for 20 years to provide funds for a basic marine sanctuary for the restoration of sustainable fishing. Rockfish need to be about 20 years old to reproduce.

This mitigation would save the City of Morro Bay and other coastal communities, as well as give back to the ocean. This mitigation is in addition to the settlement PG&E is offering the fishermen for lost catches due to seismic testing.

The EIR states that commercial fishing will end for an unknown length of time. The Morro Bay and San Luis Harbor fishermen have worked for decades to create sustainable locally "branded" fishing. They now stand to lose their livelihoods. The fish stocks and their web-of-life will need to be restored.



### **Include Dr. Hamilton's scope**

We ask for land seismic surveys and low level ocean seismic surveys to be evaluated, and Dr. Hamilton's scope to be included before rushing to destroy the precious marine life within these waters and financially impacting coastal communities.

As printed in the September, 2012

[http://www.slocoastjournal.com/docs/marine\\_sanctuary.html](http://www.slocoastjournal.com/docs/marine_sanctuary.html)

**In their June 4, 2012 letter (printed at end of letter), The Alliance for Nuclear Responsibility (A4NR) asked the CA State Lands Commission to require PG&E to specifically delineate the changes in its offshore and onshore study plans necessary to gather data to fully assess the "missed fault" recommendations of Dr. Douglas Hamilton, as graphically mapped in the DEIR comment submitted by geologist Erik Layman. (Central Coastal California Seismic Imaging Project)**

**Dr. Hamilton was part of PG&E's Diablo geosciences team from 1971 to 1988.**

**Rochelle Becker, Executive Director of A4NR states that the CA Public Utilities Commission (CPUC) Judge proposed decision in the Diablo seismic funding case stated that they expect PG&E to include Dr. Hamilton's scope and that is what ratepayers expect for their multimillion dollar expenditure.**

**Dr. Douglas Hamilton's point in his testimony before the CPUC, February 10, 2012: "...nothing in the planned additional surveys, both onshore and offshore, offers any prospect for any result beyond marginal improvement to what is already known."**

**Andrew Christie, Director of the Santa Lucia Sierra Club**



**states: "PG&E says they will incorporate the additional onshore areas he pointed out they had ignored in their initial survey design; they have not said they are deleting offshore areas he pointed out as already sufficiently studied, or sought his input on which areas those are, beyond the now-deleted Cambria Stepmover."**

### **Seismic Issues – Overview by Karl Kempton**

The land mass west of the San Andreas Fault, north from Tamales Bay and south to the tip of Baja, is on a tectonic trajectory to form an archipelago off North America. Rifting is occurring up the Sea of Cortez pushing Baja westward. Baja's pressure causes the Western Transverse Block to our immediate south to rotate. The rotation to the current moment has been over 90 degrees since the process began. This rotation places pressure on our land mass, that in part causes of the uplift of the Irish Hills and the deformation of the seabed off our coast. The cracks in the seabed, the Hosgri, Santa Lucia and other faults, are a result of these and other tectonic forces which are tremendous in nature. Only recently has this macro picture begun to be understood. Cataclysmic ruptures are in our near and distant future.

The Diablo Canyon Nuclear Power Plant would not be permitted on its present site today. It may not have been permitted had PG&E not covered up and down played an earth fault upon which they built the power plant.

**Carl Neiburger reported the 14-year cover-up by PG&E in the SLO Tribune on November 5, 1981 (printed at end of letter).**

**"PG&E found evidence of an earthquake fault within 500 feet of the Diablo Canyon Nuclear Power Plant in 1967, but chose not to pursue it to avoid 'additional speculation and possibly delay the project.'"**

The "fault" referenced in the article is the fault Dr. Hamilton

...with the ...  
...of the ...  
...the ...  
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...the ...  
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refers to today as the "Diablo Cove Fault." It had never been given a formal name until a couple of years ago when Dr. Hamilton submitted his first treatise (and draft) of his paper on this subject to the California Energy Commission.

We question that the Diablo Cove Fault is not included in the fault lines printed on the EIR map (printed at end of letter).

**Marine Life Issues**

**"Proposed Central Coast National Marine Sanctuary, 1990"**

In the early 1990's, the nearshore and offshore waters from Point Sal to Mill Creek were nominated twice in Congressional bills for Marine Sanctuary status due to the international and national significance of bio diversity and density. This ocean area is where the high intensity seismic testing is proposed to occur.

In the first decade of this century, The Channel Islands and Monterey Bay National Marine Sanctuaries studied the unprotected waters between Point Conception and Santa Rosa Creek. Both sanctuaries have published maps and plans as a result of those studies to expand to protect these waters. See studies:

- 1) **A Biogeographic Assessment of the Channel Islands National Marine Sanctuary, "A Review of Boundary Expansion Concepts for NOAA'S National Marine Sanctuary Program," November 2005**
  
- 2) **A Biogeographic Assessment off North/Central California: In Support of the National Marine Sanctuaries of Cordell Bank, Gulf of the Farallones and Monterey Bay, "Phase II Environmental Setting and Update to Marine Birds and Mammals," October 2007**



## **West Coast Only Persistent Upwelling --**

The oceanographic features of the Santa Lucia Bank, a cetaceous uplift block to within 400 meters of the surface north of Arguello Canyon, the five-fingered Arguello Canyon, running NE-SW to a depth of 3000 meters, the Channel Islands, the Southern California Bite, and a meeting place of various currents all contribute to the only persistent upwelling along the west coast located between Points Conception and Sal.

The September 2010 article of the SLO Coast Journal is printed at the end of this letter.

## **“Core Area One of the Proposed Marine Sanctuary Expansion - Santa Lucia Bank, Santa Lucia Escarpment, Arguello Canyon and the Persistent Upwelling between Point Conception and Point Sal”**

Because of the nutrient-richness of the upwelling waters the area contains a vast array of marine life: a benthic (deep water) community of world-wide significance, simultaneous gathering of 13 whale and porpoise species, and large numbers of birds and fish during the Autumn. The upwelling feeds the entire web of life along the eastern rim of the Pacific Basin including two National Marine Sanctuaries to its South (Channel Islands) and North (Monterey Bay).

The entrained nutrients of this upwelling are the foundational food for the phytoplankton that in turn forms the basis of the web of life for the area and two national marine sanctuaries to its north and south. The phytoplankton richness maintains the internationally and nationally significant bio density and diversity of an area that two marine sanctuaries have called for sanctuary designation through expansion in their research documents and proposals.



6

This area temporally hosts many seasonal migrating species including the endangered brown pelican and California Grey Whale. The former's pre-wintering rookery population is densest along the shoreline of San Luis Obispo County. Many brown pelicans are in this area in November. The latter population begins its southern bound migration from the Arctic in the late Autumn; its first migrants are known to appear in late October or early November.

Of special note: some commercial businesses use sound waves to kill algae in a cleaning process, and state: *The complex pattern of ultrasonic vibrations through the water causes the algae vacuole cell wall to resonate and break, much like a glass breaking from a high pitched sound. The broken vacuole wall eliminates its ability to grow and reproduce.*

<http://www.spartanwatertreatment.com/algae-control.html>

We question: what will constant bombardment to all forms of algae from single cell to complex kelp do to the food chain? What will it do to single cell plankton and animal life, all of which form the foundation for the area's and the national marine sanctuaries to the south and north?

We are concerned that the marine web-of-life is at risk of surviving. The high intensity seismic testing at 250 decibels is expected to "cleanse" the close-proximity project area of all life.

Death and harm from sound waves occur because sound is a pressure wave. This is why you can feel your body vibrate during loud, low sounds (such as those felt during a concert). Intense waves can rip ear, lung, and other vibrating tissues. They also cause internal bleeding.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud.

2. The second part of the document outlines the various methods used to collect and analyze data. It describes the use of statistical techniques to identify trends and anomalies in the data, and the importance of using reliable sources of information.

3. The third part of the document discusses the role of the auditor in the process. It explains how the auditor is responsible for verifying the accuracy of the records and for reporting any discrepancies to the appropriate authorities.

4. The fourth part of the document discusses the importance of maintaining the confidentiality of the data. It explains that the data collected is often sensitive and that it is essential to take appropriate measures to protect it from unauthorized access.

5. The fifth part of the document discusses the importance of maintaining the integrity of the data. It explains that the data must be accurate and that it is essential to take appropriate measures to prevent any tampering or manipulation of the data.

6. The sixth part of the document discusses the importance of maintaining the security of the data. It explains that the data must be protected from unauthorized access and that it is essential to use appropriate security measures to ensure its safety.

7. The seventh part of the document discusses the importance of maintaining the availability of the data. It explains that the data must be accessible to those who need it and that it is essential to take appropriate measures to ensure its availability.

8. The eighth part of the document discusses the importance of maintaining the accuracy of the data. It explains that the data must be correct and that it is essential to take appropriate measures to ensure its accuracy.

9. The ninth part of the document discusses the importance of maintaining the consistency of the data. It explains that the data must be consistent and that it is essential to take appropriate measures to ensure its consistency.

To understand the impact of the sonic blasts, look at the numbers as they add up:

1 blast every 15 seconds

4 blasts per minute

240 blasts per hour

5,760 blasts per day

40,320 blasts per week

172,800 blasts per 30-day month

\*Three maps illustrating the blasting are printed on the next pages.

**Sacrifice Seismic Zone for Diablo**

*"This sonic seismic testing offers up an inexcusable sacrifice zone for Diablo. The seismic potential danger is such that it should be shut down, not fed the sacrifice of untold marine life,"*

Karl Kempton, former energy planner for San Luis Obispo County and lead author of "Proposed Central Coast National Marine Sanctuary, 1990.

We urge you to carefully consider how much these coastal communities and marine lives need to continue their sacrifices for a few more years of operating an old nuclear power plant that is located on and near faults and is no longer essential to California's electric grid. Nuclear power is not sustainable and is too expensive.

1. The first part of the document discusses the importance of maintaining accurate records.

2. This section covers the various methods used to collect and analyze data.

3. The second part of the document focuses on the challenges faced by researchers in this field.

4. It also addresses the ethical considerations that must be taken into account.

5. The third part of the document provides a detailed overview of the current state of research.

6. This section also discusses the potential future directions of the field.

7. The fourth part of the document concludes with a summary of the key findings.

8. Finally, it offers some thoughts on the implications of these findings for practice.

9. The fifth part of the document discusses the role of technology in modern research.

10. It also explores the impact of social media on the dissemination of research.

11. The sixth part of the document provides a historical perspective on the field.

12. This section also highlights the contributions of key figures in the field.

13. The seventh part of the document discusses the importance of interdisciplinary collaboration.

14. It also explores the benefits of working with researchers from other disciplines.

15. The eighth part of the document provides a detailed look at the methodology used in the study.

16. This section also includes a discussion of the limitations of the study.

17. The ninth part of the document discusses the results of the study in detail.

18. It also includes a discussion of the statistical significance of the findings.

19. The tenth part of the document provides a conclusion and a list of references.

20. Finally, it includes a list of appendices and a glossary of terms.

21. The eleventh part of the document discusses the implications of the findings for policy.

22. It also offers some suggestions for further research.

23. The twelfth part of the document provides a detailed look at the data used in the study.

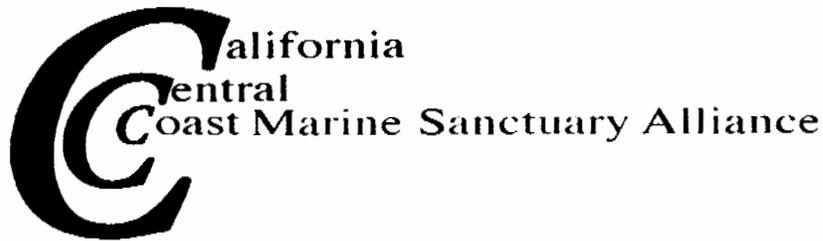
24. This section also includes a discussion of the reliability of the data.

25. The thirteenth part of the document discusses the role of funding in research.

26. It also explores the challenges of securing funding for research.

27. The fourteenth part of the document provides a final summary of the key findings.

28. Finally, it offers some thoughts on the future of the field.



September 13, 2012

Central Coast District Office  
Dan Carl, Deputy Director

Dear Dan Carl, Deputy Director,

RE: PG&E's Seismic Testing Survey

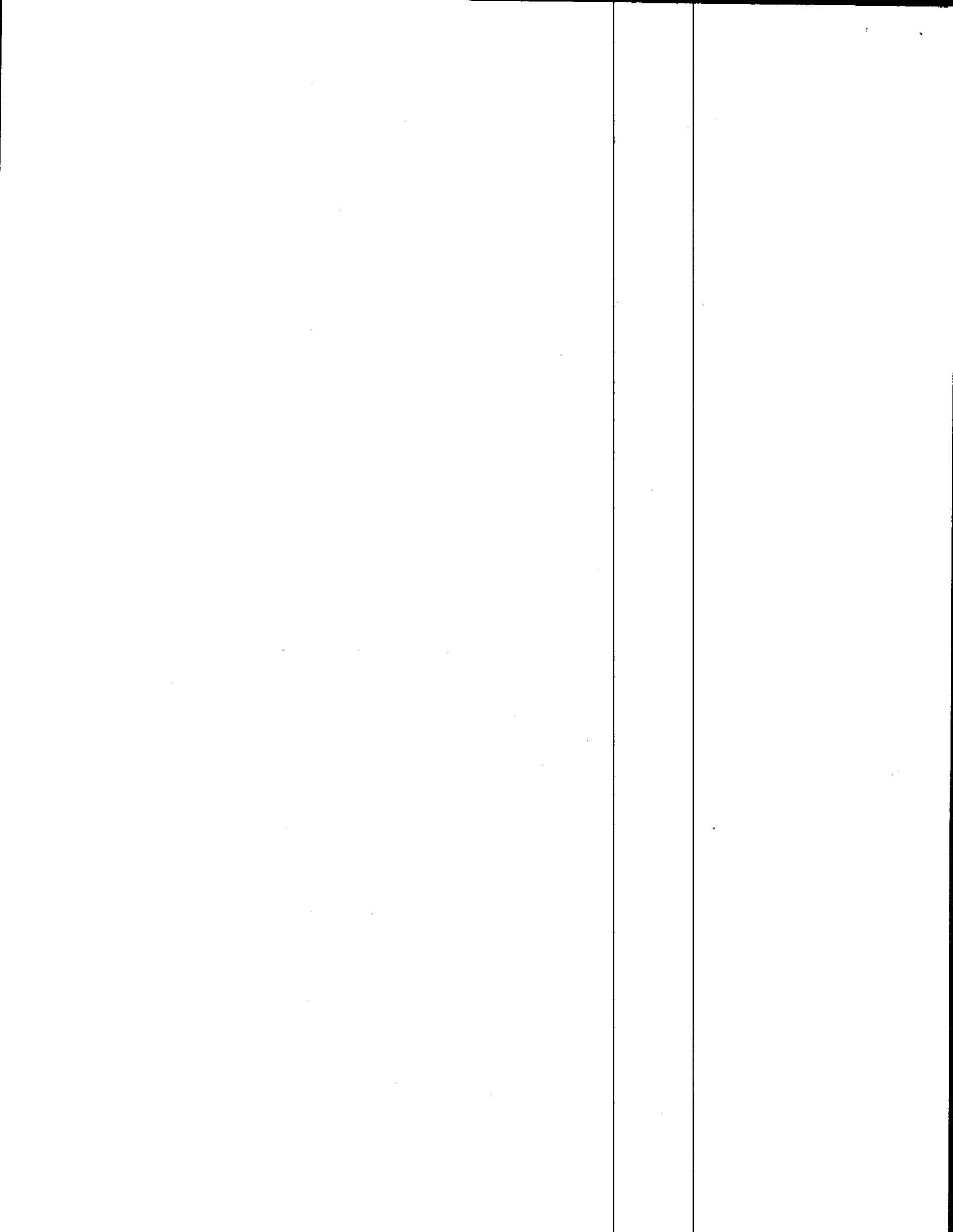
Our local fishing communities need your support with PG&E's seismic surveying.

Many in San Luis Obispo County are concerned about the low level seismic testing that is occurring in their coastal waters. Some are catching large fish in shallow water that should be in deeper water (54lb lingcod), and others are finding a number of dead thresher and salmon sharks washed ashore between Shell Beach and Cayucos. Fishermen are noticing differences in catch rates. The only environmental change is low level seismic testing.

We are concerned that PG&E has the proper permits to perform low level seismic testing.

We are concerned that we do not know what decibel level the low level seismic testing is using.

We are concerned that PG&E may be harming marine mammals and destroying fish stocks.



We are concerned that PG&E has not provided a way to pick up, remove, and study the dead marine life that washes ashore due to their seismic testing.

We are concerned that PG&E will continue with this irresponsible behavior when, and if, they receive a permit for high level seismic testing.

According to PG&E: Seismic Study Update 9/12/2012  
<http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/seismic>

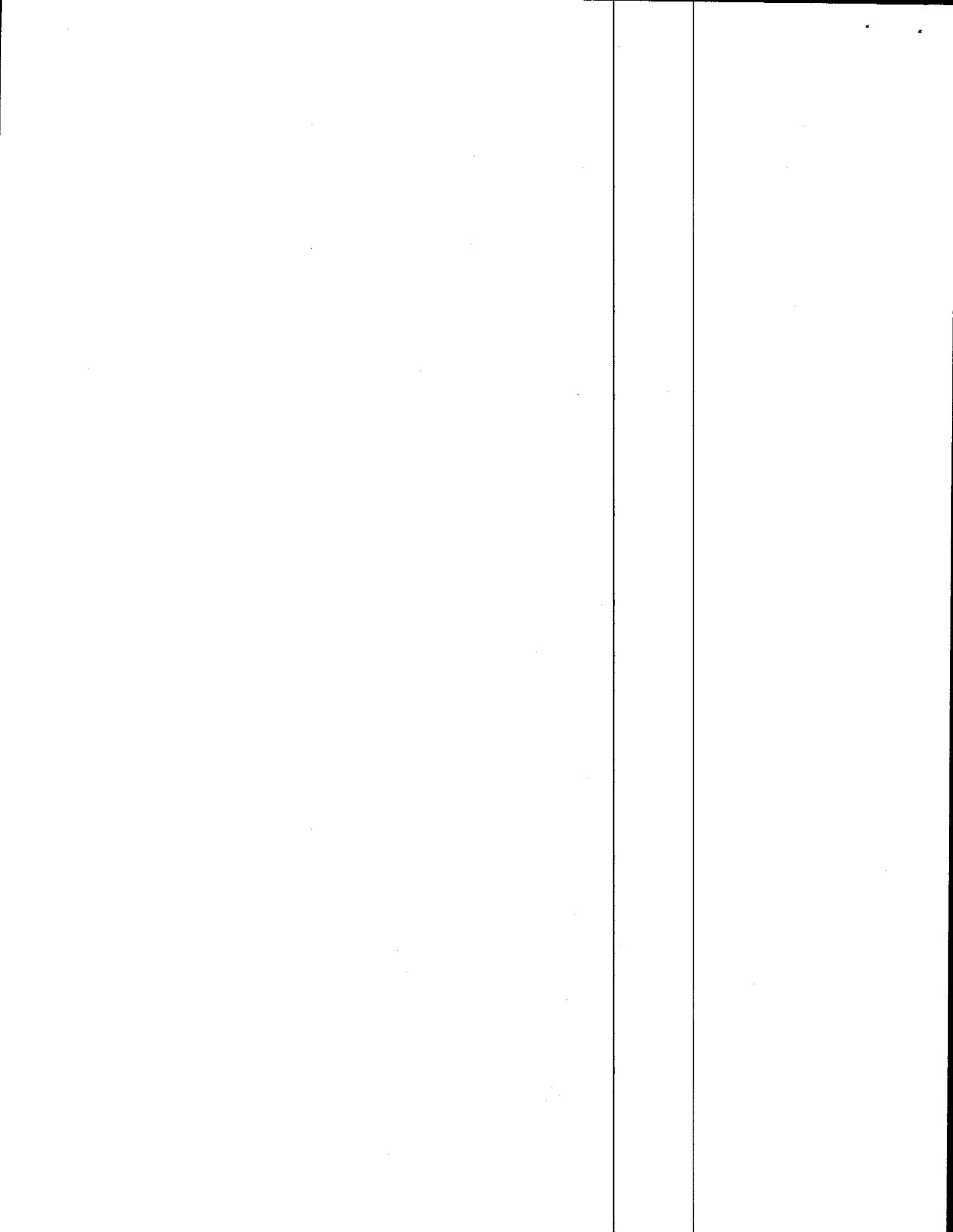
During the week of August 20, 2012, PG&E will resume low-energy seismic research work off portions of California's Central Coast.

PG&E began the first phase of this low-energy offshore study in 2010, and completed the second portion in 2011. The third phase will study areas near San Luis Bay, Estero Bay and Point Sal.

All operations will be performed during daylight hours and processes and procedures have been implemented to monitor and protect marine mammals while the study is underway.

Mariner and commercial boat traffic are encouraged to remain at least a mile away from the vessel while it operates in the area to avoid entanglement with research equipment. Daily updates on the location of the vessel can be found at [www.marinetraffic.com](http://www.marinetraffic.com) using the search word "Pacific Star."

Our local fishing communities need your support. We need to know you are requiring, monitoring, and restricting PG&E in their need to perform high intensity seismic tests. Their



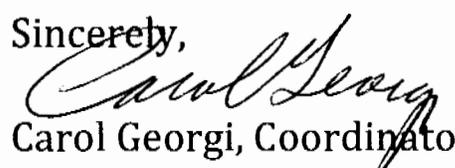
business and their jobs are no more important than the sustainable fishing communities in Port San Luis and in Morro Bay. Local Fishermen have worked for decades to establish local sustainable fishing with local branding.

We respectfully ask that you either deny or postpone the high level seismic tests until fall of 2013. Not rushing forward with these high intensity seismic tests will give the peer group and PG&E time to review and evaluate the land tests and the low level ocean tests. High intensity ocean seismic testing should only occur after these evaluations.

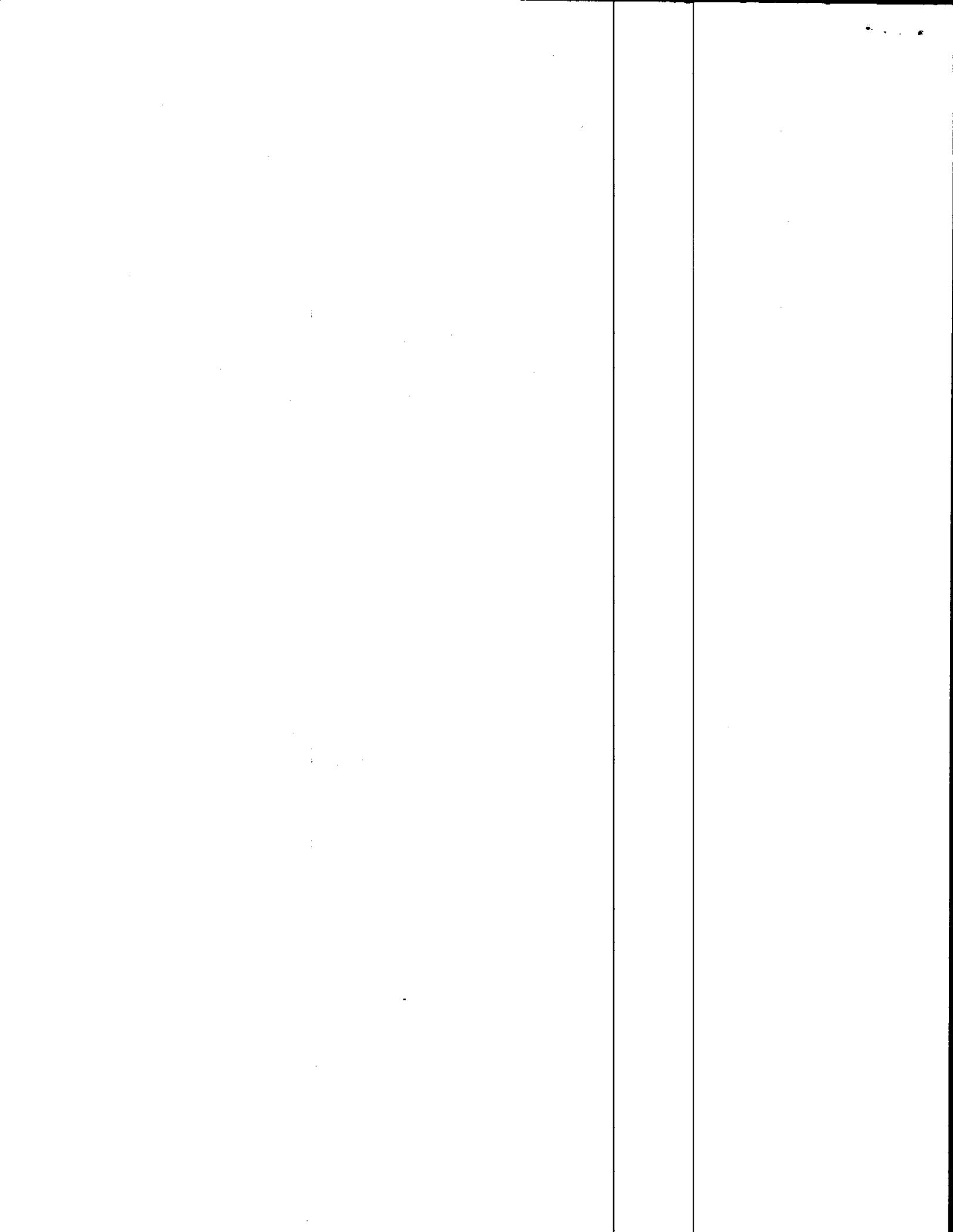
Our ocean life and marine food supply is too valuable to recklessly destroy. Please apply the Precautionary Principle as you make your decisions.

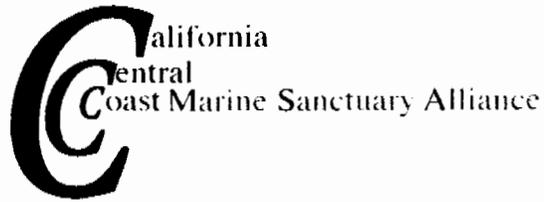
Thank you for addressing our concerns.

Sincerely,



Carol Georgi, Coordinator CA Central Coast Marine Sanctuary Alliance <http://themsa.org/themsa/Welcome.html>





September 13, 2012

Central Coast District Office  
Dan Carl, Deputy Director

Dear Dan Carl,

**RE: PG&E Seismic Survey**

I have attached an excellent research article, published August 2012  
"A Review of Impacts of Seismic Airgun Surveys on Marine Life"

This is an excellent review of scientific studies by Lindy Weilgart,  
PH.D.

<http://epic.awi.de/19711/> abstract for attached article

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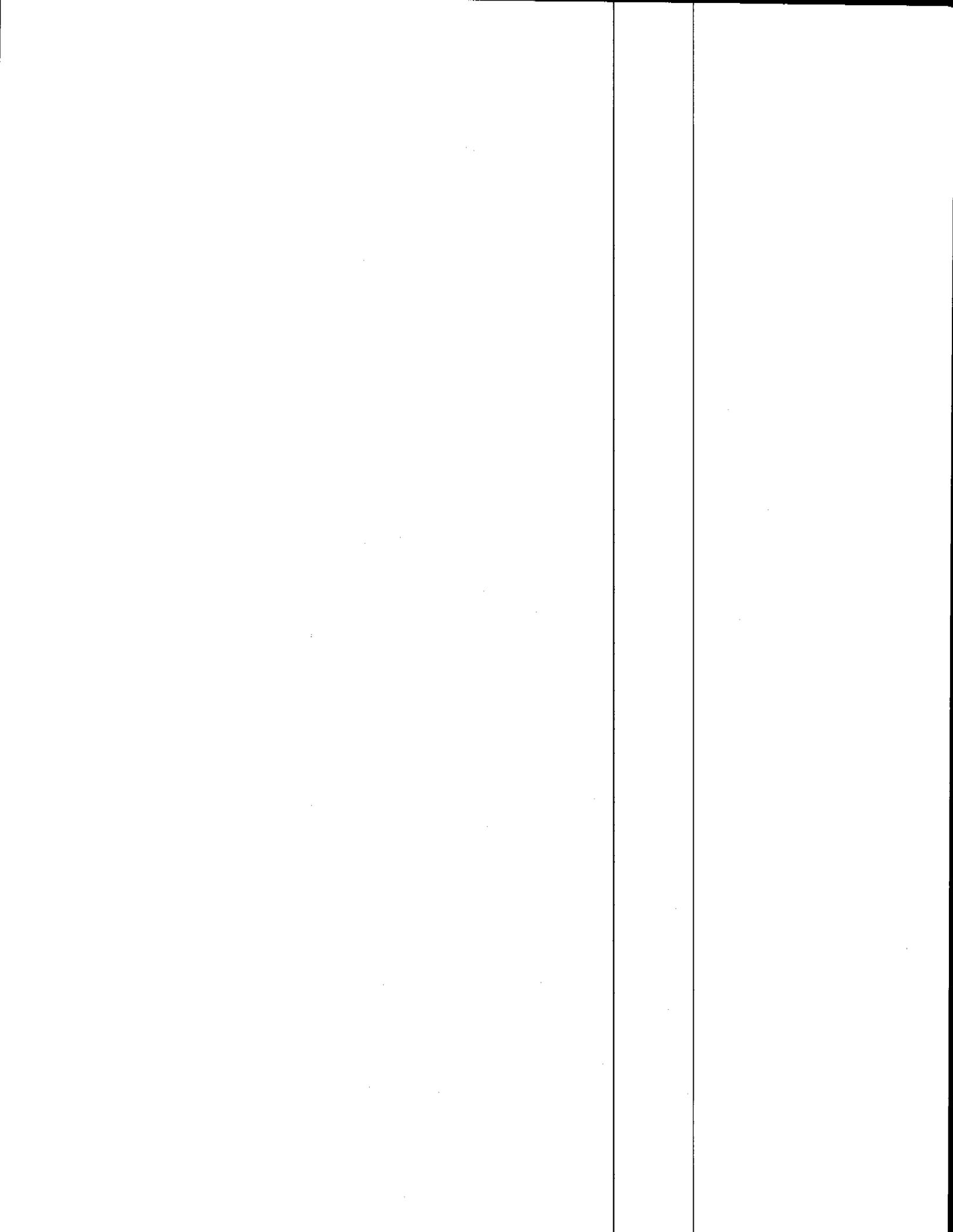
**Please do not permit the pending PG&E Seismic Survey in the ocean near Diablo Canyon Nuclear Power Plant.**

The location of the survey area sits between two National Marine Sanctuaries and has itself qualified for National Marine Sanctuary Designation since 1990.

The sonic blasts will be too intense at 250 decibels for marine life to remain viable. The entire marine web-of-life will be destroyed.

At least postpone permitting for one year while more research, comments and concerns can be collected and analyzed.

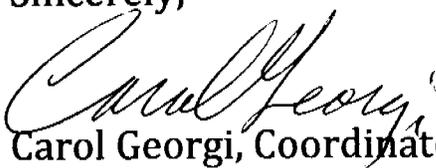
One-fourth of California's sea otters may die from the seismic testing, hypothermia or starvation from the destruction of their food source.



The Morro Bay and San Luis Harbor fishermen have worked for decades to create sustainable locally "branded" fishing. They now stand to lose their livelihoods. There is no mitigation for returning the fish and their web-of-life.

Therefore, rushing to permitting is not advisable for the communities and the marine life.

Sincerely,

  
Carol Georgi, Coordinator,

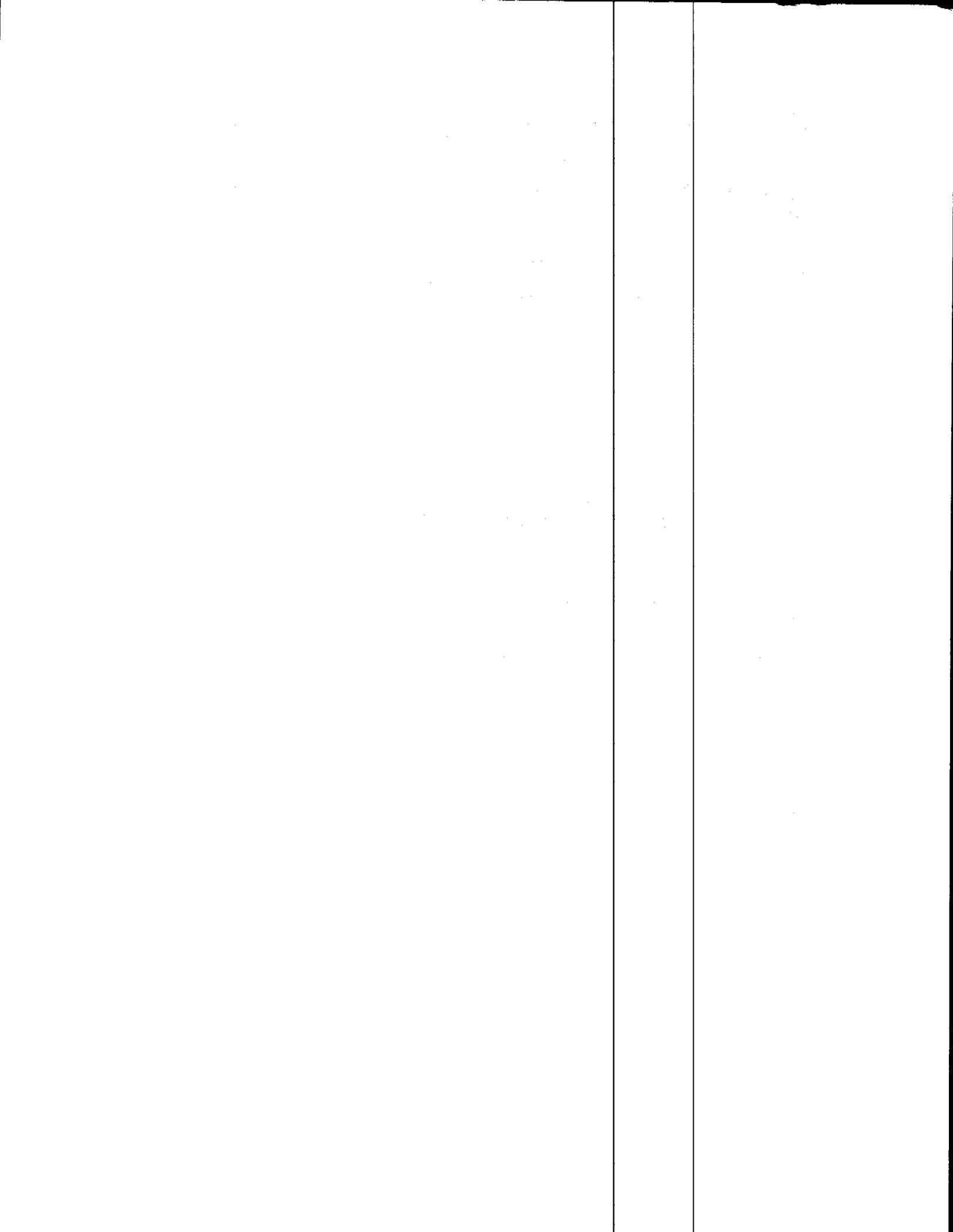
California Central Coast Marine Sanctuary Alliance

Email- [cdgeorgi@hotmail.com](mailto:cdgeorgi@hotmail.com)

Address: P.O. Box 13222

San Luis Obispo, CA 93406---3222

<http://themsa.org/themsa/Welcome.html>



## A Review of the Impacts of Seismic Airgun Surveys on Marine Life

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14 August 2012

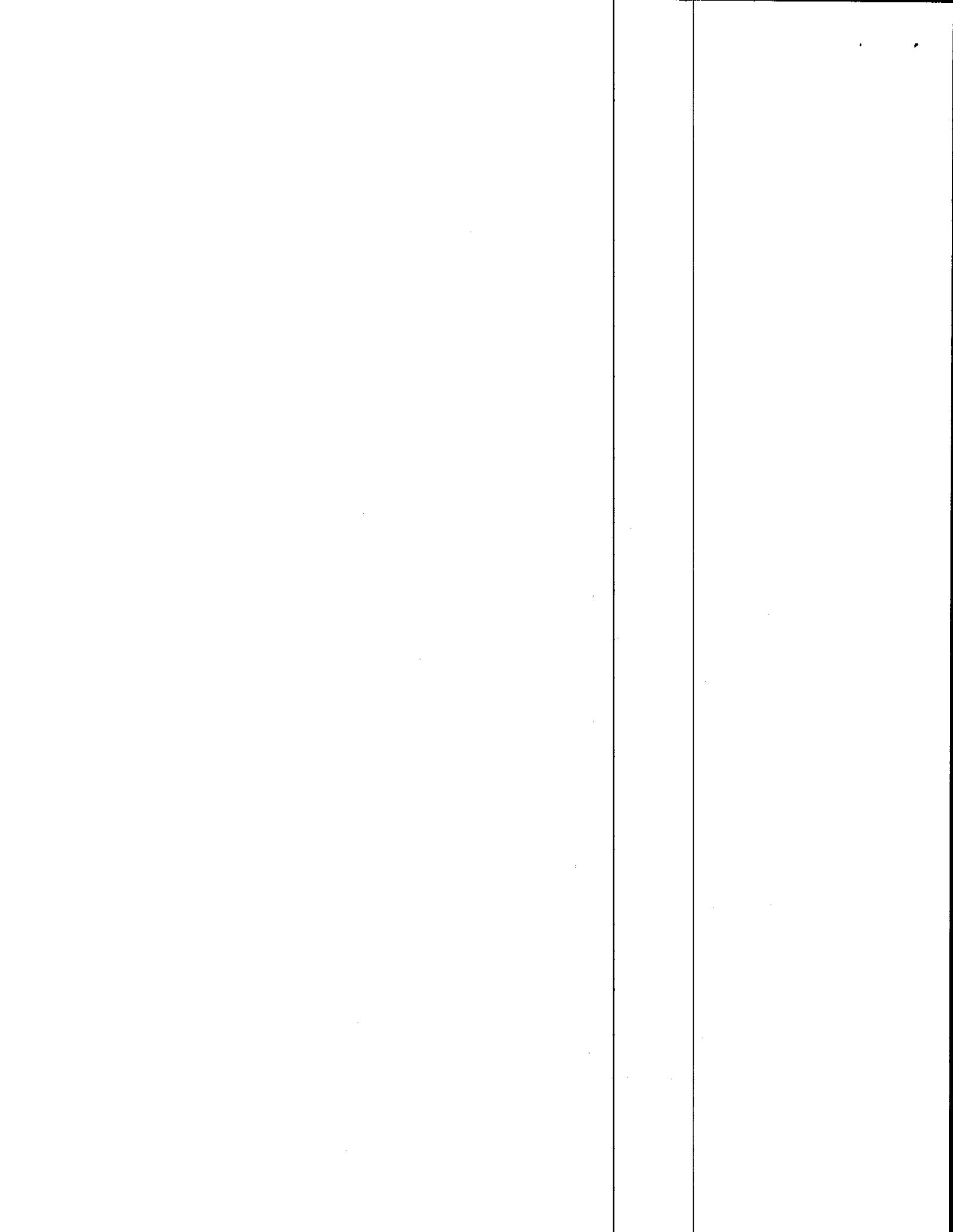
Noise from a single seismic airgun survey, used to discover oil and gas deposits hundreds of kilometers under the sea floor, can blanket an area of over  $300,000 \text{ km}^2$ , raising background noise levels 100-fold (20 dB), continuously for weeks or months (IWC 2005, IWC 2007). Since this exposes large portions of a cetacean population to chronic noise, the International Whaling Commission's Scientific Committee noted "...repeated and persistent acoustic insults [over] a large area...should be considered enough to cause population level impacts." (IWC 2005).

Nieukirk et al. (2012) analyzed 10 years of recordings from the Mid-Atlantic Ridge, finding that seismic airguns were heard at distances of 4,000 km from survey vessels and present 80-95% of the days/month for more than 12 consecutive months in some locations. When several surveys were recorded simultaneously, whale sounds were masked (drowned out), and the airgun noise became the dominant part of background noise levels.

To compare the total energy output per year (in joules) of the various human-made noise sources, the highest is  $2.1 \times 10^{15}$  J, representing the contribution from nuclear explosions and ship-shock trials (explosions used by the Navy to test the structural integrity of their ships). Immediately following in contribution are seismic airgun arrays at  $3.9 \times 10^{13}$  J. Next, are military sonars ( $2.6 \times 10^{13}$  J) and supertankers, merchant vessels, and fishing vessels at  $3.8 \times 10^{12}$  J (Hildebrand 2005).

### **Marine mammals**

Gordon et al. (2004) found that marine mammals can be impacted by the intense, broadband pulses produced by seismic airguns through hearing impairment (temporary or permanent threshold shift, TTS or PTS), physiological changes such as stress responses, indirectly by impacting their prey, behavioral alterations such as avoidance responses, displacement, or a change in vocalizations, or through masking (obliterating sounds of interest). Humpback and fin whales appear to communicate over distances of at least tens of kilometers (e.g. Watkins and Schevill 1979), so reducing this distance would compromise their ability to communicate.

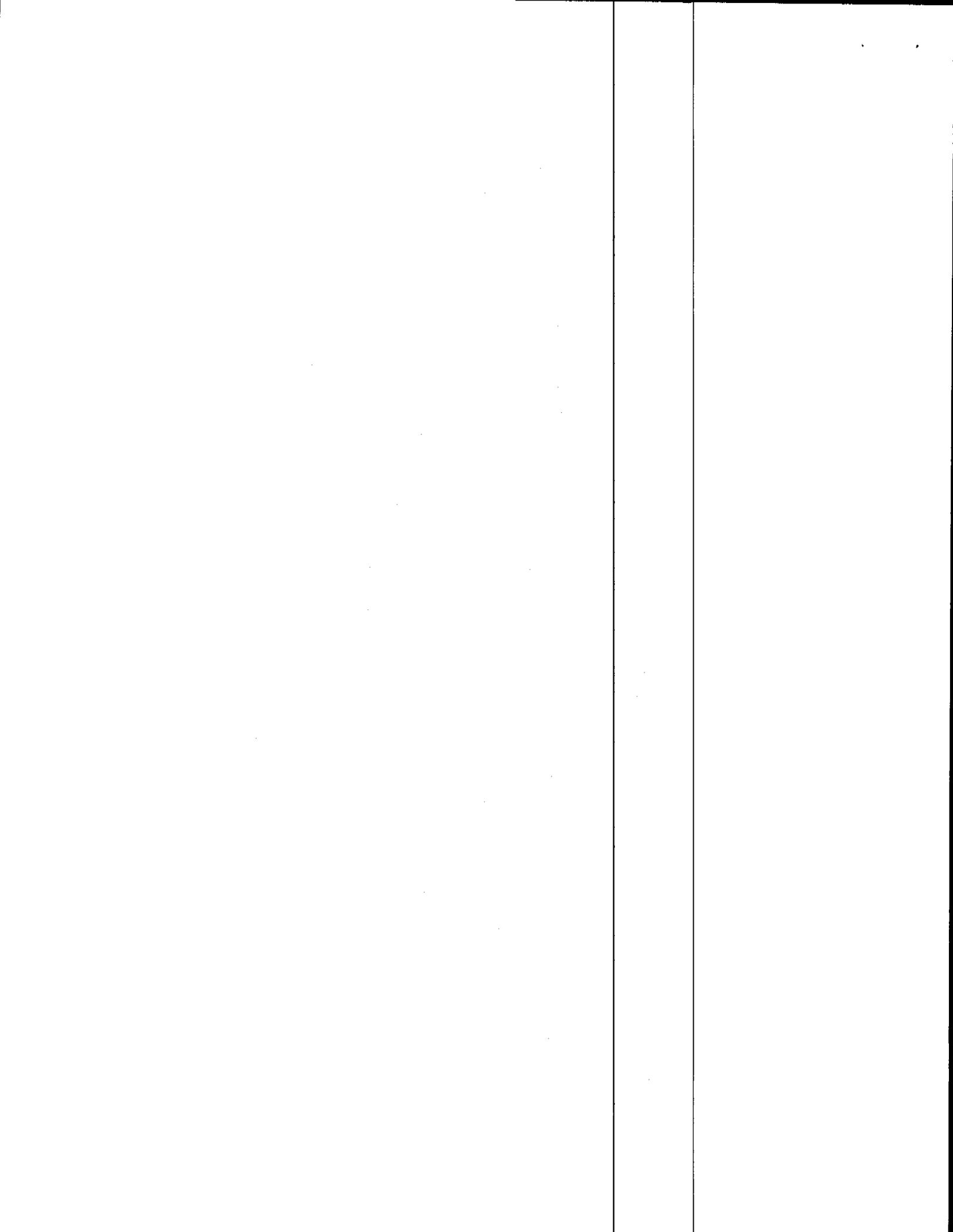


Around 250 male fin whales appeared to stop singing for several weeks to months during a seismic survey, resuming singing within hours or days after the survey ended (International Whaling Commission 2007). Assuming male fin whale songs have a reproductive function, such as attracting and finding mates (Croll et al. 2002), it would be difficult to believe that such an effect would not be biologically significant. McDonald et al. (1995) noted that a blue whale stopped calling in the presence of a seismic survey 10 km away.

A different blue whale population showed the opposite reaction. Even a seismic survey using a low-to-medium power sparker caused blue whales in the St. Lawrence Estuary to modify their vocalizations (Di Iorio and Clark 2010). Blue whales called consistently more on days when the seismic survey was operating than when not, and more during periods within those days in which the sparker was on vs. off. The number of blue whale calls increased within the 1-hr block after sparker onset. The authors postulated that the blue whales were attempting to compensate for the additional introduction of noise, and noted that whales probably received a fairly low level of noise (131 dB re 1 mPa (peak to peak) over 30–500 Hz, with a mean sound exposure level of 114 dB re  $1 \mu\text{Pa}^2 \text{ s}$ ). Thus, they suggested that even low source level seismic survey noise could interfere with important signals used in social interactions and feeding (Di Iorio and Clark 2010).

Marine mammals also avoid seismic noise by vacating the area. Castellote et al. (2012) showed extended displacement of fin whales by a seismic survey which lasted well beyond the survey length. Weir (2008) found that Atlantic spotted dolphins showed stronger responses to seismic airgun exposure than humpback or sperm whales. These dolphins were found significantly farther away from the airguns when they were on vs. off and only approached the seismic vessel when the airguns were silent. An analysis of cetacean responses to 201 seismic surveys in UK waters exhibited evidence of disturbance (Stone and Tasker 2006). During active seismic surveying, all small odontocetes, killer whales, and all mysticetes were found at greater distances from the seismic vessel than when it was not shooting. Small odontocetes showed the greatest horizontal avoidance, which reached to the limit of visual observation. Sighting rates for mysticetes, sperm whales, pilot whales, and killer whales did not decrease when airguns were off vs. on, but mysticetes and killer whales showed localized avoidance. During seismic shooting, fewer animals appeared to be feeding, smaller odontocetes seemed to swim faster, and mysticetes appeared to remain longer at the surface where sound levels are lower. Reactions were stronger to larger volume seismic arrays. Stone and Tasker (2006) theorized that smaller odontocetes may vacate the area entirely during exposure to seismic, whereas slower-moving mysticetes may remain in the area, simply increase their distance from the noise.

Responses can differ according to context, sex, age class, or species. Bowhead whales avoided seismic air-gun noise at received levels of 120–130 dB (rms over pulse duration) during their fall migration, though they were much more tolerant of noise when feeding in the summer, staying away from levels of 158–170 dB, which are roughly 10 000 times more intense (Richardson et al. 1995, 1999). Humpback cows and calves in key habitat evaded seismic air guns at 140–143 dB re  $1 \mu\text{Pa}$  mean squared pressure, which was lower than the reaction of migrating humpbacks at 157–164 dB re  $1 \mu\text{Pa}$  mean squared pressure



(McCauley et al. 2000). Species with similar hearing capabilities and audiograms showed markedly different responses to airgun noise off British Columbia, with harbor porpoises appearing to be the most sensitive, responding to seismic noise at distances of >70 km, at received levels of <145 dB re 1  $\mu$ Pa rms (Bain and Williams 2006; International Whaling Commission 2007).

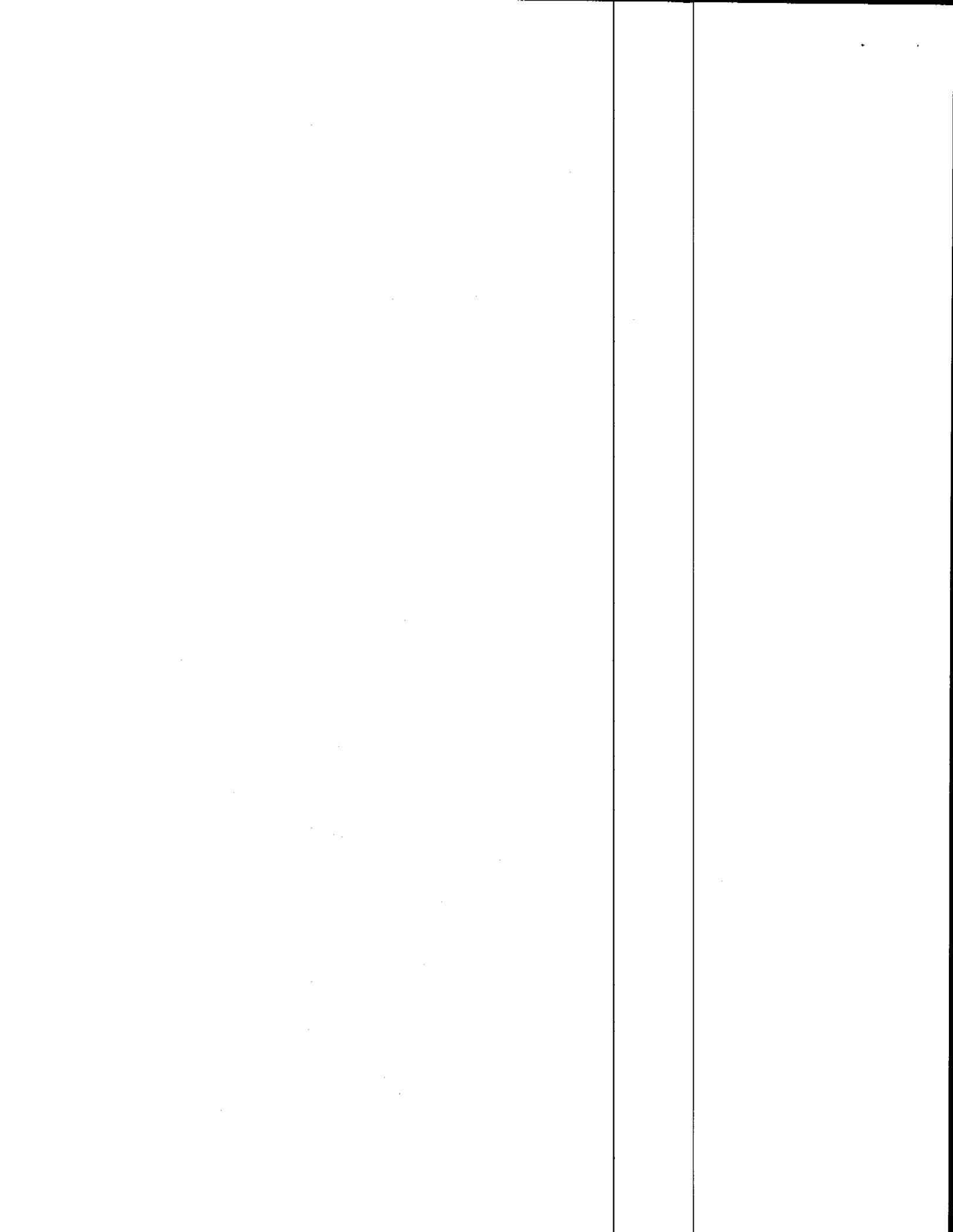
Reactions to seismic airguns can also be quite subtle and hard to detect. Sperm whales in the Gulf of Mexico did not appear to avoid a seismic airgun survey, though they significantly reduced their swimming effort during noise exposure along with a tendency toward reduced foraging (Miller et al 2009). Miller et al. (2009) tagged 8 sperm whales with tags recording sounds and movement while exposing them to operating airgun arrays. The longest resting bout ever observed in any sperm whale (265 min.) happened to the whale most closely approached by the actively firing seismic survey vessel, with the whale finally diving 4 min. after the final airgun pulse. Whales significantly reduced their fluke stroke effort by 6% during exposure to seismic noise compared with after, and all seven sperm whales studied reduced their fluke strokes on foraging dives in the presence of seismic noise. Moreover, there were indications that prey capture attempts were 19% lower during airgun noise exposure (Miller et al. 2009). The authors note that even small reductions in foraging rate could result in lower reproductive rates and have negative consequences for the population.

Though summering bowheads showed no detectable avoidance of seismic surveys, no change in general activities or call types, and no obvious alteration of calling rate, they dove for shorter periods and their respiration rate was lower than non-exposed bowheads (Richardson et al. 1986). Such changes were observed up to 54–73 km from seismic surveys at received levels that could be as low as <125 dB re 1  $\mu$ Pa (Richardson et al. 1995).

Seismic noise has been thought to at least contribute to some species' declines or lack of recovery (Weller et al. 2006a, 2006b; International Whaling Commission 2007). Critically endangered western gray whales off Sakhalin Island, Russia, were displaced by seismic surveys from their primary feeding area, returning only days after seismic activity stopped (International Whaling Commission 2005). This change in distribution closely followed the timing of the seismic surveys (International Whaling Commission 2005, 2007; Weller et al. 2006a). Whales exposed to seismic noise levels of about 153 dB re 1  $\mu$ Pa zero-to-peak and 159 dB peak-to-peak on their feeding grounds also swam faster and straighter over a larger area with faster respiration rates during seismic operations (Weller et al. 2006b; International Whaling Commission 2007).

Parente et al. (2007) discovered a reduction in cetacean species diversity with increasing numbers of seismic surveys during 2000 and 2001 off Brazil, despite no significant oceanographic changes in this period. Between 1999 and 2004, there was a negative relationship between cetacean diversity and the intensity of seismic surveys.

When exposed to a single airgun or small airgun array, gray seals showed avoidance and switched from foraging to transiting behavior. They also began hauling out, possibly to escape the noise. Harbor seals exhibited a slowing of their heart rate together with dramatic



avoidance behavior and stopped feeding (Thompson et al. 1998).

Seismic air guns are a probable cause of whale strandings and deaths as well, especially in beaked whales (Hildebrand 2005). A stranding of two individuals was tied very closely in space and time to a seismic survey in the Gulf of California. Even if impacts are fatal, only 2% of all cetacean carcasses are detected, on average (Williams et al. 2011). The authors state that for cryptic mortality events such as acoustic trauma, analytical methods are necessary to take into consideration the small percentage of carcasses that will be recovered.

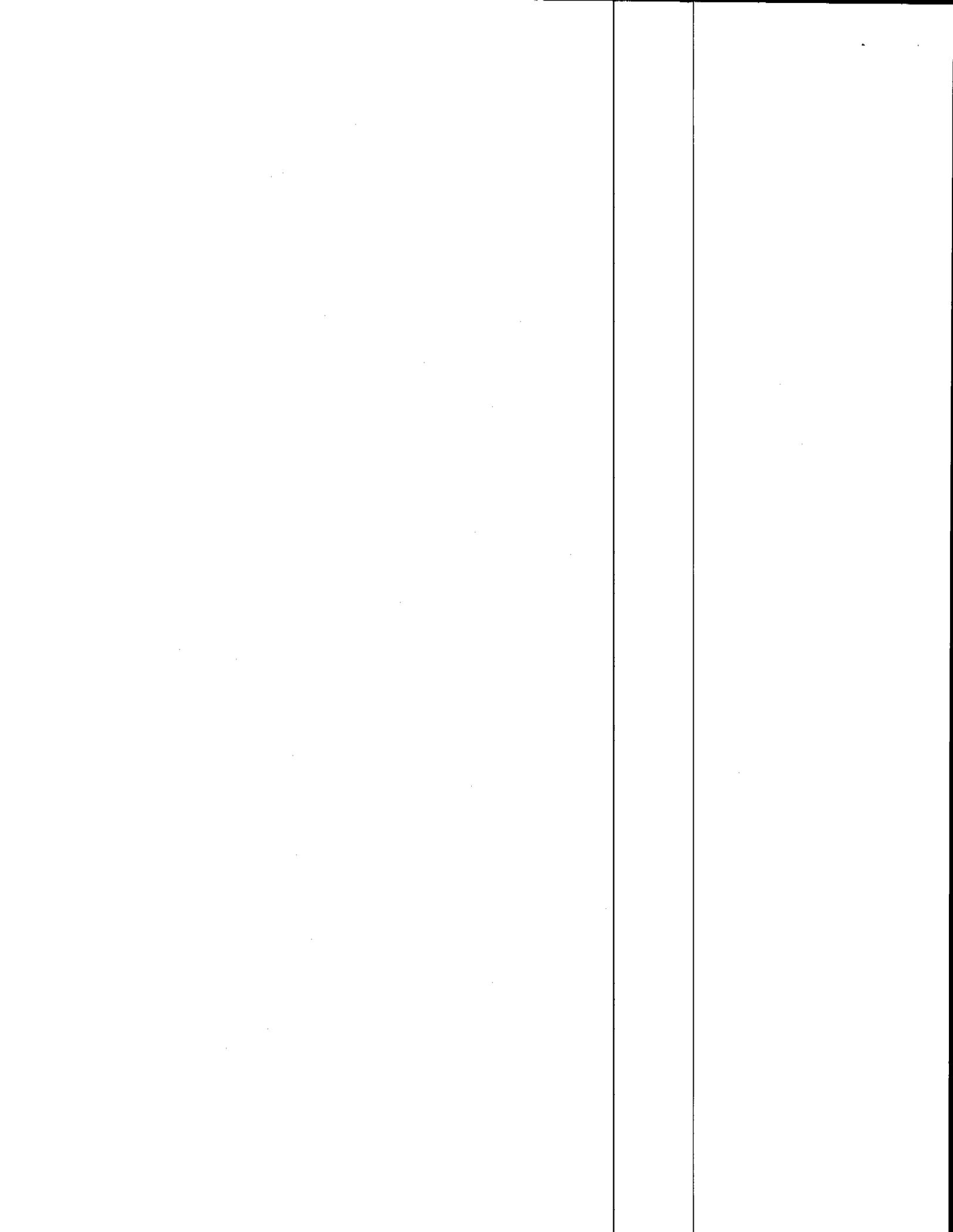
A pantropical spotted dolphin suffered rigidity and postural instability progressing to a catatonic-like state and probable drowning within 600 m of a 3D seismic survey firing at full power (Gray and Van Waerebeek 2011). The authors explained the initial aberrant behavior by a possible attempt by the dolphin to shield its sensitive rostrum and hearing structures from the intense acoustic energy of the airguns, by lifting its head above the water's surface. They believed the seismic survey could have caused this observed behavior, presumably resulting from severe acoustic distress and even injury.

Other explanations were examined and considered less likely (Gray and Van Waerebeek 2011).

Stress effects or physiological changes, if chronic, can inhibit the immune system or otherwise compromise the health of animals. These can be very difficult to detect in cetaceans. Indications of increased stress and a weakened immune system following seismic noise broadcasts were shown for a whale and dolphin (Romano et al. 2004). Loud, impulsive noise produced from a seismic water gun caused significantly increased mean norepinephrine, epinephrine, and dopamine levels immediately after a high, but not low-level exposure in a captive beluga whale (Romano et al. 2004). All three of these stress hormones increased significantly with increasing noise levels. These hormone levels remained high even 1 hour after noise exposure, which is surprising given their short half-life, according to the authors. In a captive bottlenose dolphin, the seismic water gun produced significant neuro-immune values, namely increases in aldosterone and a decrease in monocytes. Aldosterone is one of the principal stress hormones in cetaceans and may surpass cortisol as a more sensitive indicator of stress (Romano et al. 2004).

Mitigation measures to safeguard whales against high noise exposures are very inadequate. Generally, only the area within 500 m of the seismic vessel is observed, yet high noise levels can occur at much greater distances. Madsen et al. (2006) discovered that in the Gulf of Mexico received levels can be as high at a distance of 12 km from a seismic survey as they are at 2 km (in both cases >160 dB peak-to-peak). Received levels, as determined from acoustic tags on sperm whales, generally fell at distances of 1.4 to 6–8 km from the seismic survey, only to increase again at greater distances (Madsen et al. 2006).

Moreover, determining an exposure level that is "safe" for marine mammals is fraught with difficulty. For instance, a harbor porpoise exposed to airgun pulses was found to have lower (more sensitive) masked TTS levels than any other cetacean that has been tested, namely 164.3 dB re 1  $\mu\text{Pa}^2\cdot\text{s}$  SEL or 199.7 dB pk-pk re 1  $\mu\text{Pa}$  (Lucke et al. 2009). The noise level required to cause hearing loss (temporary threshold shift or TTS) in whales is still very uncertain, especially for seismic airguns, as there are so few empirical measurements. Between-individual variability, the population's average sensitivity (how



representative of the population was the tested animal), and the validity of extrapolating between species, particularly between captive small dolphins or porpoises (on which the few tests have been done) to free-ranging large baleen whales are all unknown. Gedamke et al. (2011) model how various factors and assumptions can change the percentage of whales exposed to damaging levels. When factoring in uncertainty and sources of variability, 29% (10-62%) of whales within 1-1.2 km of a seismic survey would experience levels sufficient to produce TTS onset. Without considering these factors, no whales beyond 0.6 km would be at risk for TTS, showing how even fairly small degrees of uncertainty can have a large effect on risk assessment (Gedamke et al. 2011). If management decisions are to be based on so little data, uncertainty must be taken into consideration. At close ranges, avoidance by whales of the seismic survey actually increased their exposure slightly as their speed was slower than the seismic vessel. Overall, Gedamke et al. (2011) concluded that TTS in baleen whales is plausible at ranges up to several kilometers.

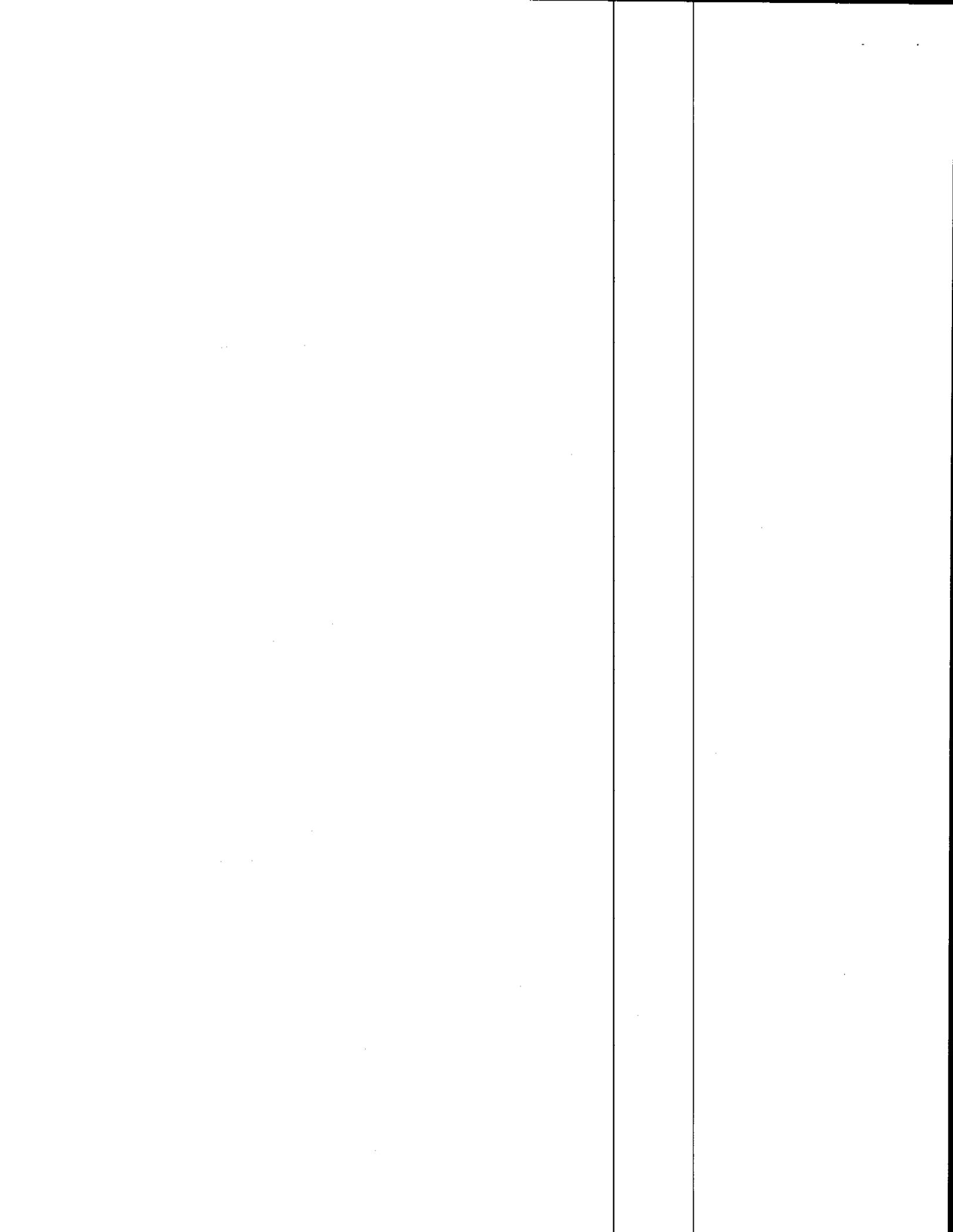
Many (36-57%) of the stranded or entangled dolphins or toothed whales have been shown to have profound hearing loss, implying that impaired hearing could have led to their stranding/entanglement (Mann et al. 2010).

### **Marine Turtles**

Marine turtles show a strong initial avoidance response to air-gun arrays at a strength of 175 dB re 1  $\mu$ Pa rms or greater (O'Hara and Wilcox 1990; McCauley et al. 2000; Lenhardt 2002). Enclosed turtles also responded progressively less to successive airgun shots which may indicate reduced hearing sensitivity (TTS). One turtle experienced a TTS of 15dB, recovering two weeks later (Lenhardt 2002). McCauley et al. (2000) estimated that a typical airgun array operating in 100–120 m water depth could impact behavior at a distance of about 2 km and cause avoidance at around 1 km for marine turtles. DeRuiter and Doukara (2010) found that 51% of turtles dived at or before their closest point of approach to an airgun array.

### **Fish**

A wide range of acoustic impacts on fish has been observed. Seismic air guns extensively damaged fish ears at distances of 500 m to several kilometres from seismic surveys. No recovery was apparent 58 days after exposure (McCauley et al. 2003). Behavioral reactions of fish to anthropogenic noise include dropping to deeper depths, milling in compact schools, "freezing", or becoming more active (Dalen and Knutsen 1987; Pearson et al. 1992; Skalski et al. 1992; Santulli et al. 1999; McCauley et al. 2000; Slotte et al. 2004). Reduced catch rates of 40%–80% and decreased abundance have been reported near seismic surveys in species such as Atlantic cod, haddock, rockfish, herring, sand eel, and blue whiting (Dalen and Knutsen 1987; Løkkeborg 1991; Skalski et al. 1992; Engås et al. 1996; Hassel et al. 2004; Slotte et al. 2004). These effects can last up to 5 days after exposure and at distances of more than 30 km from a seismic survey. The impacts of seismic airgun noise on eggs and larvae of marine fish included decreased egg viability, increased embryonic mortality, or decreased larval growth when exposed to sound levels of 120 dB re 1  $\mu$ Pa (Kostyuchenko 1973; Booman et al. 1996). Turbot larvae showed damage



to brain cells and neuromasts (Booman et al. 1996). Neuromasts are thought to play an important role in escape reactions for many fish larvae, and thus their ability to avoid predators. Increases in stress hormones have been observed in fish due to noise (Santulli et al. 1999).

## **Invertebrates**

Invertebrates also do not appear to be immune from the effects of anthropogenic noise.

Nine giant

squid mass stranded, some of them live, together with geophysical surveys using air guns in 2001 and 2003 in Spain (Guerra et al. 2004). The squid all had massive internal injuries, some severe, with internal organs and ears badly damaged. Another species of squid exposed to airgun noise showed an alarm response at 156-161 dB rms and a strong startle response involving ink ejection and rapid swimming at 174 dB re 1 $\mu$ Pa rms (McCauley et al. 2000). Caged squid also tried to avoid the noise by moving to the acoustic shadow of the cage. McCauley et al. (2000) suggest that the behavioral threshold for squid is 161-166 dB rms. A bivalve, *Paphia aurea*, showed acoustic stress as evidenced by hydrocortisone, glucose, and lactate levels when subjected to seismic noise (Moriyasu et al. 2004). Catch rates also declined with seismic noise exposure in *Bolinus brandaris*, a gastropod, the purple dye murex (Moriyasu et al. 2004). In snow crab, bruised ovaries and injuries to the equilibrium receptor system or statocysts were also observed (Department of Fisheries and Oceans 2004). Seismic noise-exposed crabs showed sediments in their gills and statocysts, and changes consistent with a stress response compared with control animals.

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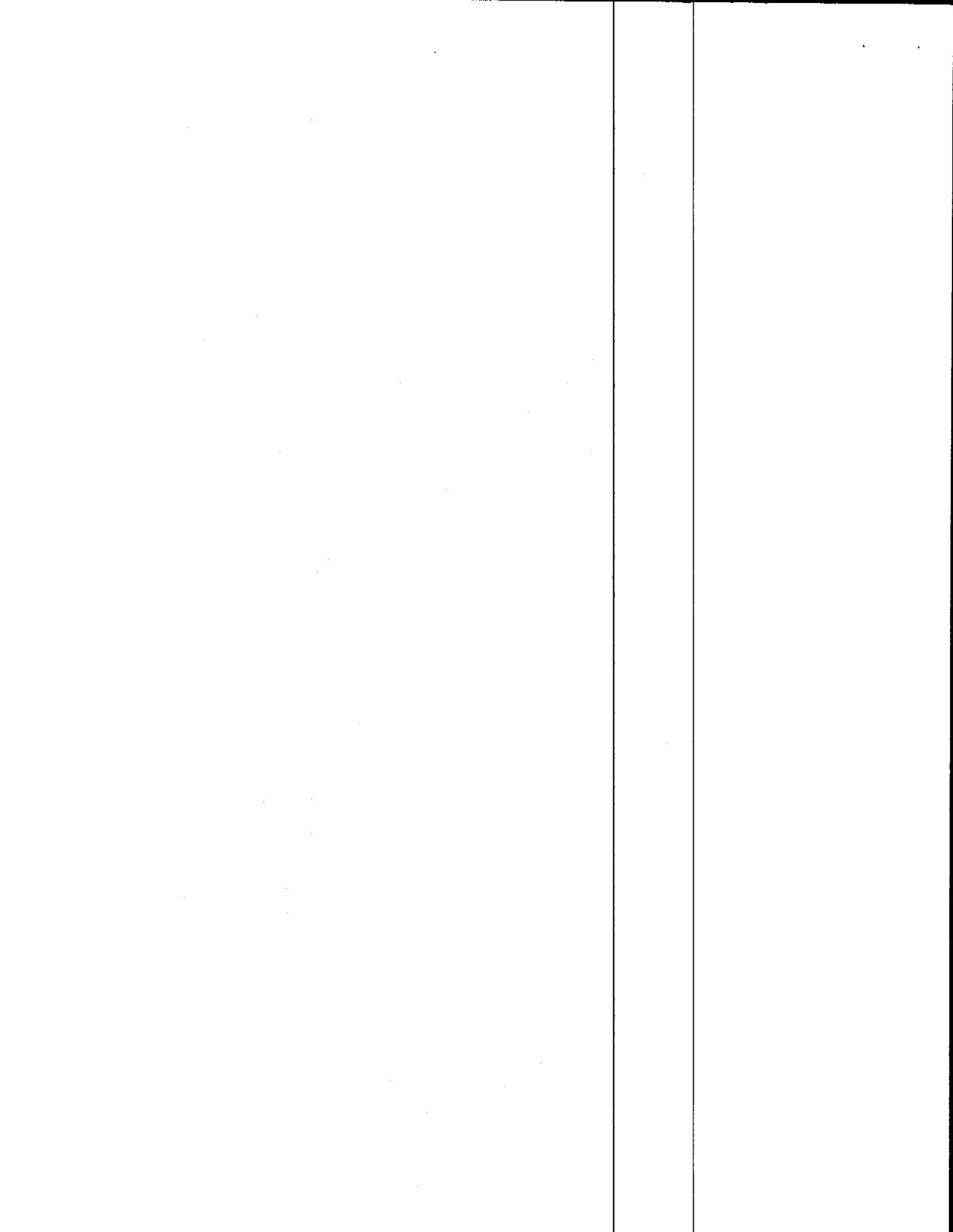
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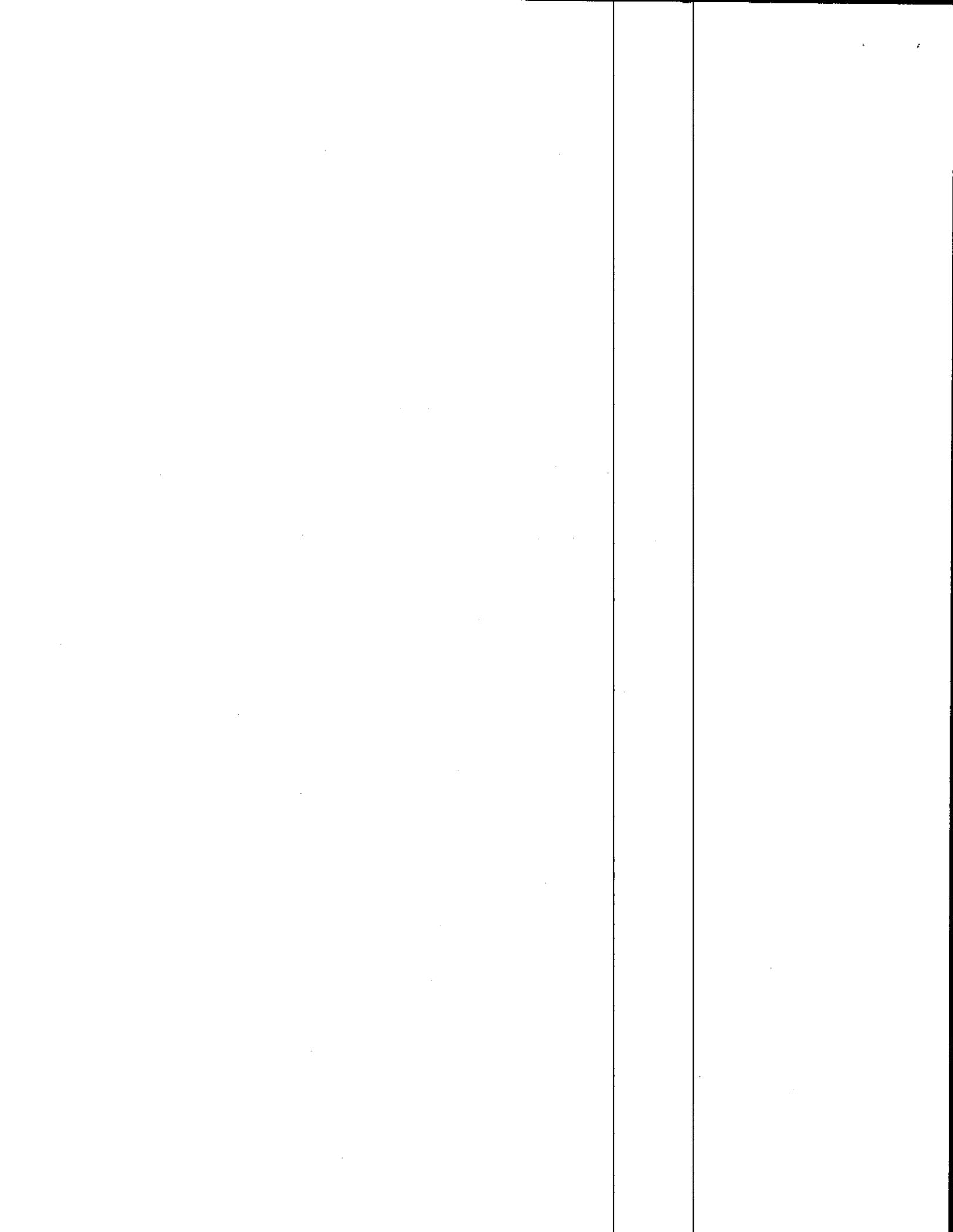
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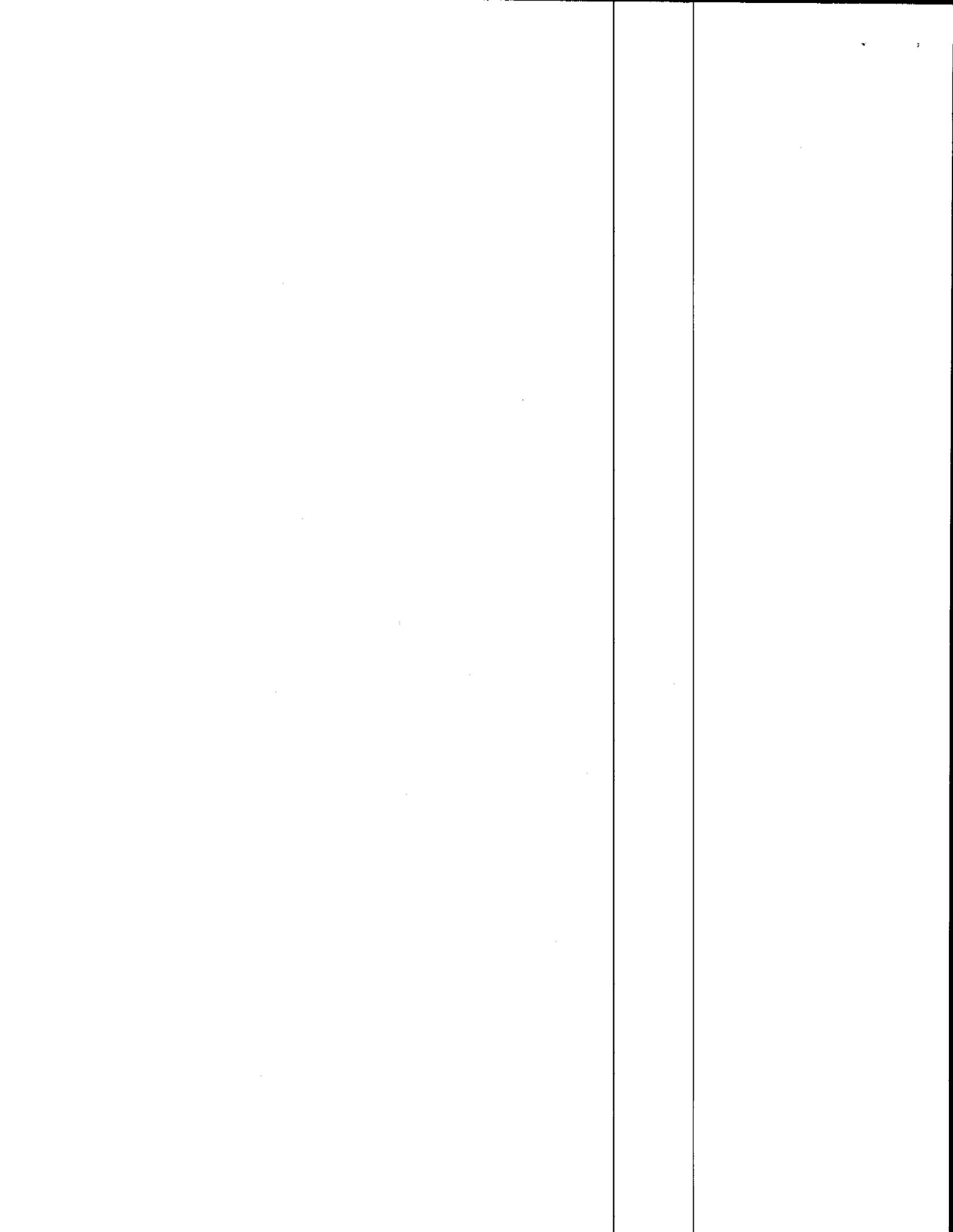
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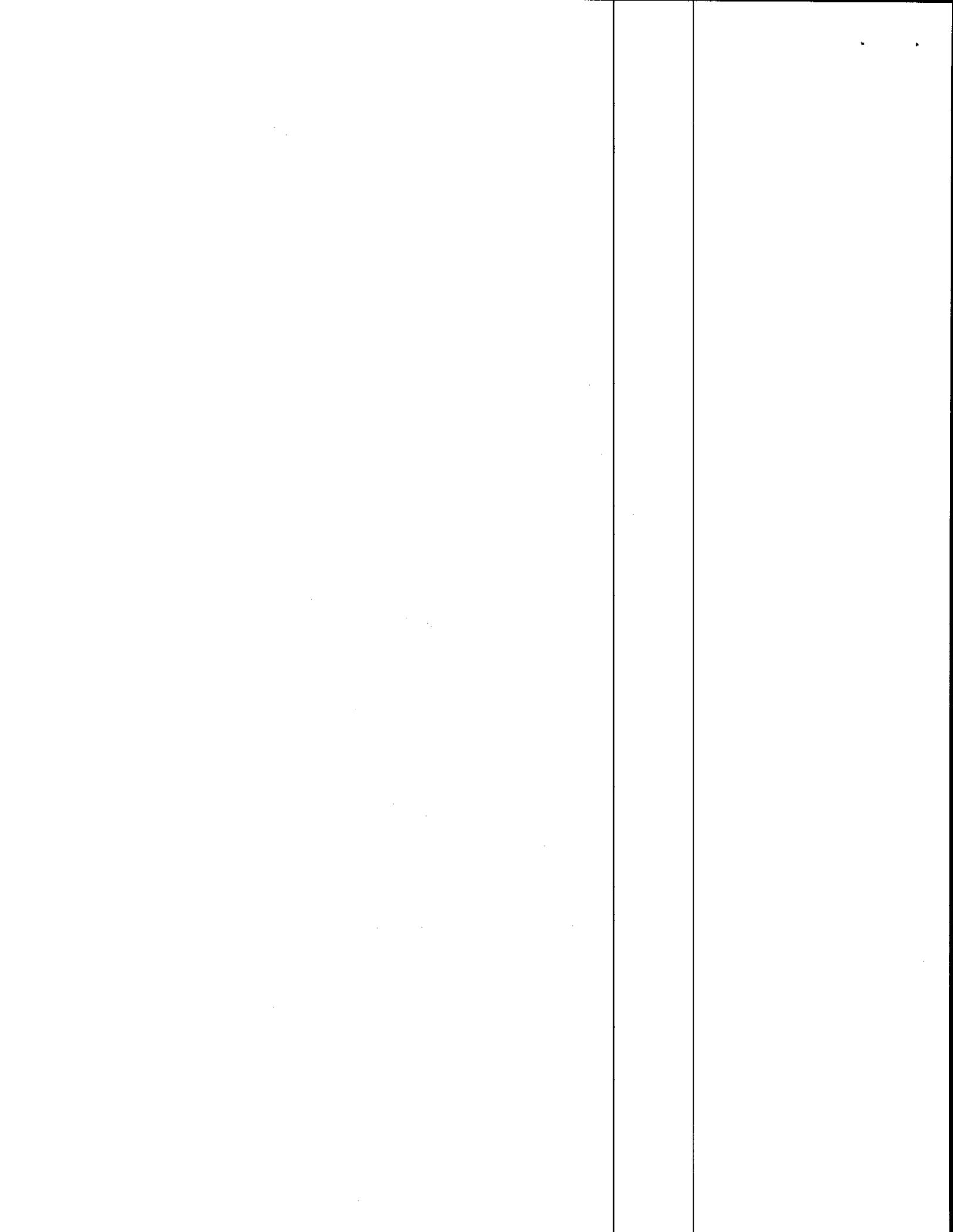
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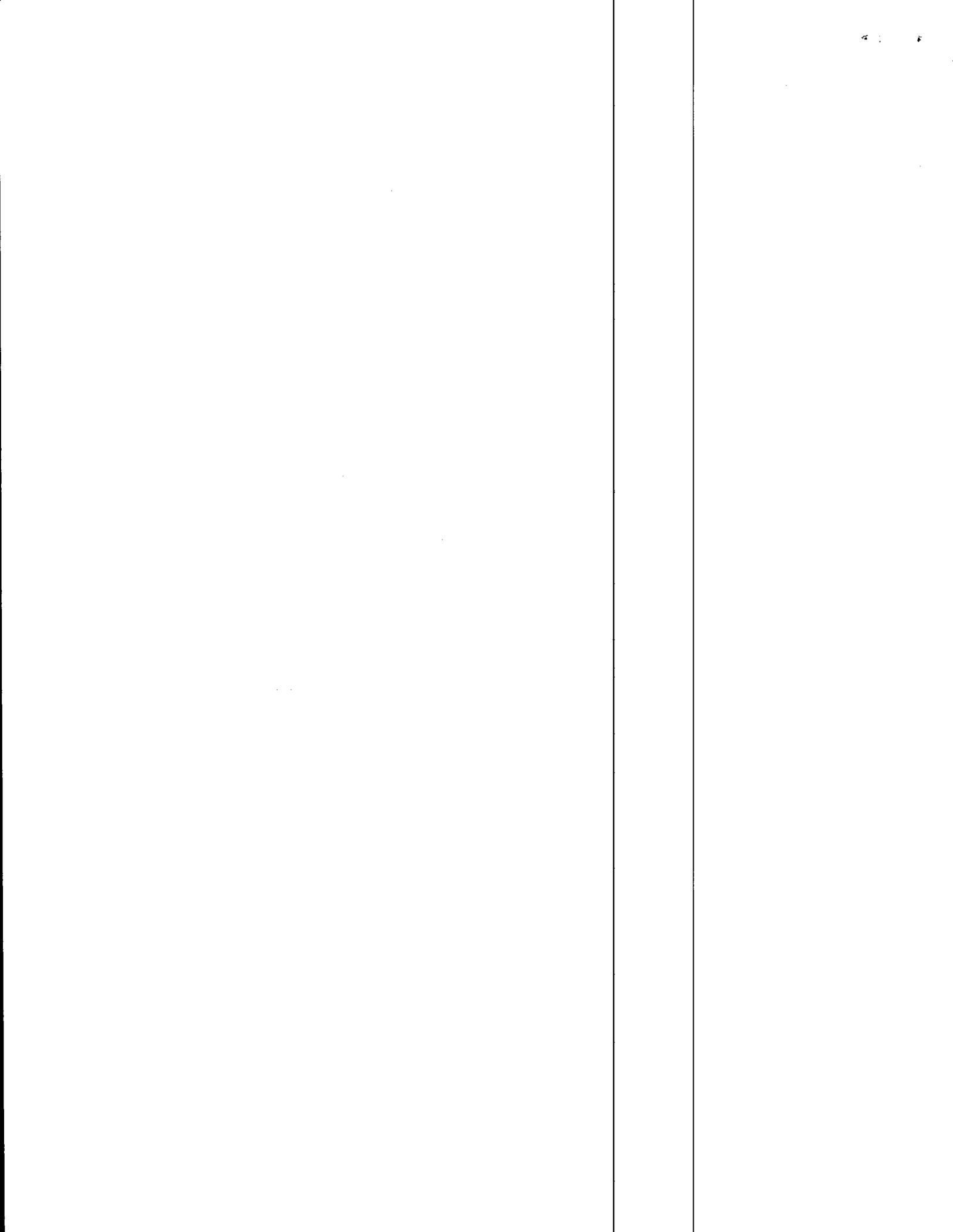
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1001 Front St. Morro Bay, Ca 93442

September 13, 2012

**RECEIVED**

SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

California Coastal Commission  
Mr. Dan Carl  
725 Front Street, Ste. 300  
Santa Cruz, CA 95060-4508

Dear Mr. Carl,

This letter is in regards to an upcoming Commission agenda item for the Pacific Gas and Electric Company's (PG&E) proposed Central Coast Seismic Imaging Project (Project). I am writing to express my deep concerns regarding the approvals that PG&E received from the State Lands Commission including the adoption of the Environmental Impact Report (EIR).

I am the owner and operator of DeGarimore Inc., Giovanni's Fish Market and DeGarimore's Central Coast Marine Fuel and Ice Co. LLC. My businesses are centered around and depend extensively on the commercial fishing industry not just in Morro Bay but, Port San Luis and other transient commercial fisherman.

In my mind, the State Lands Commission failed to consider and address many issues that were raised during the public comment and hearings on this matter. While the EIR considered and addressed some of the other fishing related issues; it failed however to properly identify significant potential impacts to the shore-side support services.

I provided several comments on the Draft EIR and requested consideration for the State Lands Commission to address and adopt appropriate mitigations measures in the Final EIR for the shore-side service businesses like mine. Since these comments were not included or addressed, I wanted to provide excerpts from my previous letters to the Coastal Commission in hopes that you will take action to mitigate this potential damage to the marine life, the shore side support businesses as well as the other fishermen in our area.



**Draft EIR comments provided as it pertains to CEQA:**

It is my understanding that the basic goal of CEQA is to provide for the protection of the environment and specifically to "identify the significant effects of projects". Furthermore under CEQA state guidelines, a proposed project that has possible effects that are individually limited but "cumulatively considerable" shall require a finding that a project may have a "significant effect on the environment". While the DEIR does acknowledge there are significant impacts to the commercial fishing industry, it falls short of fully disclosing the all the impacts by purposefully leaving out the shore-side support businesses.

The State Lands Staff Report included the following comment: "The EIR also describes the survey's potential socioeconomic effects, including adverse economic effects on fishing and fishing-related industry in the Project area. However, because the State CEQA Guidelines stipulate that "economic or social effects of a project will not be treated as significant effects on the environment," the EIR did not quantify or assess these effects for significance, nor identify mitigation or compensation for the effects."

I must respectfully disagree that the State CEQA Guidelines provides PG&E a way out of addressing and providing mitigation measures for the commercial fishing and shore-side support industries that will have significant and unavoidable impacts. While CEQA may be clear that economic or social effects of project shall not be treated as significant effects on the environment, it does state that "Economic or social information may be included in an EIR or may be presented in whatever form the agency desires".

Furthermore, CEQA Guidelines section 15131, Economic and Social Effects, does describe examples for agencies to consider these types of significant and unavoidable impacts in an EIR and provides a mechanism for making this determination. Specifically the sections read as follows:

*15131. (b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant. As an additional example, if the construction of a road and the resulting increase in noise in an area disturbed existing religious practices in the area, the disturbance of the religious practices could be used to determine that the construction and use of the road and the resulting noise would be significant effects on the environment. The religious practices would need to be analyzed only to the extent to show that the increase in traffic and noise would conflict with the religious practices. Where an EIR uses economic or social effects to*



*determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.*

*(c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information on these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project.*

I would respectfully request that the Commission require PG&E and Staff to re-evaluate section 4.13 Commercial Fishing of the EIR and return with mitigation measures and findings as allowed under CEQA to address all of these significant and unavoidable impacts.

***Draft EIR comments provided as it pertains to General Statements:***

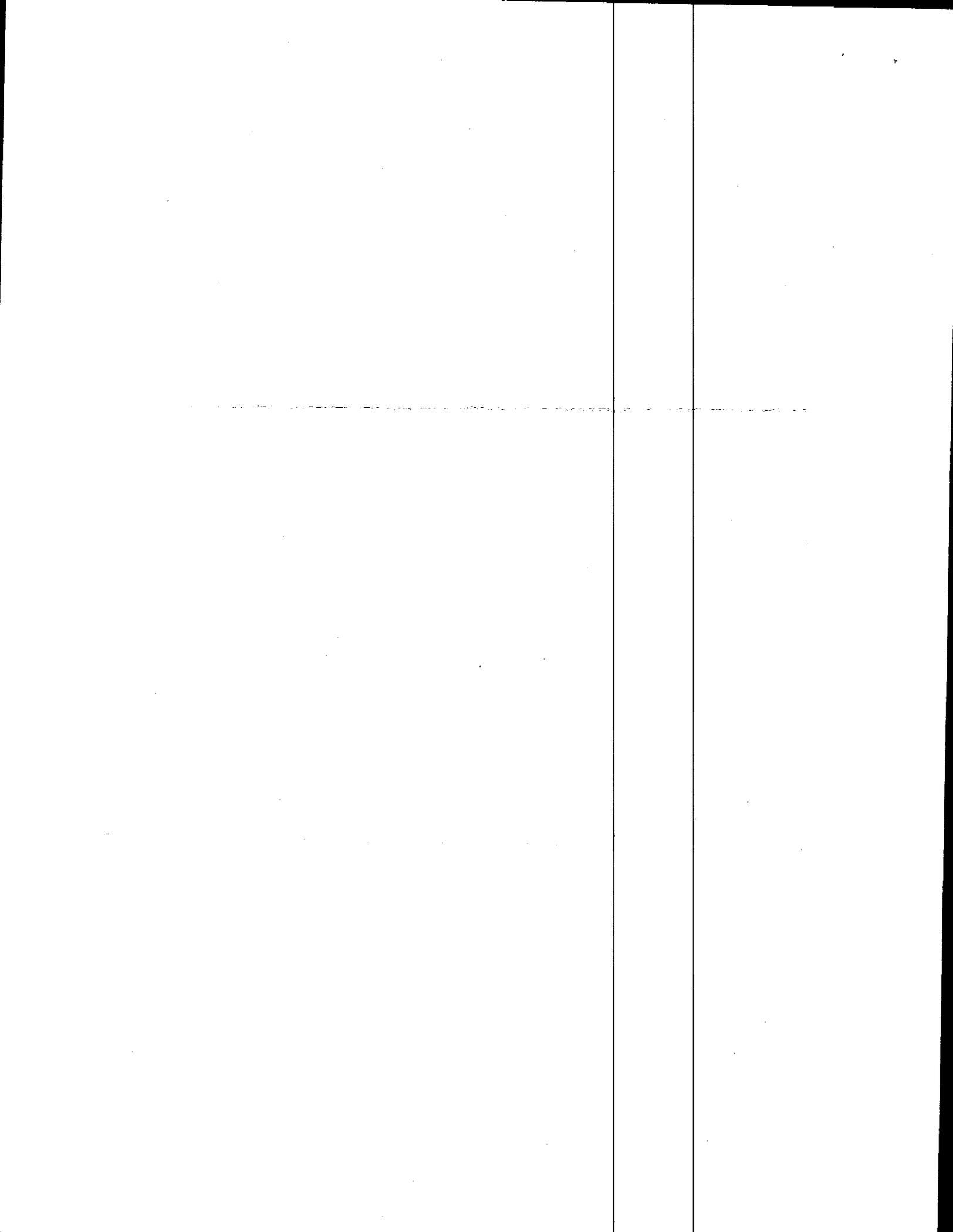
The EIR recognizes in the Executive Summary (page ES-2, lines 24-33) that the Project "could be cumulatively significant" to the commercial fishing industry in both the short and long term. The EIR further and casually mentions that there are associated services that support the fishing industry and are considered integral parts of the coastal-dependent local economy (page 4.13-1, lines 35-37). And again two other nonchalant references in Section 4 to "supporting businesses (e.g., processors)" and a list of infrastructure and services that serve the local commercial fishing industry (page 4.13-16, lines 13-17).

Specifically my operations include four out of the five services listed in the EIR (page 4.13-16, lines 13-17), which are offloading facilities, fuel dock and services, ice production and distribution, fish processing. The significant impacts brought about by the closures during the Project work and the additional unforeseen impacts in the future related to a potential extended Project timeline and marine life disturbance will certainly create a residual effect on my business.

***Draft EIR comments provided as it pertains to Mitigation Measures:***

At the very least the following considerations should be addressed and appropriate mitigations measures provided in the DEIR for the shore-side service businesses like mine:

- Employment of a substantial number of people associated with fish processing, wholesale and retail fish sales, commercial fish unloading operations and fuel/ice services.



- Decline of local available fish that supports the retail, wholesale and export portion of my business.
- Loss of fuel and ice sales due to the inability of the commercial fishing fleet to operate.
- A monitoring program for commercial fish catches and landings over the course of several years to provide adequate data on the short and long term impacts.
- It is imperative that PG&E is required to provide both a short term and long term economic plan that addresses the losses suffered by the Project events.

In conclusion this project clearly has not addressed and provided the appropriate mitigation measures and is not in conformance with the Coastal Act so therefore, I am respectfully asking the Coastal Commission for any assistance that you can render to reverse this wrong way ship before it sails.

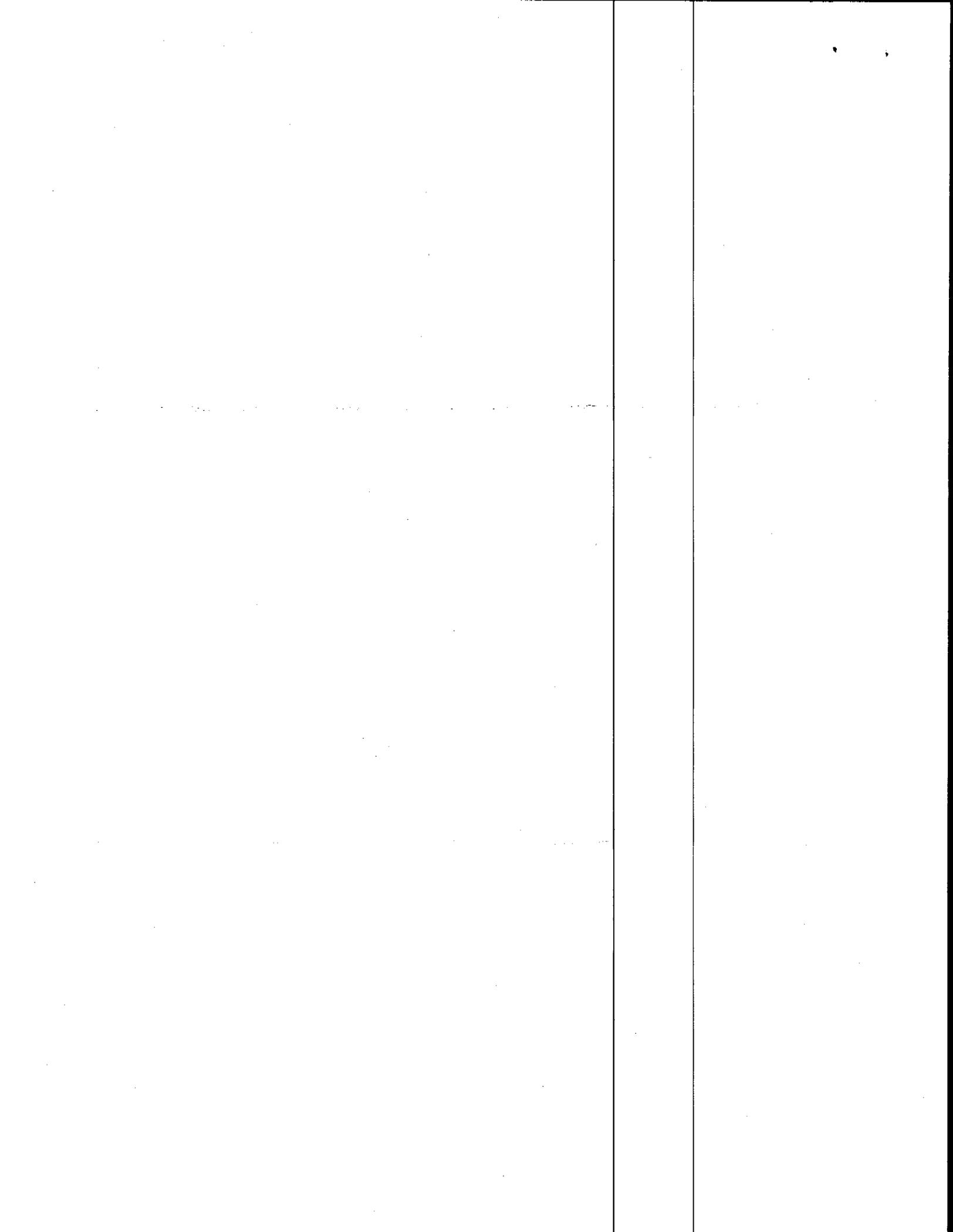
Thank you for your time and consideration in this very important matter.

Respectfully submitted,



Giovanni DeGarimore  
President DeGarimore Inc.  
Giovanni's Fish Market  
DeGarimore's Central Coast Marine Fuel and Ice Co. LLC  
1001 Front Street  
Morro Bay, CA 93442

cc: Senator Sam Blakeslee  
Assembly Member Katcho Achadjian  
Mayor Bill Yates and Council Members, City of Morro Bay  
San Luis Obispo County Supervisor Bruce Gibson





13 September 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director

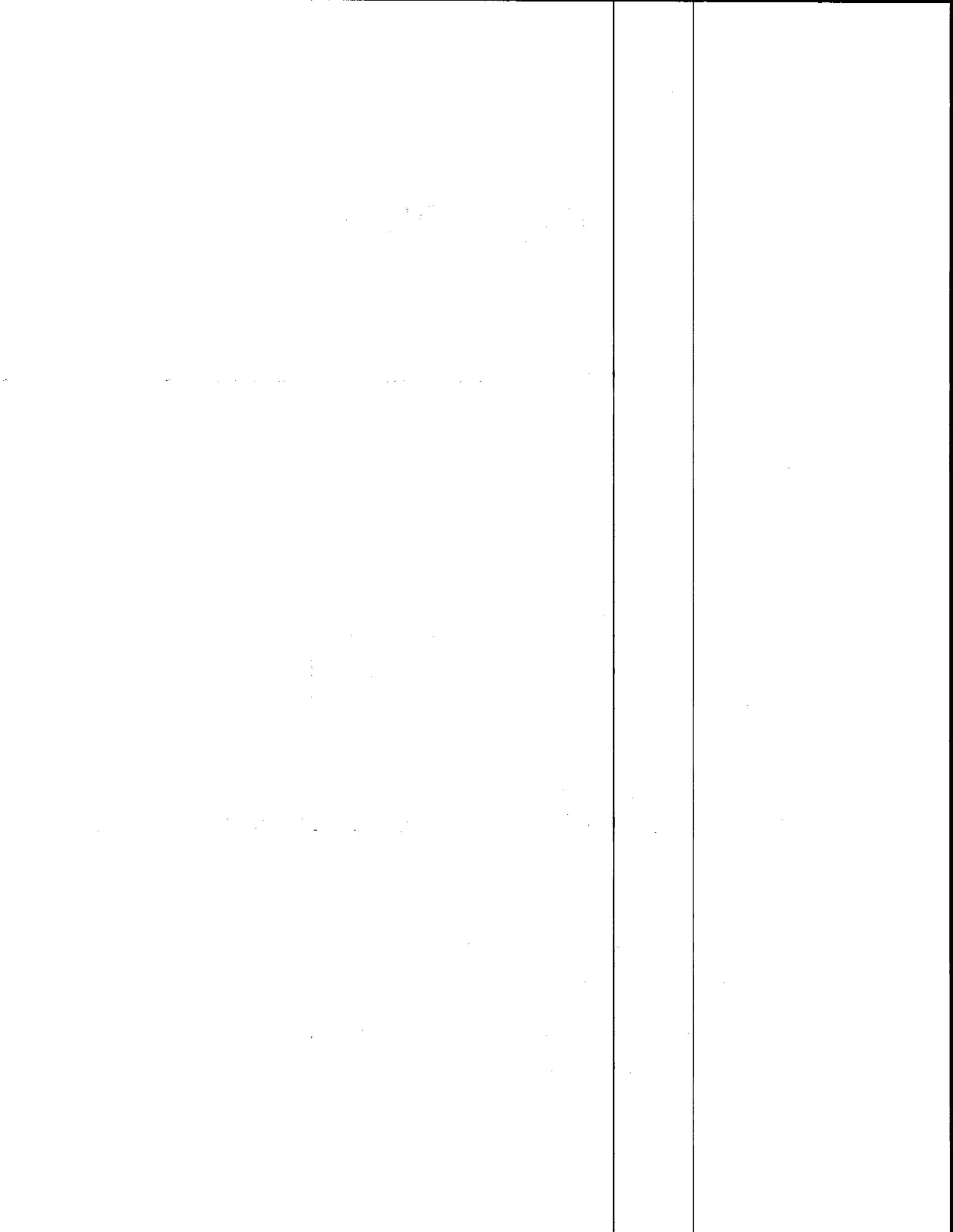
Dear Dan Carl, Deputy Director,

What happens in the seas and oceans around the world causing harm offends mankind. This impacts in a ripple effect on our lives and demonstrates just how fragile the marine ecosystem has become due to the neglect we have perpetrated on it.

After the Japanese tsunami impacting on the Fukushima Nuclear Plant, Germany realised that it could no longer promote a nuclear future.

Yet here you are recommending seismic testing in a marine sanctuary area where untold damage can be done from November 1st onwards.

Yet here you are recommending seismic testing in an earthquake zone where heaven only knows what will happen.

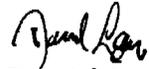


Yet here you are playing Russian Roulette with peoples homes  
lives and safety.

What has gotten into you do you understand nothing of the  
Precautionary Principle?

Please take care with your decisions for they impact far wider  
than you realise and with the opposition to these seismic tests so  
vocal there will exist real desires to hold you accountable.

Yours truly,



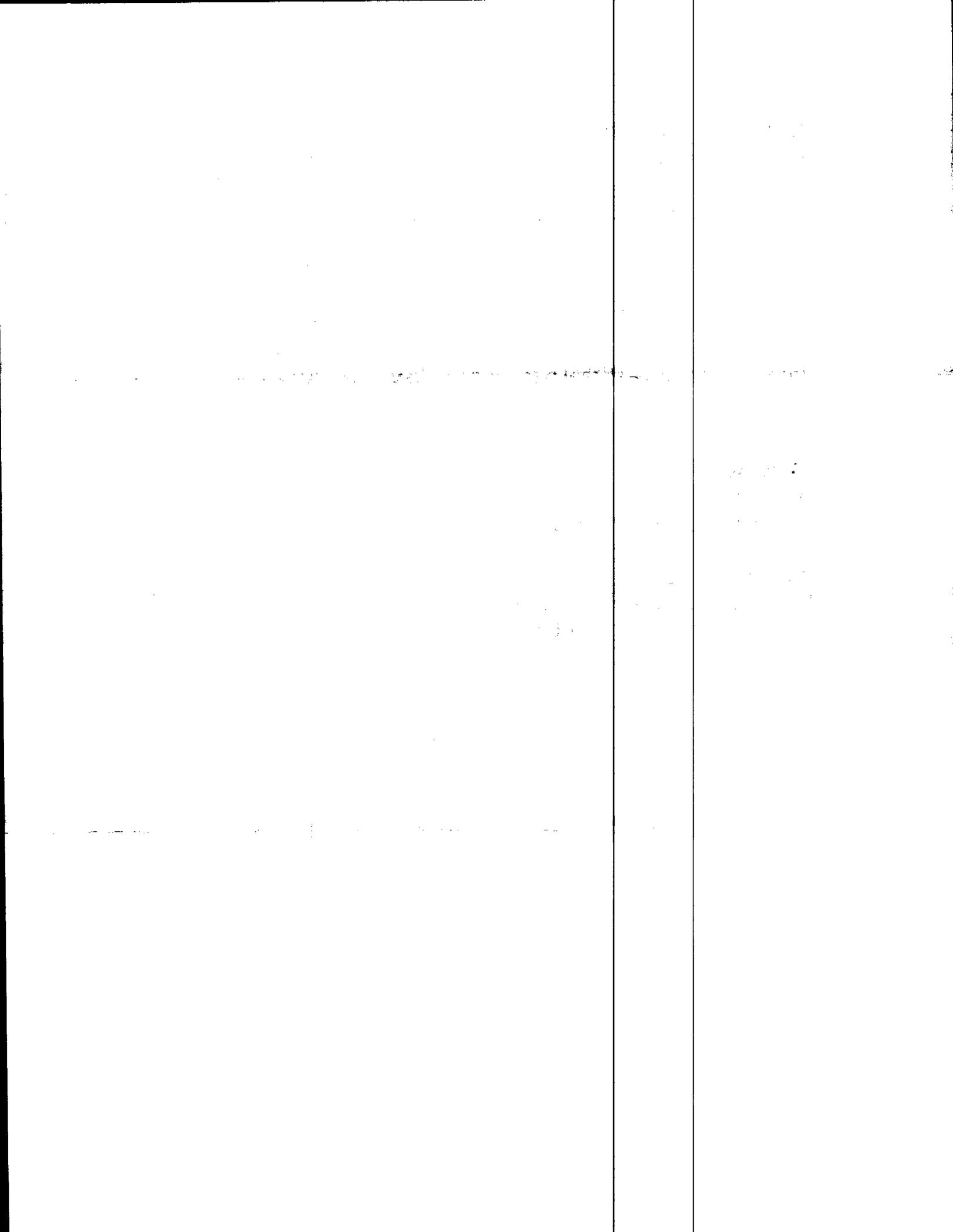
David Levy

levy@dr52.fsnet.co.uk

Chair Marinet

<http://www.marinet.org.uk/>

Friends of the Earth, UK





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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

12 September 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director

Dear Dan Carl, Deputy Director,

I am writing to you as Chairman of Friends of the Earth Marinet Marine Network and also NGO for OSPAR Inter Governmental Protection of the NE Atlantic.

This is a short but forceful letter asking you do not decide to allow PG&E marine seismic testing around their Diablo Canyon Nuclear Plant, near Avila California.

What is proposed will kill marine life, which is not resilient but part of a highly fragile ecosystem. No money can compensate for this destruction.

What is proposed is playing with a real earthquake potential.

It is doing so in geological fault line territory where a nuclear plant lies in wait for a potential tsunami.



That can't happen can it. Ask the Japanese if \$69 million will clear up their mess. PG&E are gambling with the safety of those in Central California without their consent but with yours.

This places you in harms way if the worst happens for you have been warned. We have a similar situation here with frakking to establish gas and oil deposits. Frakking has caused earthquakes here in England. I warrant you have more risk in your backyard with these seismic tests.

Please cancel these tests the Precautionary Principle demands it

Yours faithfully,



Dr. David Levy,  
[levy@dr52.fsnet.co.uk](mailto:levy@dr52.fsnet.co.uk)

Chair Marinet  
<http://www.marinet.org.uk/>  
Friends of the Earth, UK

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for ensuring the integrity of the financial statements and for providing a clear audit trail.

2. The second part of the document outlines the specific procedures that should be followed when recording transactions. This includes details on how to handle receipts, invoices, and other supporting documents, as well as the timing and frequency of record-keeping.

3. The third part of the document discusses the role of the accounting system in the overall financial management process. It highlights how a well-designed system can help to streamline operations and reduce the risk of errors.

4. The fourth part of the document provides a summary of the key points discussed in the previous sections. It reiterates the importance of accuracy and the need for a robust accounting system.

5. The fifth part of the document offers some final thoughts on the subject. It encourages the reader to take the time to review the procedures and to ensure that they are being followed correctly in their own organization.

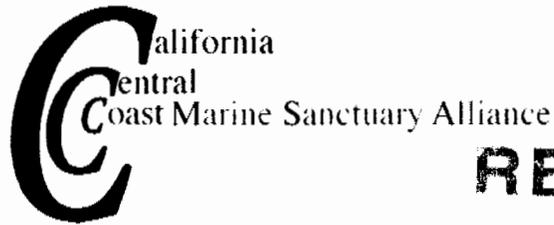
6. The sixth part of the document provides a list of resources that may be helpful for further information. This includes references to relevant legislation, standards, and professional guidance.

7. The seventh part of the document contains a list of definitions for key terms used throughout the document. This is intended to ensure that all readers have a clear understanding of the terminology.

8. The eighth part of the document provides a list of abbreviations used in the document. This is intended to make the document easier to read and to avoid confusion.

9. The ninth part of the document contains a list of references. This includes references to the legislation, standards, and professional guidance mentioned in the previous section.

10. The tenth part of the document provides a list of contact details for the author. This is intended to allow readers to get in touch if they have any questions or comments.



9/12/2012

Central Coast District Office  
Dan Carl, Deputy Director

**RECEIVED**

SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA



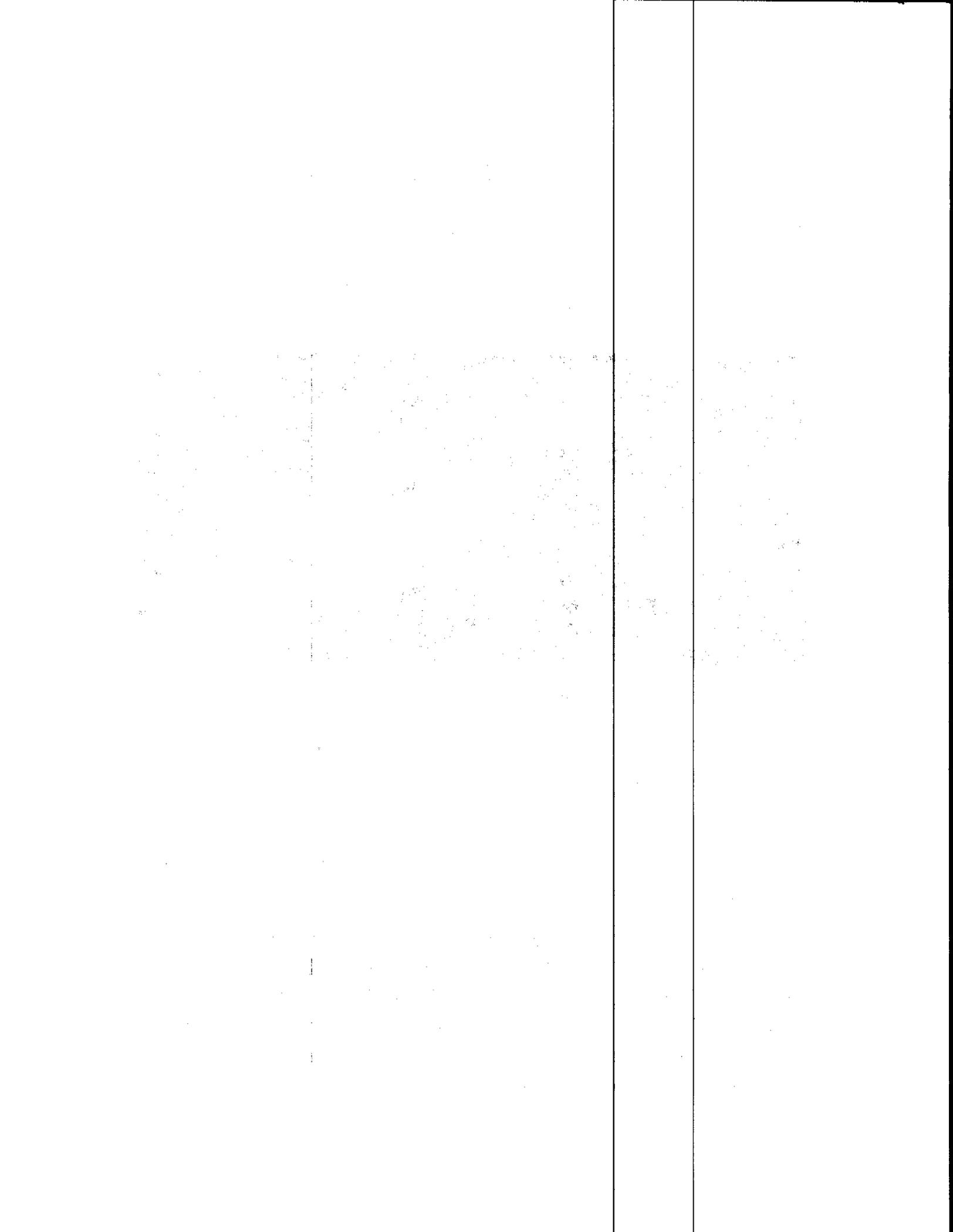
*They Can't Protect Themselves* <http://oceanarmor.org>

**Re: Central Coastal Seismic Imaging Project**

Dear Dan Carl, Deputy Director

The California Central Coast Marine Sanctuary Alliance writes this letter specific to the welfare of Southern Sea Otters during PG&E's Central Coastal California Seismic Imaging Project.

We find the CA State Lands Commission response to the welfare of the Southern Sea Otters unacceptable, and as written, will put about 702 (25% of state's total) of the Southern Sea Otters in danger of great harm and death from the proposed seismic tests, EIR page 4.4-23 states 702 sea otters in project area.



We find the Sea otter study paid for by PG&E unacceptable treatment of sea otters. As reported in the San Luis Tribune:

*PG&E, owner of Diablo Canyon, announced it will fund two research projects that will give biologists a better understanding of the effects this kind of seismic survey work has on marine life, said Jearl Strickland, Diablo Canyon manager of nuclear projects.*

*One project calls for federal wildlife officials to capture 60 sea otters in and around the study area before and again after the surveys. These animals would be tagged and a series of biological samples taken from them. The data collected would tell researchers how the otters respond to the survey work by moving away or experiencing injury or stress.*

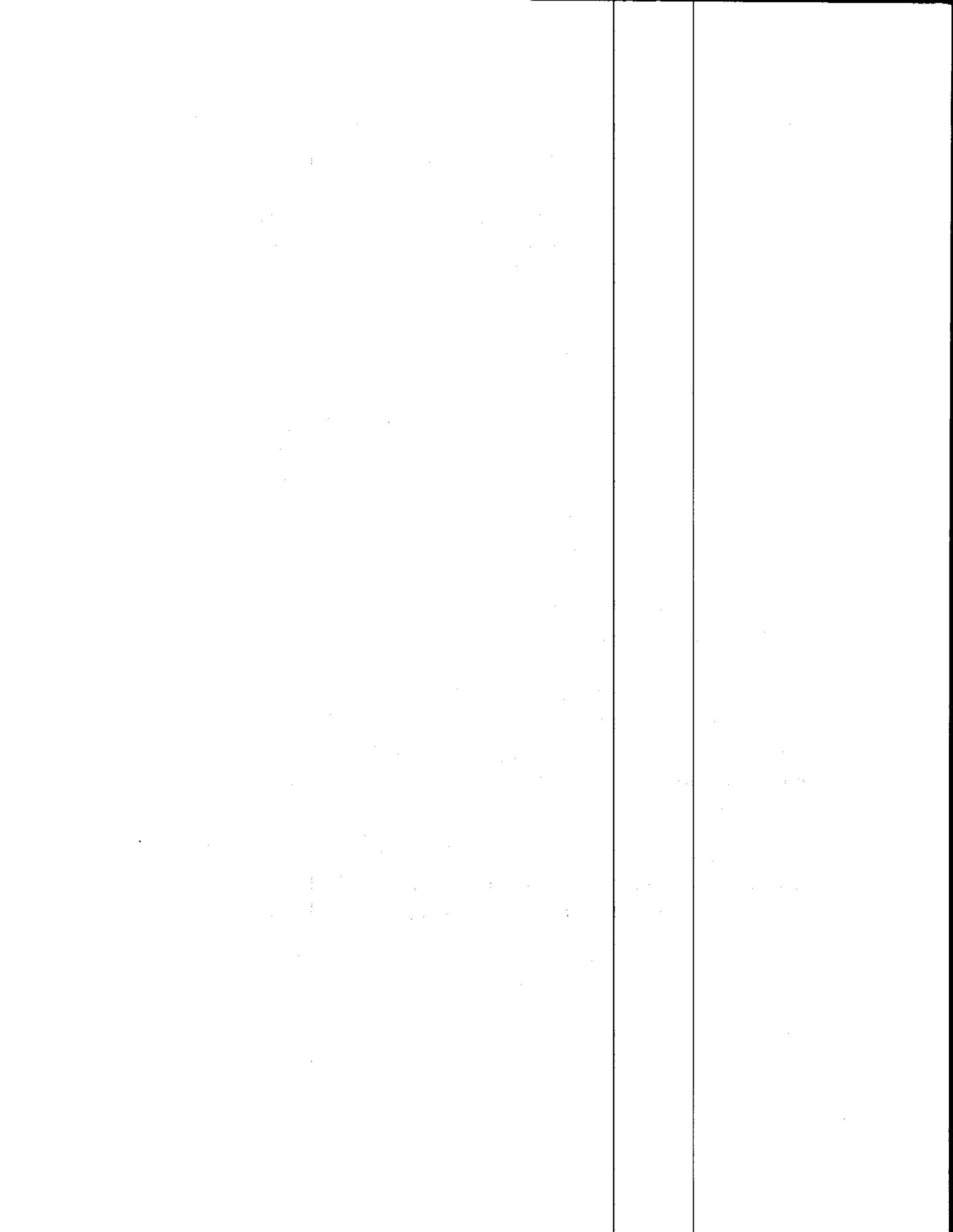
<http://www.sanluisobispo.com/2012/08/09/2180790/some-at-forum-say-diablo-canyon.html#storylink=cpy>  
\*\*\*\*\*

Sea otters have been protected by law since 1911 and are protected as a threatened species under the 1972 Endangered Species Act. There is a small population of sea otters along the coast of central California. There are only two other places they exist in the world.

If the sea otters are to remain within the testing area, the question is: **What intensity (decibels - dB) of seismic testing can sea otters tolerate when diving for food?**

Responding to: Response to Comment Set 3: Fish and wildlife service, U.S. Dept. of the Interior page II-49, 3-3

[http://www.slc.ca.gov/division\\_pages/DEPM/DEPM\\_Programs\\_and\\_Reports/CCCSIP/PDF/FEIR\\_0.3\\_SectionII-Intro.pdf](http://www.slc.ca.gov/division_pages/DEPM/DEPM_Programs_and_Reports/CCCSIP/PDF/FEIR_0.3_SectionII-Intro.pdf)



## MARINEBIO-13

We find the following statement unacceptable and lacking knowledge of sea otters diet and behavior.

“The NMSF Level A threshold for cetaceans (180dB) was used as the Level B threshold for sea otters. **Because sea otters have the ability to avoid immersion of their heads and ears,** this Level A noise level was considered to be appropriate for assessing the extent of disturbance (Level B harassment) to Southern sea otters due to noise.

The above response assumes sea otters can tolerate the 180 dB level because that is what they expect cetaceans to tolerate. Sea otters are not cetaceans, and their level of decibel tolerance is probably closer to that of humans when diving, about 140 dB.

The EIR states: “Noise levels in excess of 154 dB re 1  $\mu$ Pa could be considered potentially harmful to recreational divers *and swimmers* in the Project area”.

One only needs to learn about the sea otters diet and behavior to understand that leaving them within the high seismic testing zone will result in their death. Death will occur from the 250dB sonic blasts every 15 seconds, 24-hours a day for 42 days. Or death will occur from hyperthermia or starvation because of behavioral changes caused by the blasting.

### **Death by Seismic Testing**

Sea otters are not comparable to whales in determining the level of seismic blasts they can withstand. They need to have no more intensity than would be recommended for humans.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud. The text also notes that clear and concise reporting is crucial for management decision-making.

2. The second part of the document outlines the various methods used to collect and analyze data. It describes the process of gathering information from different sources and how this data is then processed to identify trends and patterns. The importance of using reliable data sources is also highlighted.

3. The third part of the document focuses on the role of technology in modern data analysis. It discusses how advanced software tools and algorithms have revolutionized the way data is handled, allowing for more complex and detailed analyses than ever before.

4. The fourth part of the document addresses the challenges of data security and privacy. It discusses the risks associated with data breaches and the importance of implementing robust security measures to protect sensitive information. The text also touches on the legal and ethical considerations surrounding data collection and use.

5. The final part of the document provides a summary of the key points discussed and offers some concluding thoughts on the future of data analysis. It suggests that as technology continues to advance, the field of data analysis will become increasingly important and complex, requiring ongoing research and innovation.

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15. The final part of the document provides a summary of the key points discussed and offers some concluding thoughts on the future of data analysis. It suggests that as technology continues to advance, the field of data analysis will become increasingly important and complex, requiring ongoing research and innovation.

## **Death by Hyperthermia**

Sea otters need to eat about 25% of the weight in food each day in order to retain their body heat as they have no blubber. Not being able to dive to get their food due to intense seismic blasting will result in them not eating enough to maintain their body heat.

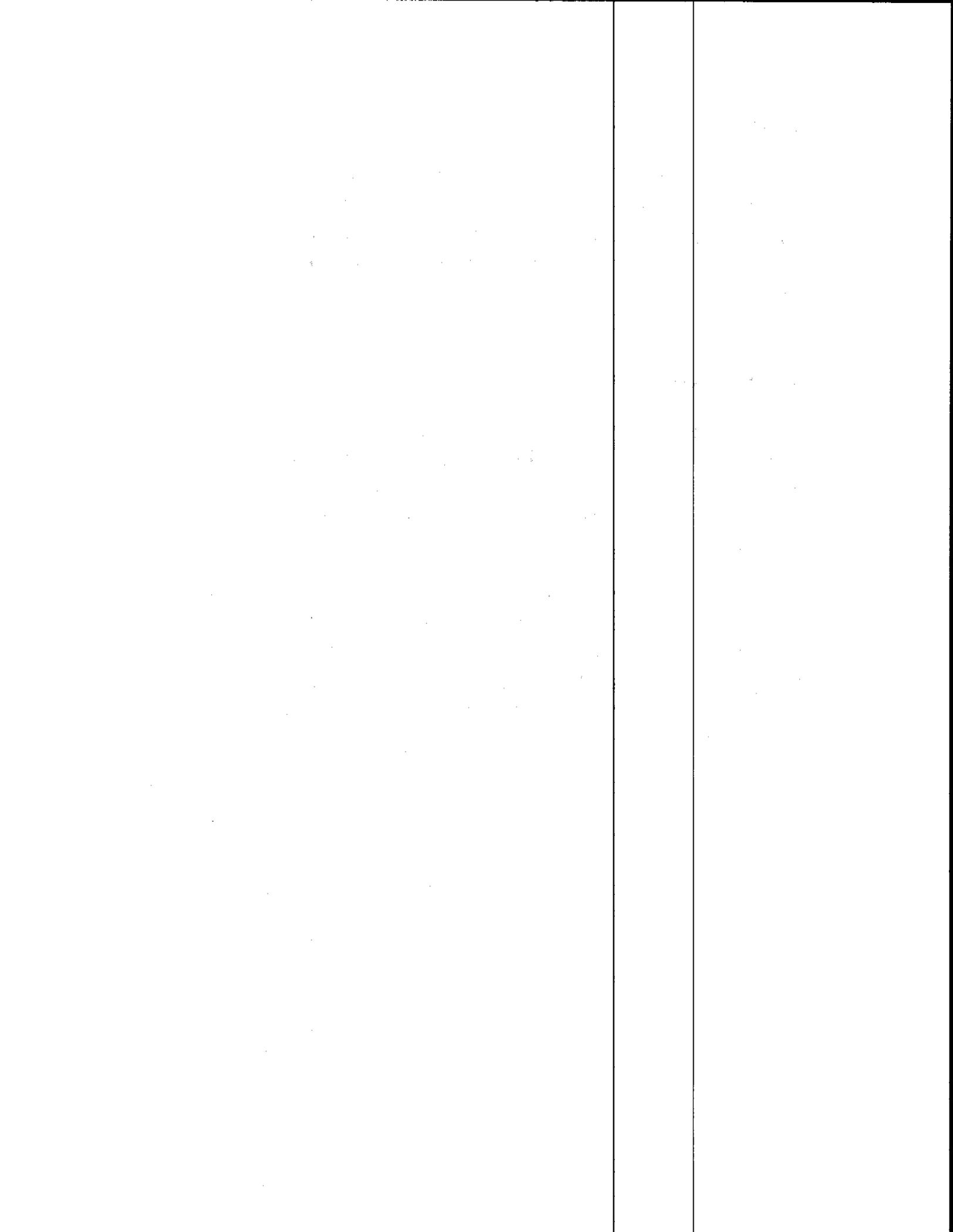
## **Death by Starvation**

Sea otters spend much of their lives in the water and can dive up to 330 feet when foraging for food. The reason they dive is that the food is on the bottom of the ocean. Therefore, the intensity of the seismic blasts will determine if the sea otters can tolerate diving for their food.

Sea otters eat many kinds of invertebrates, including clams, snails, sea stars, sea urchins, crabs, squid, octopuses and abalone. This food lies at the bottom of the ocean, where they also pick up a rock. They carry the food and the rock up to the surface. Then they use the rock or other objects to pry and to hammer them open.

We respectfully ask that you either deny or postpone the high level seismic tests until fall of 2013. Not rushing forward with these high intensity seismic tests will give the peer group and PG&E time to review and evaluate the land tests and the low level ocean tests. High intensity ocean seismic testing should only occur after these evaluations.

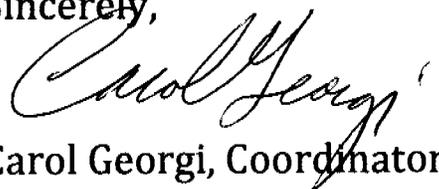
Our ocean life and marine food supply are too valuable to recklessly destroy. Please apply the Precautionary Principle as you make your decisions.



If you choose to permit the seismic testing, we urge you to take the necessary steps to protect the sea otters, even if it means removing them from the project area and requiring PG&E to pay for the necessary removal and relocation.

Thank you for considering these comments,

Sincerely,



Carol Georgi, Coordinator

California Central Coast Marine Sanctuary Alliance

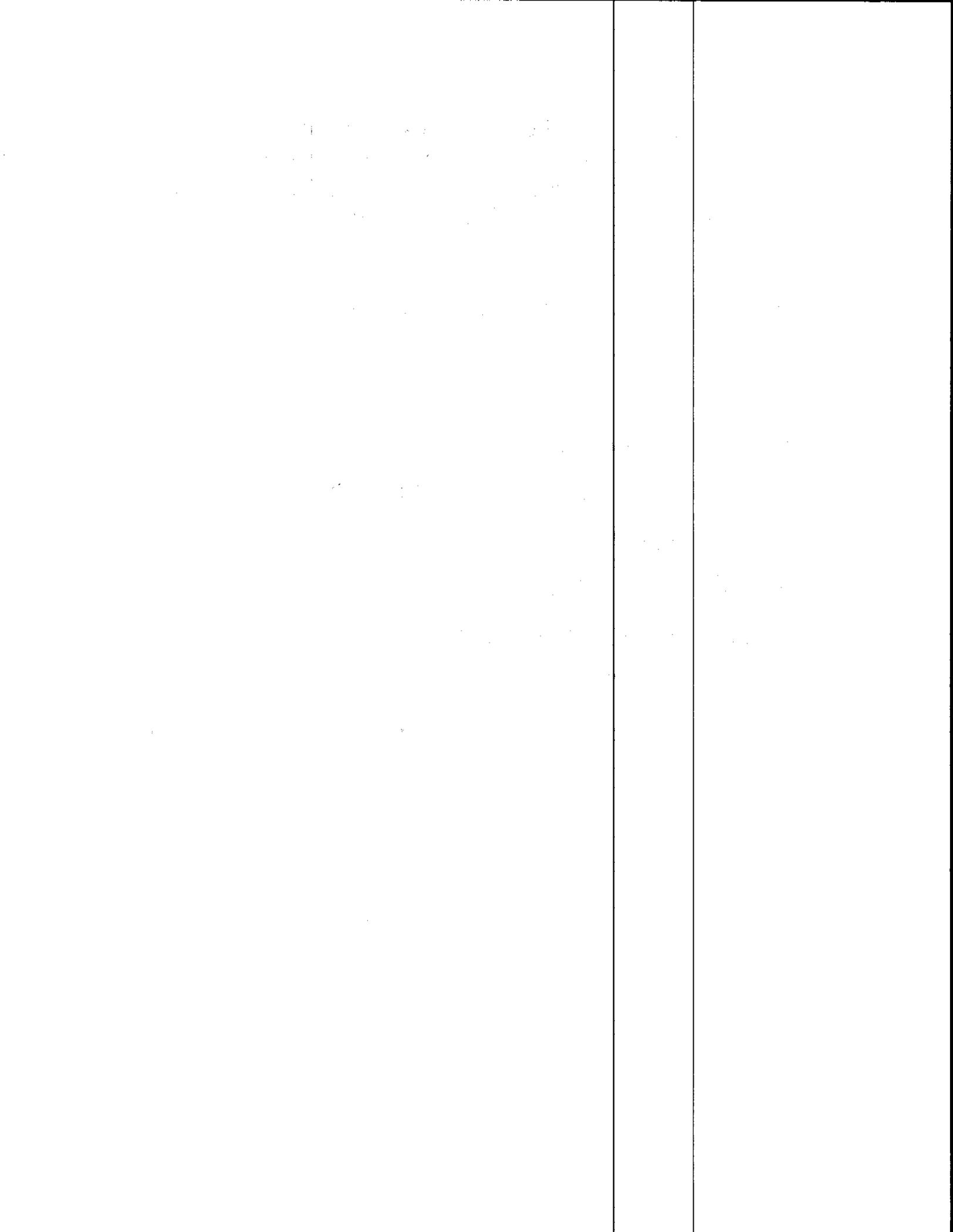
Email- [cdgeorgi@hotmail.com](mailto:cdgeorgi@hotmail.com)

Address: P.O. Box 13222

San Luis Obispo, CA 93406---3222

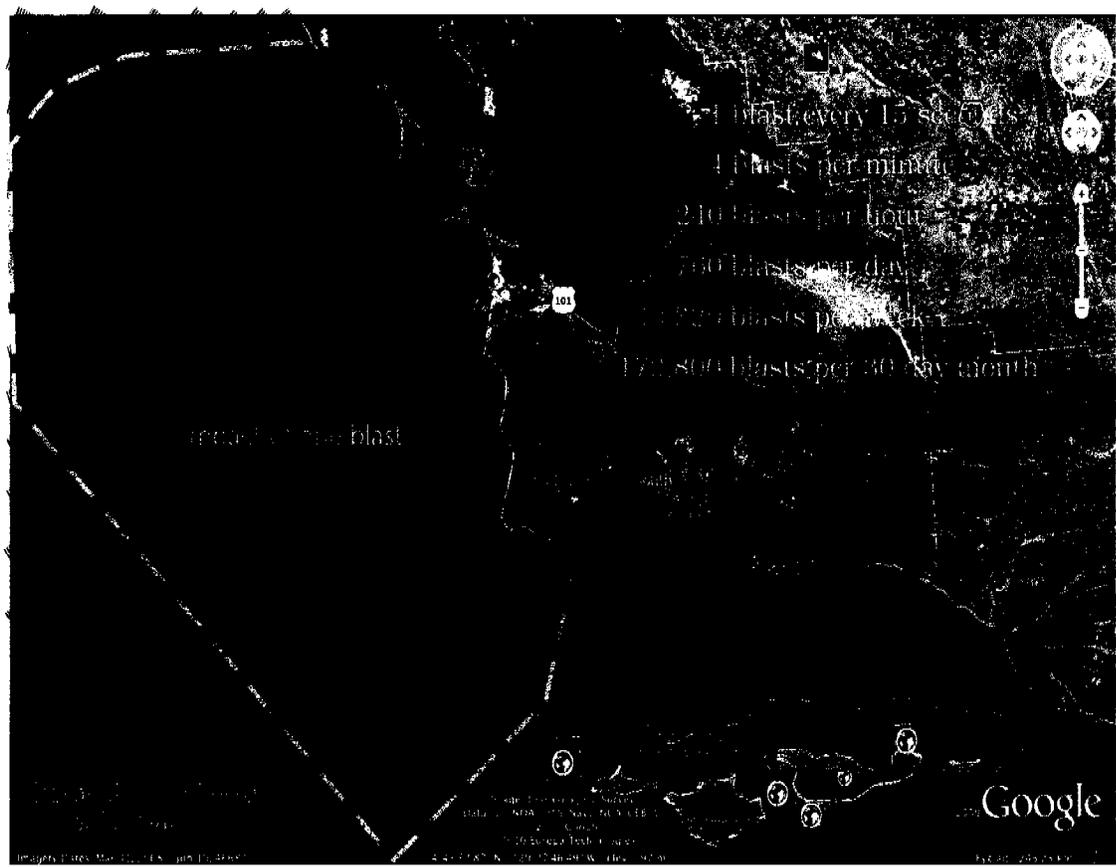
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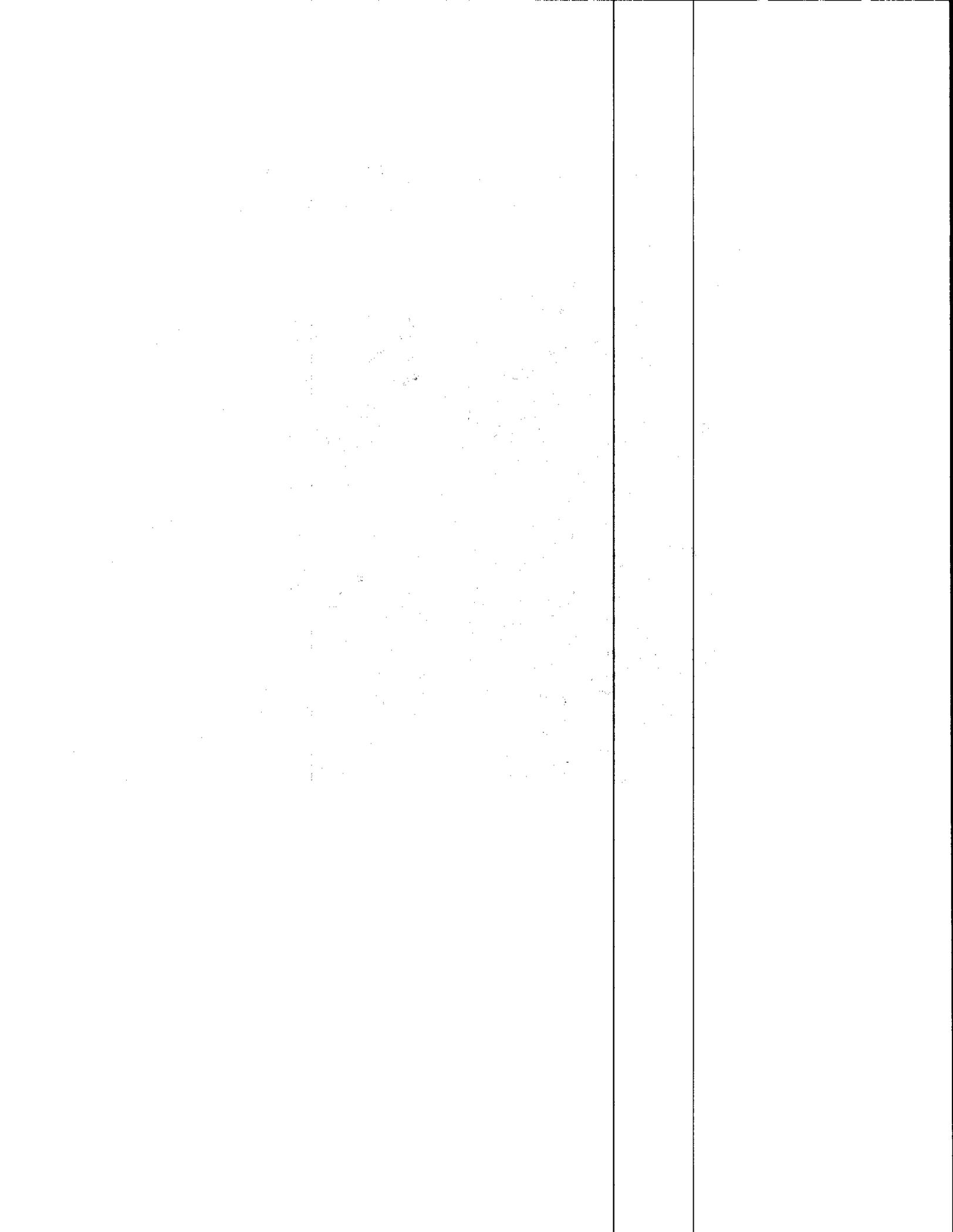




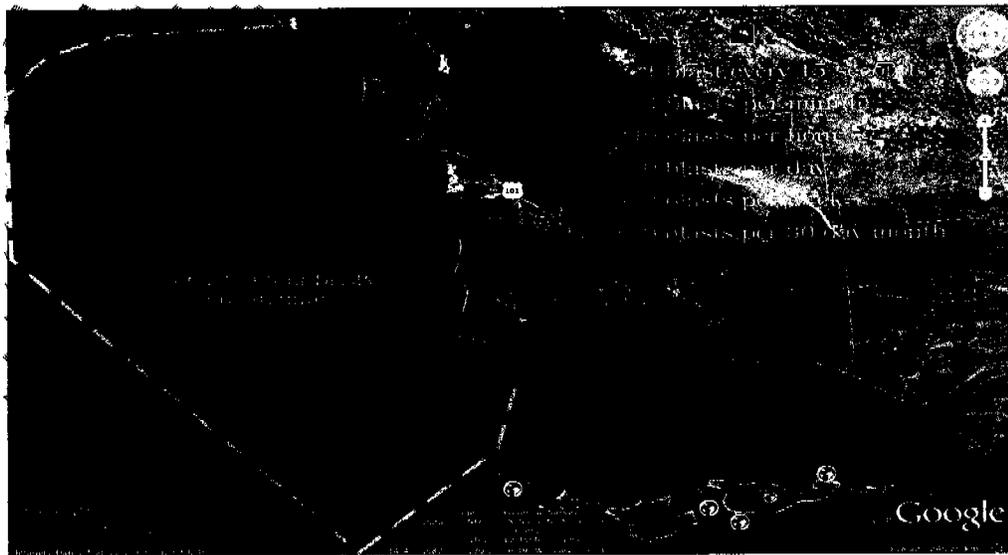
# Maps (by Karl Kempton, former Energy Planner of San Luis Obispo County) show combined effect of constant blasting

## Impact of one blast

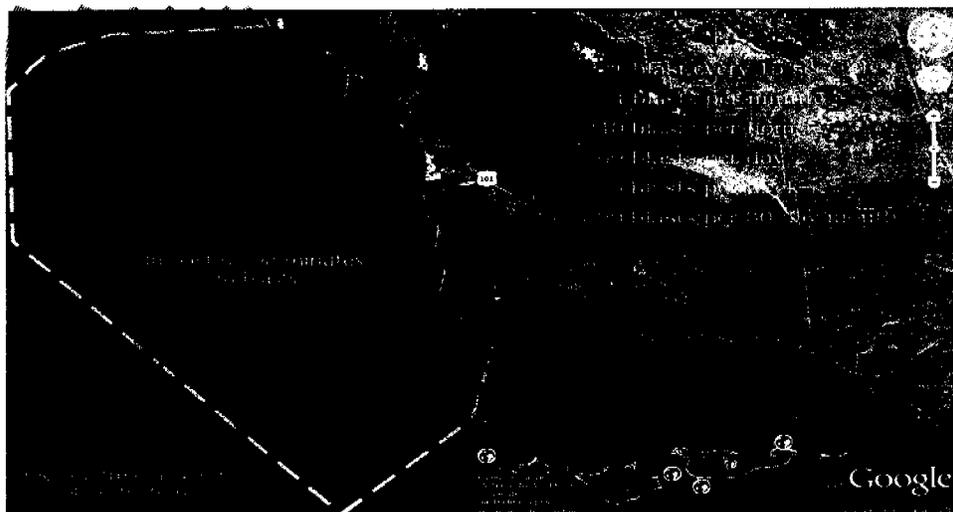


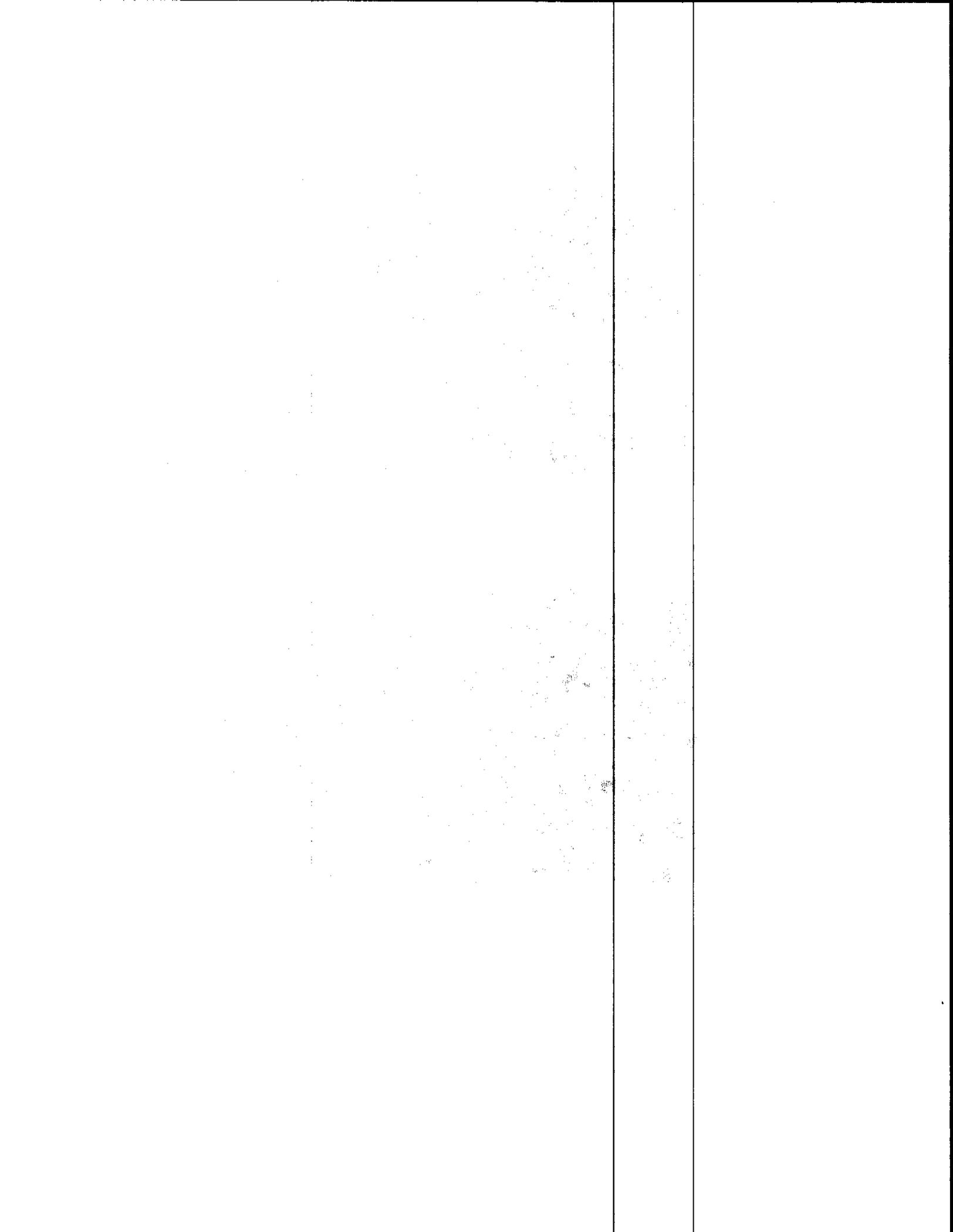


Impact of 4 blasts in one minute



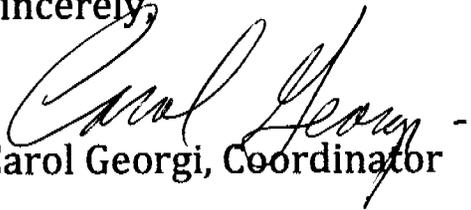
Impact of 40 blasts in 10 minutes





Thank you for considering these comments,

Sincerely,



Carol Georgi, Coordinator

California Central Coast Marine Sanctuary Alliance

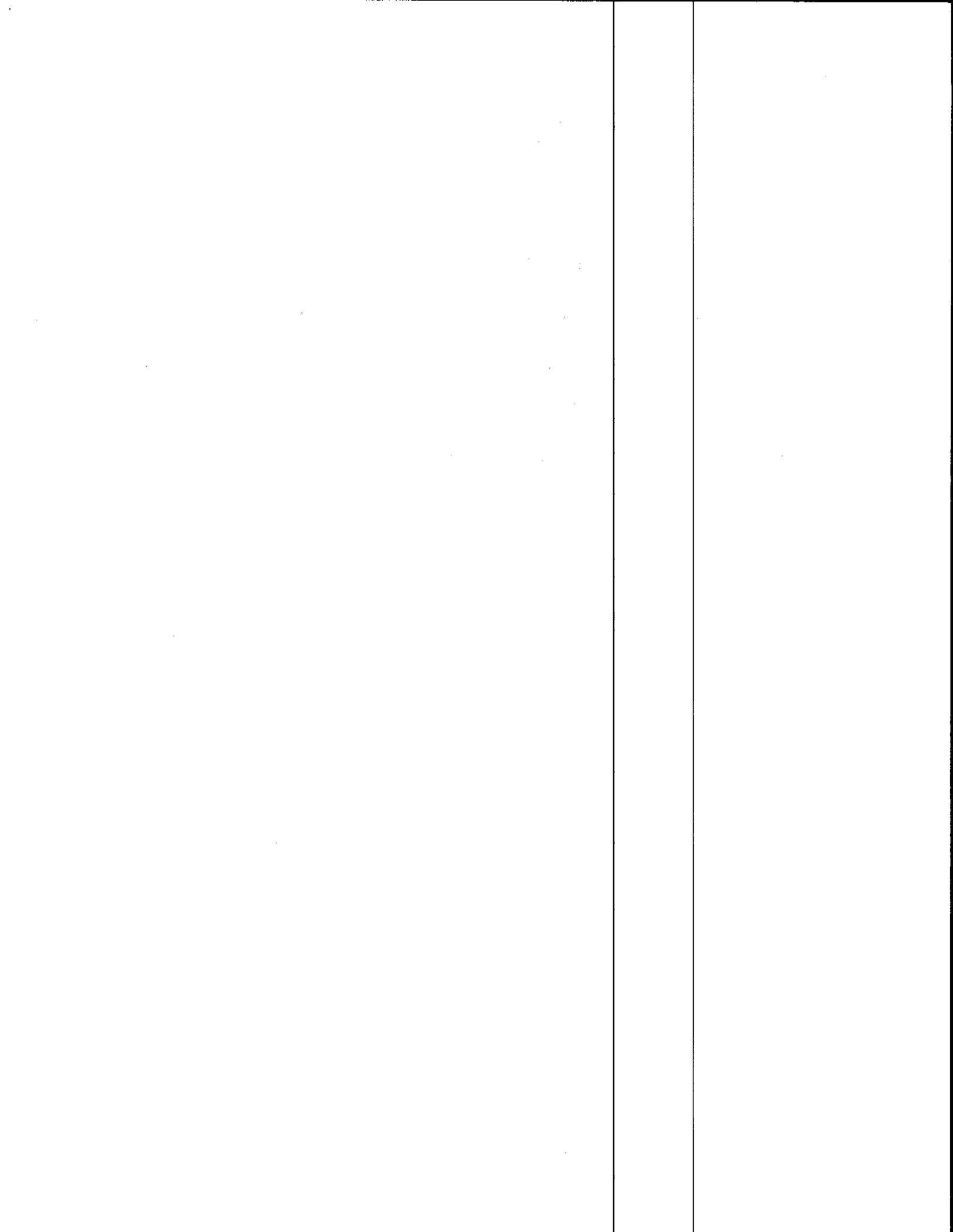
Email- [cdgeorgi@hotmail.com](mailto:cdgeorgi@hotmail.com)

Address: P.O. Box 13222

San Luis Obispo, CA 93406---3222

<http://themsa.org/themsa/Welcome.html>







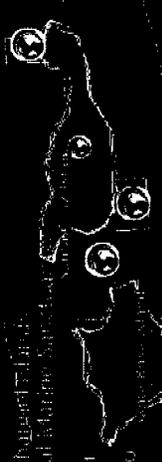
- 1 blast every 15 seconds
- 4 blasts per minute
- 240 blasts per hour
- 5,760 blasts per day
- 10,800 blasts per week
- 172,800 blasts per 30 day month

Impact of one blast

San Joaquin Water Trough

Ocean Area In Need  
of Protection

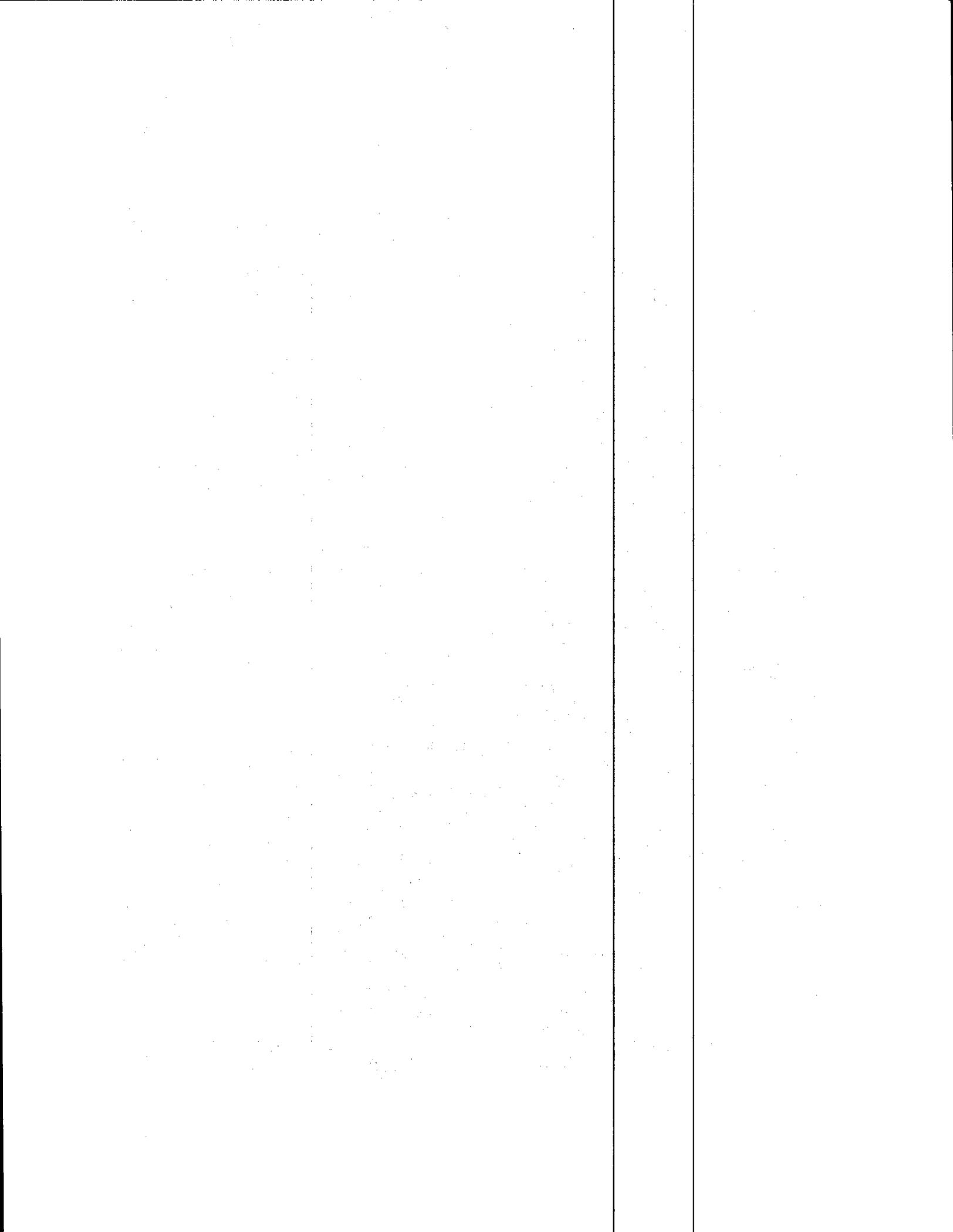
Imagery Dates: Mar 31, 2008 Jun 10, 2007



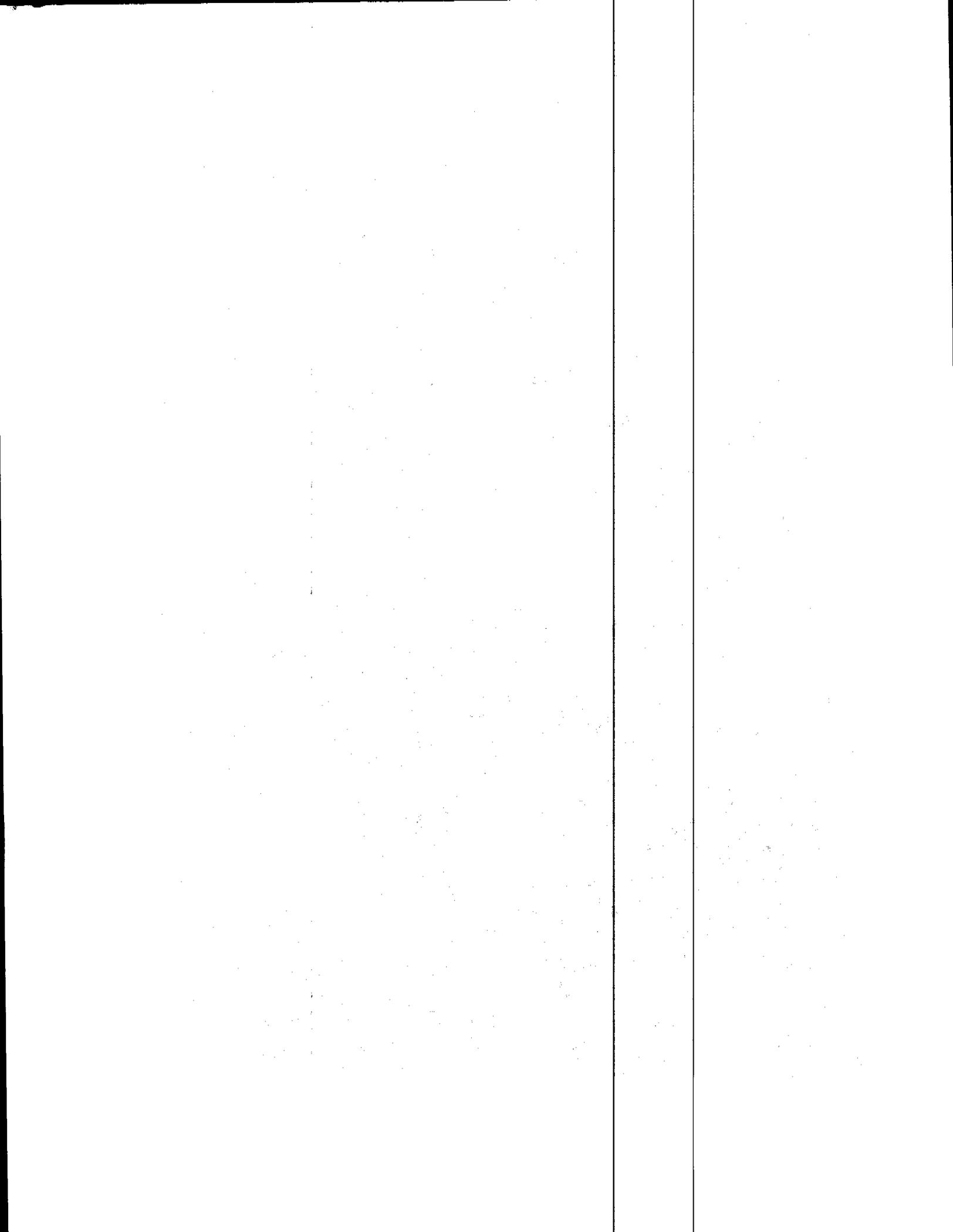
Charleston, CA  
 Federal Airborne Survey  
 National Geospatial Survey  
 Data © 2008 Google  
 34°40'46.00" N 120°27'46.49" W elev: 397 m

Google

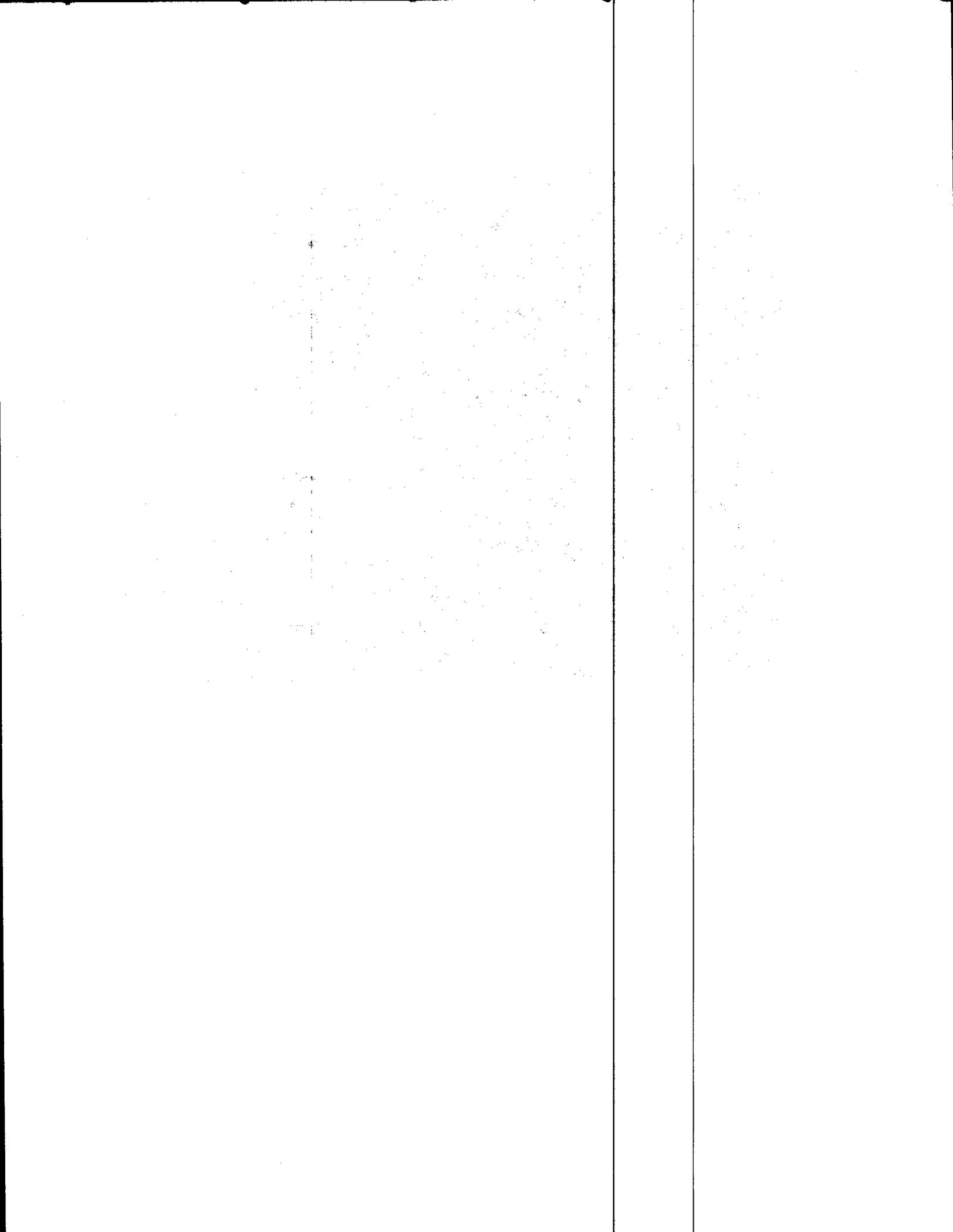
Eye alt: 245.23 km











California Coastal Commission  
Attention: Cassidy Teufel, Coastal Analyst  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

**RECEIVED**

September 10, 2012

**SEP 12 2012**

CALIFORNIA  
COASTAL COMMISSION

Dear Commissioners:

We thank you for the opportunity to provide input into the potential environmental and economic impacts of the proposed high energy seismic surveys (HESS) to be conducted by PG&E off the coast of Morro Bay and Diablo Canyon Power Plant. The Nature Conservancy (TNC) has been working closely with local fishermen for the last several years on a project to enhance the environmental and economic performance of the groundfish fishery. This collaboration among industry, NGOs, and state and federal agencies to date has resulted in reduced bycatch for overfished rockfish, higher profits to local fishermen, collaborative fisheries research projects, and the use of modern technology to streamline data collection efforts.

We have two major concerns with the proposed offshore seismic surveys by PG&E including: 1) the potential impacts to the marine ecosystem and fisheries, especially the deeper water component of the groundfish fishery and existing federal fishery closures that were not adequately addressed in the final EIR, and 2) the impact to the partnership and progress of fishermen, community representatives and conservation groups who have been working to transitioning the local fishery to greater economic and environmental sustainability. We encourage fair and equitable mitigation measures to help address any of the economic impacts to commercial and recreational fishermen in the area.

We have been working closely with PG&E to provide input into the design of a monitoring program to better assess the short and long-term effects on fish abundance from the seismic testing. While the monitoring plan listed in the final EIR calls for assessing the potential impacts to near-shore fish species in state waters, it does not adequately address potential impacts to other marine species and critical areas of concern in deeper water habitats, particularly the Rockfish Conservation Areas (RCAs) that were designated and implemented by NMFS in 2002 to help with rebuilding efforts for overfished species. Together with our collaborative research partners, we submitted recommendations to PG&E for how visual surveys with a Remotely Operated Vehicle (ROV) could be conducted in the area before, during, and after testing to provide estimates of abundance and fish behavior in response to the seismic surveys. We recommended that replicated visual surveys be conducted in both shallow and deeper habitats at sites where there is available baseline data, including the Pt. Buchon MPA, Church Rock inside the non-trawl RCA, and at control locations with similar habitat types such as the Pt. Sur MPA to the north. PG&E has been responsive to our input and we hope that their final monitoring plan is designed to obtain a more comprehensive understanding of the short and long-term effects of the sound impacts on fish and other species.

Finally, the potential impacts of the seismic testing on fishing operations and fish species could result in economic impacts to the ports of Morro Bay and Port San Luis. Insufficient mitigation measures could have potentially serious repercussions for these commercial and recreational fishing communities and the local port infrastructure that helps support them. Morro Bay recently received the 2012 Walter B. Jones Awards for Excellence in Coastal and Ocean Management awarded by the National Oceanic and Atmospheric Administration for their efforts to improve the sustainability of their fisheries and coastal ecosystems and those efforts should be supported.

We hope that you ensure that there are adequate monitoring plans and mitigation plans in place before approving this project. We are happy to discuss this with you further if you have any questions. Thank you for your consideration.

Sincerely,



Dr. Mary Gleason  
Associate Director of Science, The Nature Conservancy  
99 Pacific Street, Suite 200G  
Monterey, CA 93940  
(831) 333-2049 email: [mgleason@tnc.org](mailto:mgleason@tnc.org)


September 4, 2012

243 Vista Del Mar Ave  
Pismo Beach, CA 93449

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director

Dear Dan Carl,

**Please do not permit the pending PG&E Seismic Survey in the ocean near Diablo Canyon Nuclear Power Plant.**

The location of the survey area sits between two National Marine Sanctuaries and has itself qualified for National Marine Sanctuary Designation since 1990.

The sonic blasts will be too intense at 250 decibels for marine life to remain viable. The entire marine web-of-life will be destroyed.

At least postpone permitting for one year while more research, comments and concerns can be collected and analyzed.

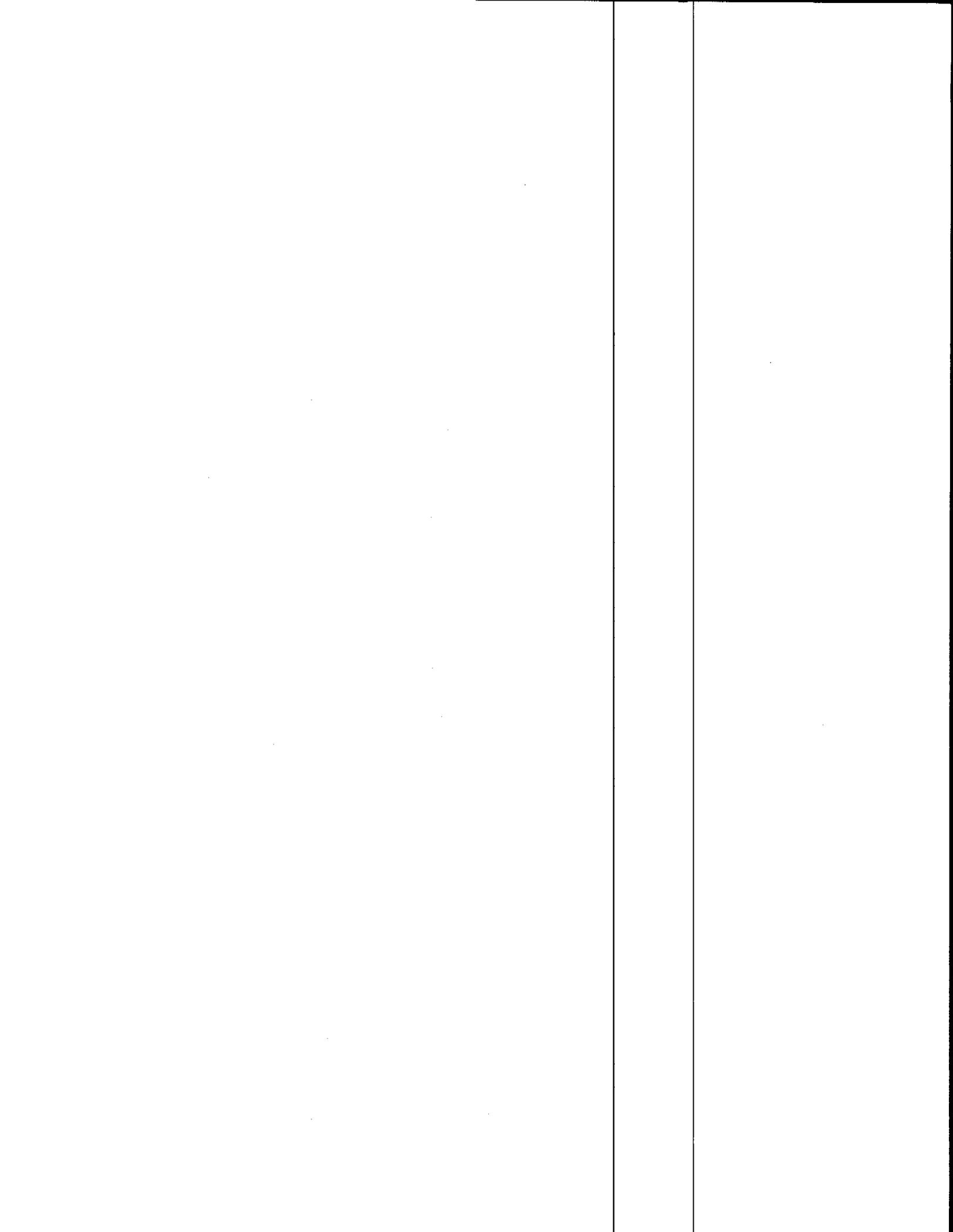
The coastal communities are not prepared for this ocean disaster that will end commercial fishing for an unknown length of time.

The Morro Bay and San Luis Harbor fishermen have worked for decades to create sustainable locally "branded" fishing. They now stand to lose their livelihoods.

There is no mitigation for returning the fish and their web-of-life.

One-third of California's sea otters may die from the seismic testing or from hypothermia and starvation from the destruction of their food source.

The sea birds who depend on the ocean for their food will die of starvation as they have in Norway after seismic testing. Watch this video to hear from the fisherman who has been waiting for more than 3 years for the fish to "return." <http://youtu.be/nGfoZ7WkxIM>



Therefore, rushing to permitting is not advisable for the communities and the marine life.

The attached article "Seismic Surveys and MPA's: How Should Managers Address the Issue of Underwater Noise?" is from the MPA News, Vol. 11, No.3 November-December 2009.

<http://depts.washington.edu/mpanews/MPA111.htm#seismic>

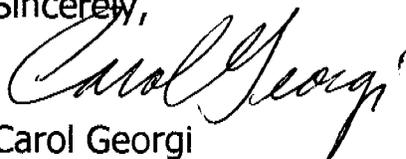
**states: The US National Marine Fisheries Service, for instance, has set a standard that the received sound level for impulsive signals - such as those produced by airguns in seismic surveying - should be no more than 180 decibels (dB) for cetaceans and 190 dB for pinnipeds.**

and

**proposed that the radius of the safety zone around the vessel be expanded to 7 km: the goal would be to reduce received sound to a maximum of 160 dB outside the zone. (A threshold of 160 dB is believed by some marine mammal researchers to be the point above which behavioral disturbance can occur.)**

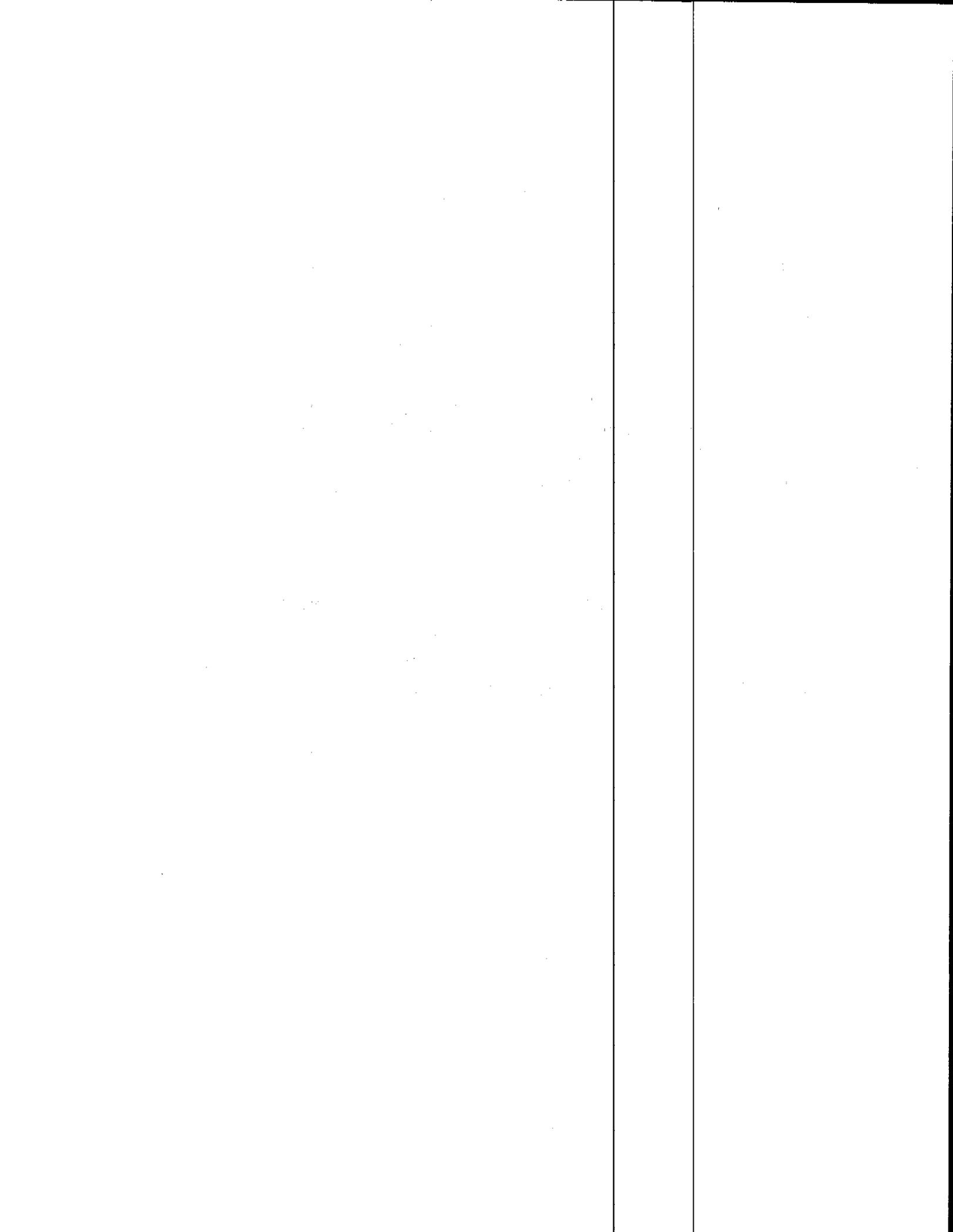
Hopefully this research information will help you with your important, precedent-making decisions regarding the proposed PG&E seismic survey.

Sincerely,



Carol Georgi

[http://slocoastjournal.com/docs/marine\\_sanctuary.html](http://slocoastjournal.com/docs/marine_sanctuary.html)

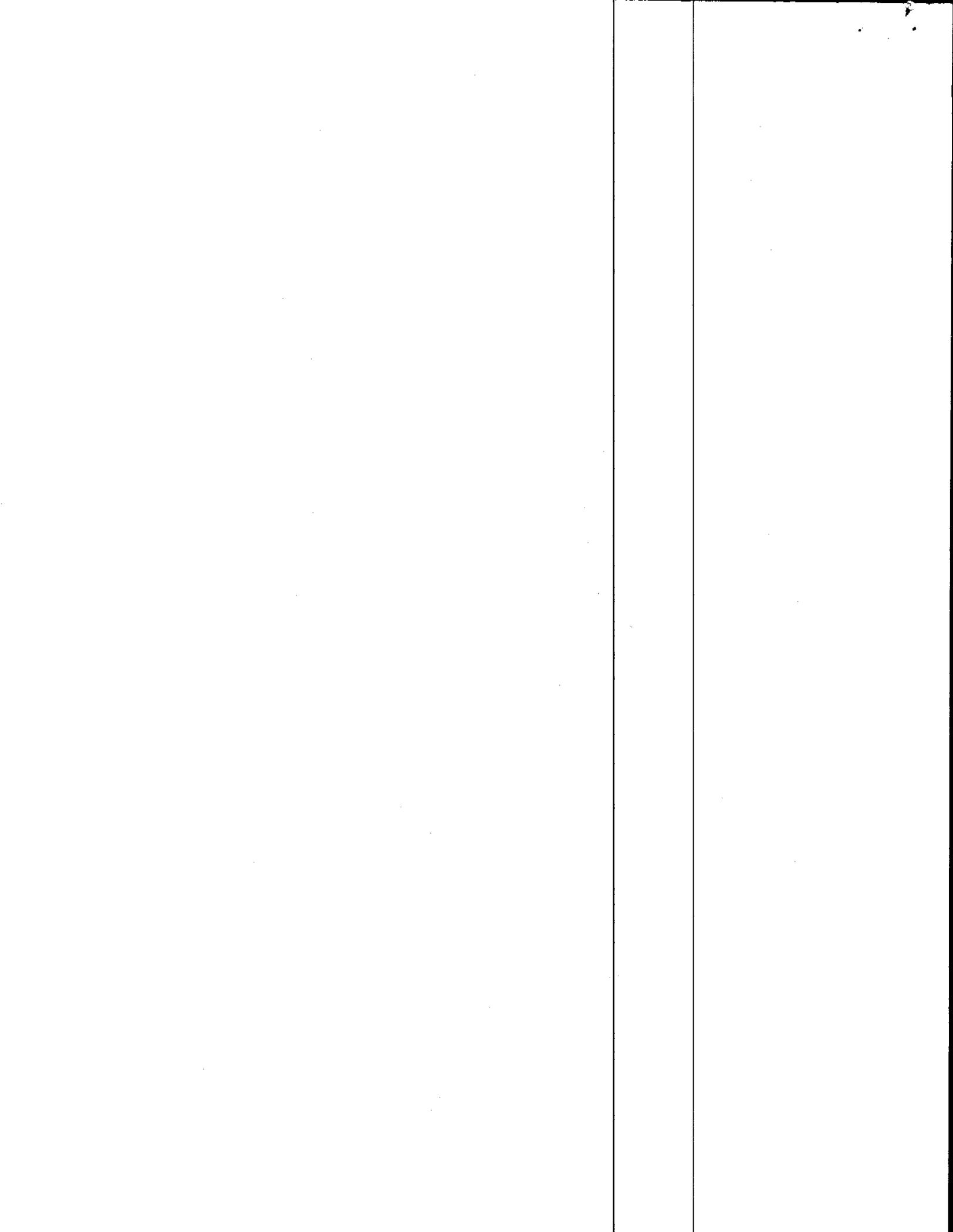


## **SEISMIC SURVEYS AND MPAs: HOW SHOULD MANAGERS ADDRESS THE ISSUE OF UNDERWATER NOISE?**

There has always been natural "noise" in the sea. Undersea volcanoes, for example, can produce extremely loud sounds - intense enough, hypothetically, to kill a man at close range (if the boiling water and lava did not get him first). The low-frequency vocalizations of some whale species are intense enough to travel 10,000 miles.

But over the past 150 years, the noise levels in our oceans have increased significantly. This is due to human activity. The propeller noise from shipping has raised the baseline for low-frequency ambient ocean sound worldwide. There is noise produced by undersea construction, such as pile-driving (e.g., hammering posts into the seafloor, such as for docks or drilling platforms). Sonar is used to map the ocean bottom or (for naval defense purposes) to scan for submarines. And airguns are used in seismic surveying: exploring the geologic substructure of the seafloor by sending sound energy into the ground and analyzing the returned energy.

What is the impact of this added noise on sea life? Because sound dissipates with distance, a loud sudden noise experienced by a fish or marine mammal will have a greater effect at close range than far away. The noise from pile-driving, for example, can be loud enough to stun fish nearby, but may have little (or less) effect on marine life several kilometers away. That said, marine mammals, because they are so dependent on sound to communicate, may be particularly sensitive. The effect of "masking", for example - when rising background noise interferes with the ability of individuals to hear or be heard - can block a range of signals among members of a species, such as signals to help identify mates, communicate the presence of food sources, or warn of the presence of predators.



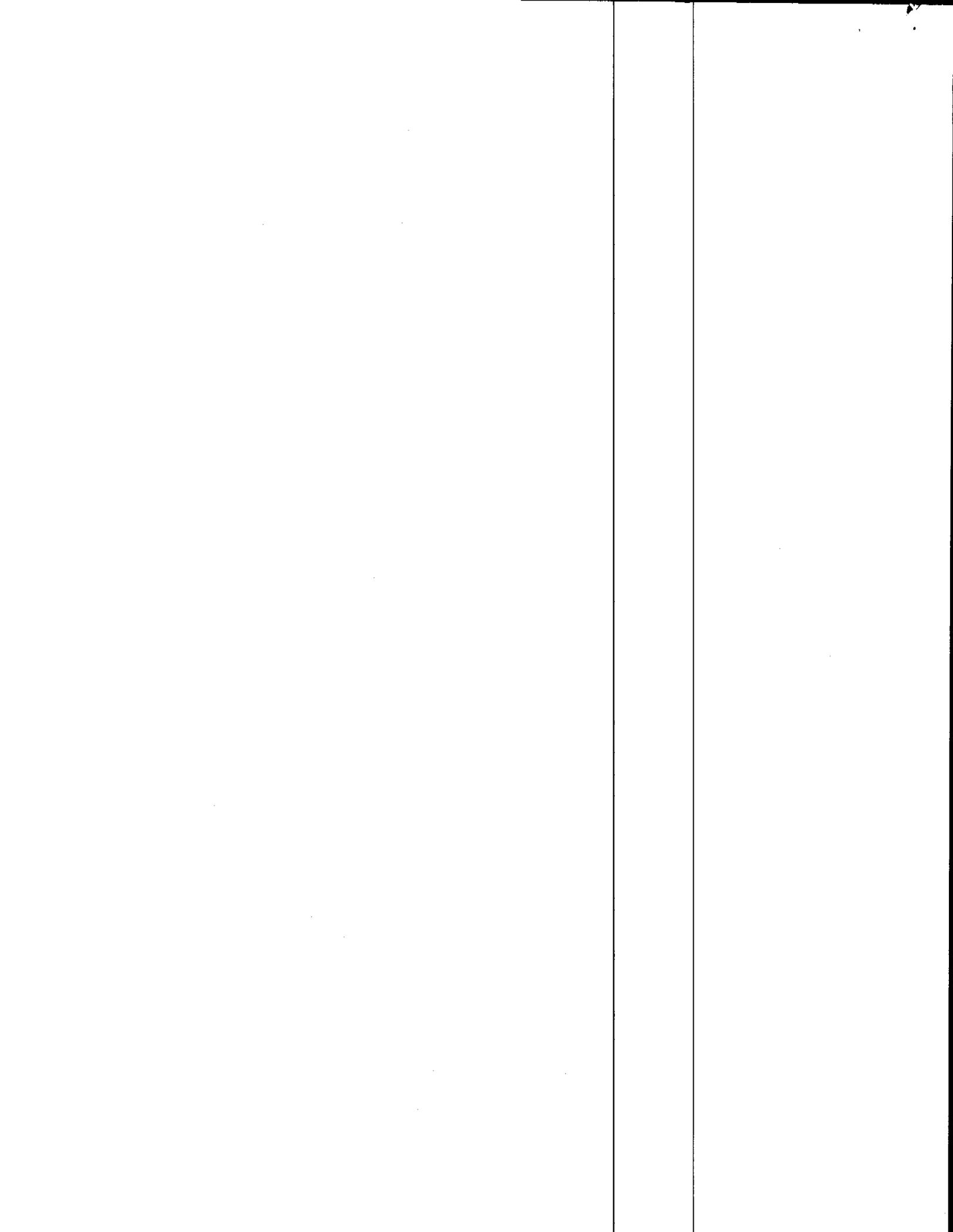
**This article focuses primarily on seismic surveying.** Because the offshore petroleum industry is actively seeking new sources of oil and gas, and conducts seismic surveying to explore for sub-sea hydrocarbon reserves, MPAs are increasingly encountering the possibility of such surveying inside their boundaries or in nearby waters. *MPA News* has received letters from MPA managers in recent years seeking advice on what intensity of seismic surveying can be considered safe for marine life. Here we describe a recent case that involved seismic surveying inside an MPA, and examine what managers in general can do to reduce the potential for negative impacts.

### **Impacts of sound**

In very broad terms, seismic surveying works under the same general principle as sonar or even echolocation (used by dolphins and whales to detect prey). An energy source sends pulses of sound outward, which then travel through the water column or the seafloor. Some of the sound waves refract (bend) or reflect off surfaces, and a receiver detects the returning sound. By noting patterns in the returned sound, it is possible to estimate properties of the surface(s) that reflected or refracted it - whether the surface is the seafloor, a subsurface oil deposit, a magma chamber beneath an undersea volcano, or a school of fish swimming around (in the case of dolphin echolocation).

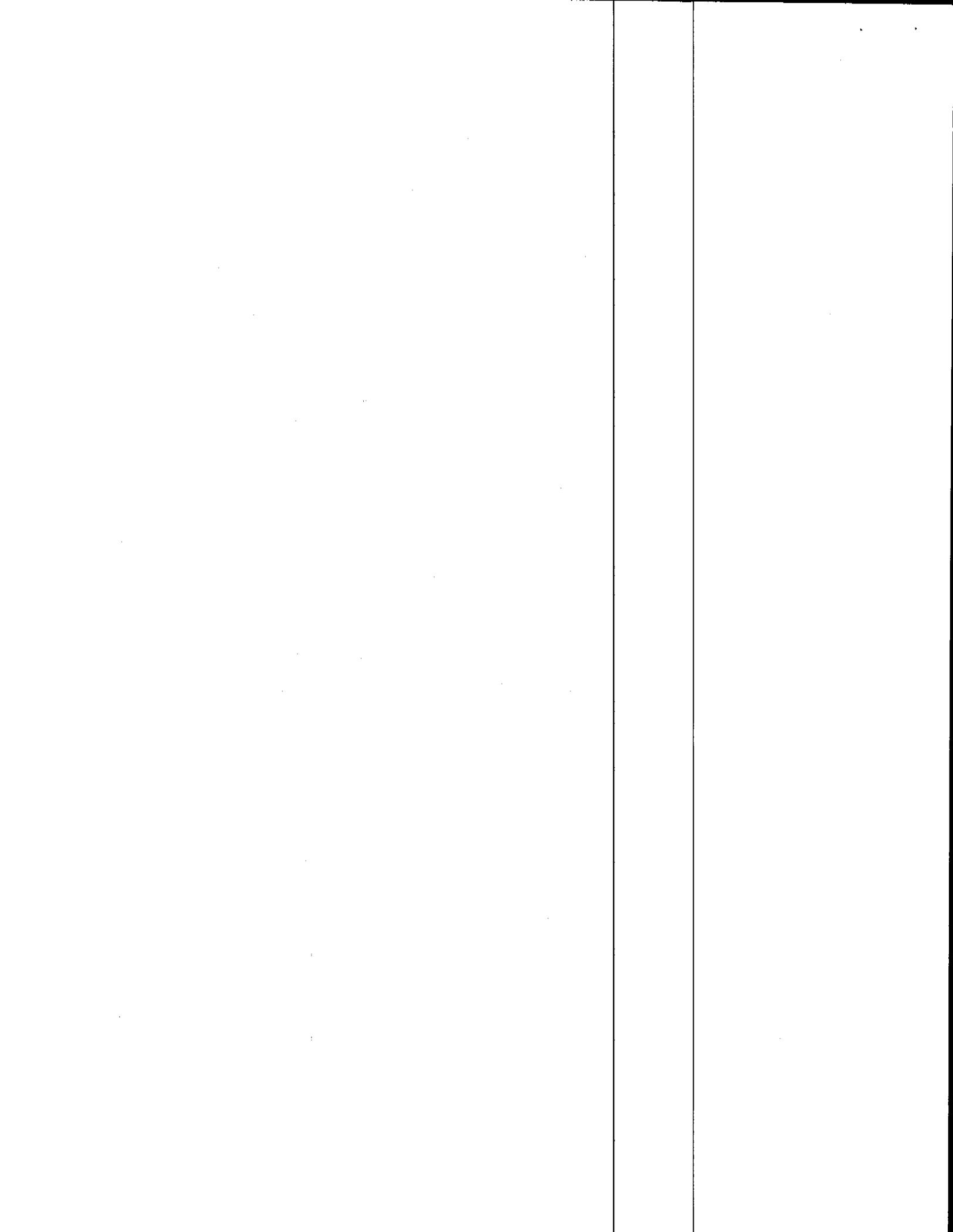
Aside from those similarities, however, there are some big differences. Seismic surveying, which uses a ship-towed array of multiple airguns as its sound source, relies mainly on low-frequency sound waves of 100 hertz or less. In contrast, the high-pitched "pings" produced during a multibeam sonar survey usually have peak levels in the tens to hundreds of kilohertz.

The difference in frequency plays a role in how each system affects the environment, says **Leila Hatch, marine ecologist at Stellwagen**



**Bank National Marine Sanctuary in the US.** Although all sound diminishes with distance, she says, low-frequency sounds diminish more slowly, meaning their impact can last over longer distances than those of high-frequency sounds. "Energy at low frequencies can travel great distances," says Hatch. "Thus, there can be a larger potential range of impact to organisms whose hearing is tuned to lower frequencies, or who use low frequencies to communicate, including many of the large baleen whales." Potential impacts of noise on sea life range according to the intensity of the sound. At lower intensities, or at greater distance from the sound source, organisms may simply exhibit avoidance behavior (although, with enough noise, they may also be impacted by masking of signals, as described earlier). At higher intensities, there can be temporary or permanent hearing loss. At ultra-high intensity, there can be organ hemorrhaging and death. In some cases, intense naval low-frequency active sonar (<1000 Hz) has been accused of playing a role in the stranding of marine mammals, particularly beaked whales. (See, for example, the 2006 *Journal of Cetacean Research and Management* article "Understanding the impacts of anthropogenic sound on beaked whales" at [www.saplonline.org/oceans/Noise/IONC/Docs/Coxetal\\_2006.pdf](http://www.saplonline.org/oceans/Noise/IONC/Docs/Coxetal_2006.pdf)).

**To manage such impacts,** some countries have established standards to govern the deployment of acoustic tools. The standards are based on received sound levels rather than the sound levels at source. **The US National Marine Fisheries Service, for instance, has set a standard that the received sound level for impulsive signals - such as those produced by airguns in seismic surveying - should be no more than 180 decibels (dB) for cetaceans and 190 dB for pinnipeds.** Above these levels, there is risk of permanent hearing damage and other physical injury, depending on the sensitivity of the species. To comply with these standards, seismic survey programs and multibeam sonar operations are required to take steps to reduce levels of exposure for marine mammals when



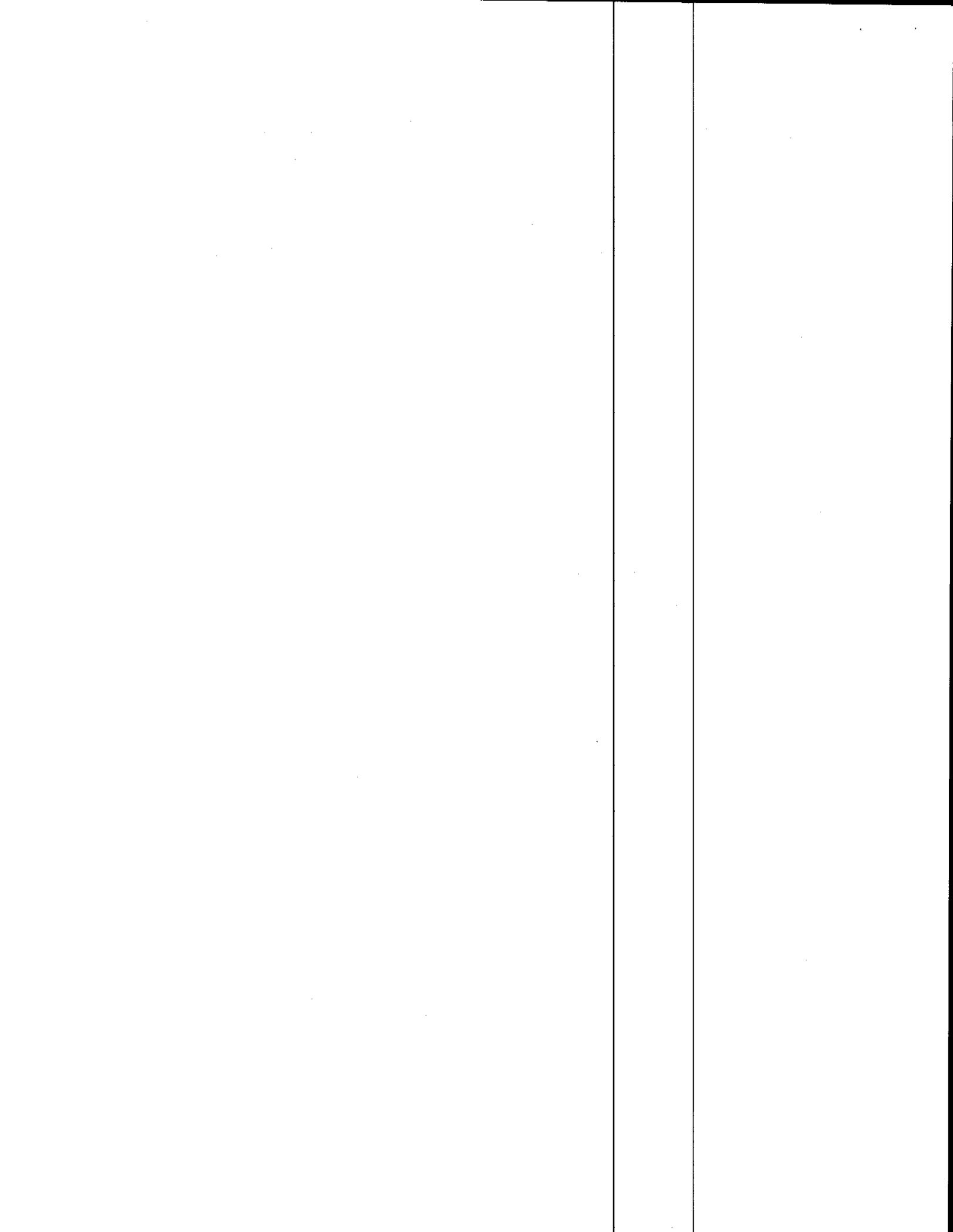
possible. When that is not possible, operators must ensure that the number of marine mammals exposed is small and impacts to overall populations is negligible (among other requirements). There are multiple mitigation and monitoring measures that can be taken to help ensure the standards are met - see the box "Strategies to reduce impact..." at the end of this article.

John Ford, a marine mammal biologist with Canada's Department of Fisheries and Oceans (DFO), says more research is needed to fine-tune the standards by the type of sound (e.g., low- or high-frequency) and the species to be protected. "These are recognized as crude standards," he says.

[Editor's note: For historical reasons, sound in water is referenced to a different intensity than sound in air. As a rough technique for converting sound levels from water to air, subtract 62 dB from the sound level in water: i.e., a 190-dB sound underwater would be approximately equivalent to 128 dB in air. See [www.fas.org/man/dod-101/sys/ship/acoustics.htm](http://www.fas.org/man/dod-101/sys/ship/acoustics.htm).]

### **The Endeavour case**

In 2008, a team of researchers from US universities informed the Canadian government of its interest in conducting a seismic survey inside the Endeavour Hydrothermal Vents Marine Protected Area, off the Pacific coast of Canada. The 93-km<sup>2</sup> MPA was designated in 2003 to protect fields of deep-sea hydrothermal vents and their associated biological communities on the seafloor. Although most marine seismic surveying is conducted to search for oil and gas, this survey would be different. The purpose was to study the structure and longevity of the volcanic heat source that drives hydrothermal activity at the site, as well as the plate tectonics of the region. Knowledge generated by the survey could benefit understanding and management of the MPA, and also provide

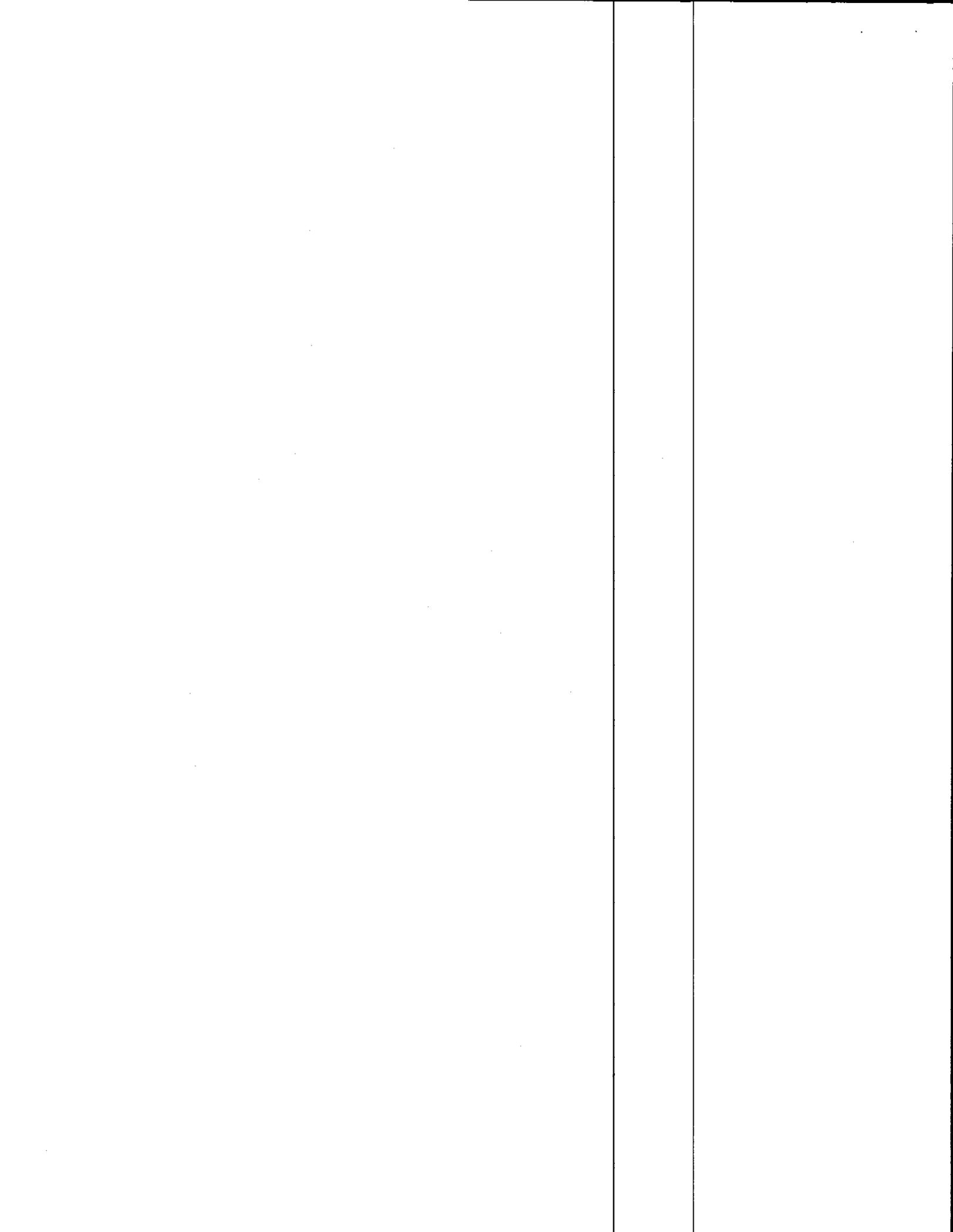


insights on volcanic and earthquake-related hazards to the Pacific Northwest region of the US and Canada.

In consultation with the Canadian government ahead of time, the research team agreed to mitigation measures that were more conservative than common Canadian practice to that point. The scientists expanded the marine mammal safety zone around the ship to a radius of 1220 meters, at which distance the received sound level would be 180 dB. (If a whale were spotted within the safety zone, the array would be powered down until the whale left the zone.) Also, a pre-startup watch period was expanded from 30 minutes to 60 minutes as a safeguard against any deep-diving whales' being in the safety zone.

In August 2009, a week before the expedition was to start, two Canadian conservation NGOs filed a lawsuit against the government to disallow the study. The lawsuit argued that noise from the surveying would harm marine mammals at the site (blue whales and fin whales sometimes live in the area) and thus did not comply with Canadian law to protect endangered species. They also argued that MPAs, in particular, deserved to be governed under the precautionary principle: that any possibility of harm to the ecosystem should be avoided when possible. This was not the first MPA to encounter this argument. In 2003, the government of the Australian state of Victoria refused an application for seismic surveying inside the Twelve Apostles Marine National Park. The Victorian environment minister said at the time, "A higher environmental test applies to national parks and we have adopted a precautionary approach in this case."

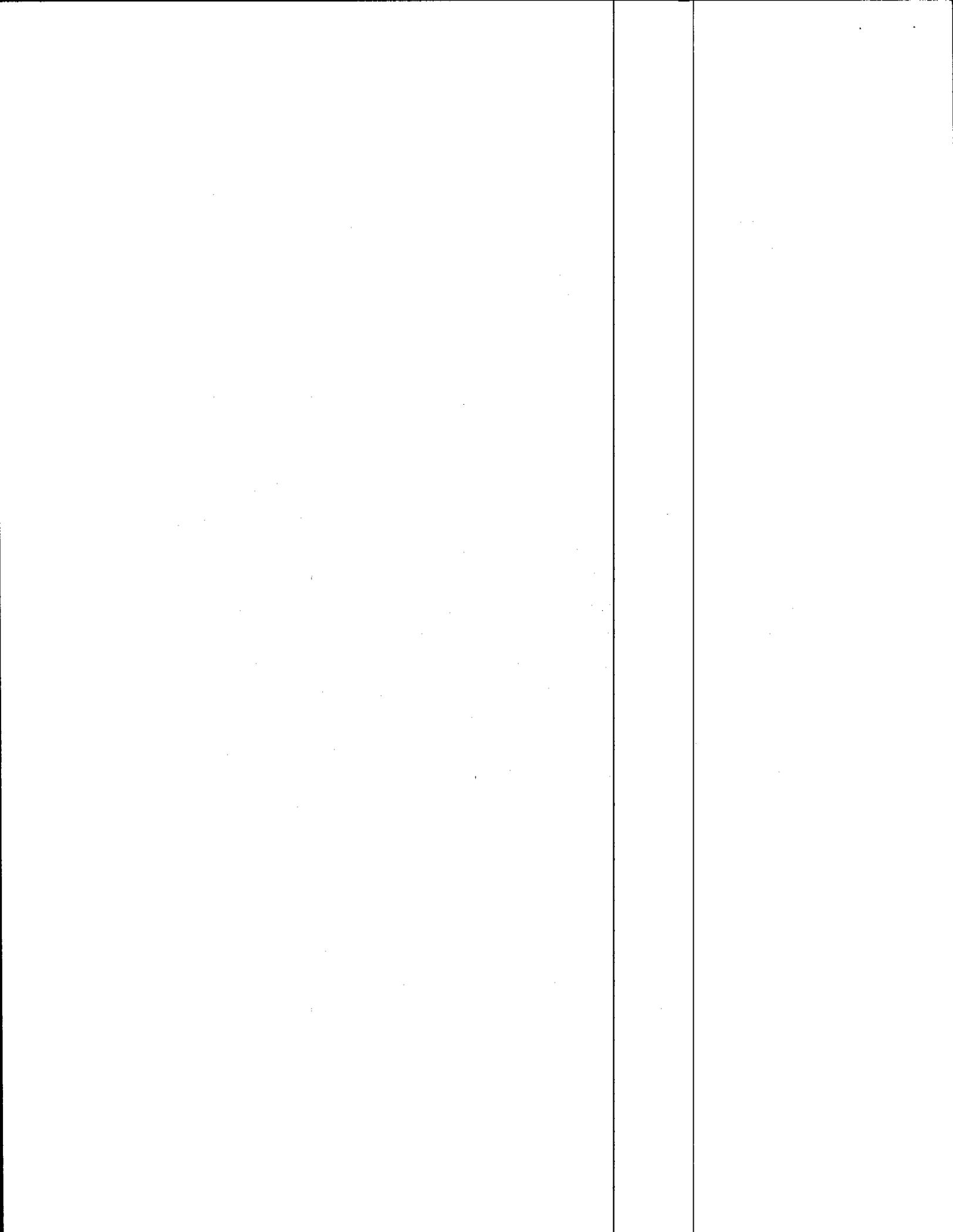
In response to the Endeavour lawsuit, DFO's Ford proposed that the radius of the safety zone around the vessel be expanded to 7 km: the goal would be to reduce received sound to a maximum of 160 dB outside the zone. (A threshold of 160 dB is believed by some marine



mammal researchers to be the point above which behavioral disturbance can occur.) The research team consented to Ford's recommended change, and increased its number of marine mammal observers in order to monitor the larger radius. Ultimately, a Canadian court ruled that the environmental NGOs had failed to prove that the survey would cause "irreparable harm"; therefore, the court could not halt the survey. The expedition proceeded in September. (Notably, a marine seismic survey that was proposed in 2007 for the fjords of northwest British Columbia, Canada, was disallowed by the government in part because an adequately large safety zone was not possible in such confined waters, says Ford.)

William Wilcock, a marine geophysicist at the University of Washington in the US, served as co-investigator on the Endeavour survey expedition. He says the threat to marine mammals was negligible, as blue and fin whales would not typically be in the Endeavour region during the time of year of the survey. In an essay written with his Endeavour co-investigators (Doug Toomey and Emilie Hooft), Wilcock said, "During the 16 days of seismic data collection, no whales were observed by the marine mammal observers. But had they been, the mitigation measures that were in place before the legal action would have been more than sufficient to ensure that they were not harmed." (The essay is available at [http://gore.ocean.washington.edu/research/etomo\\_environmentalists\\_091809.pdf](http://gore.ocean.washington.edu/research/etomo_environmentalists_091809.pdf).)

Wilcock believes the legal challenge by environmentalists was part of a strategy by them to prohibit any seismic surveying off the Pacific coast of Canada, for fear that it might open the door to oil and gas surveys in the region. There is currently no hydrocarbon exploration off Canada's Pacific coast, in contrast to the country's Arctic and Atlantic waters where exploration has been permitted. Wilcock says the fact the government required stricter mitigation for the Endeavour survey could lead to later legal



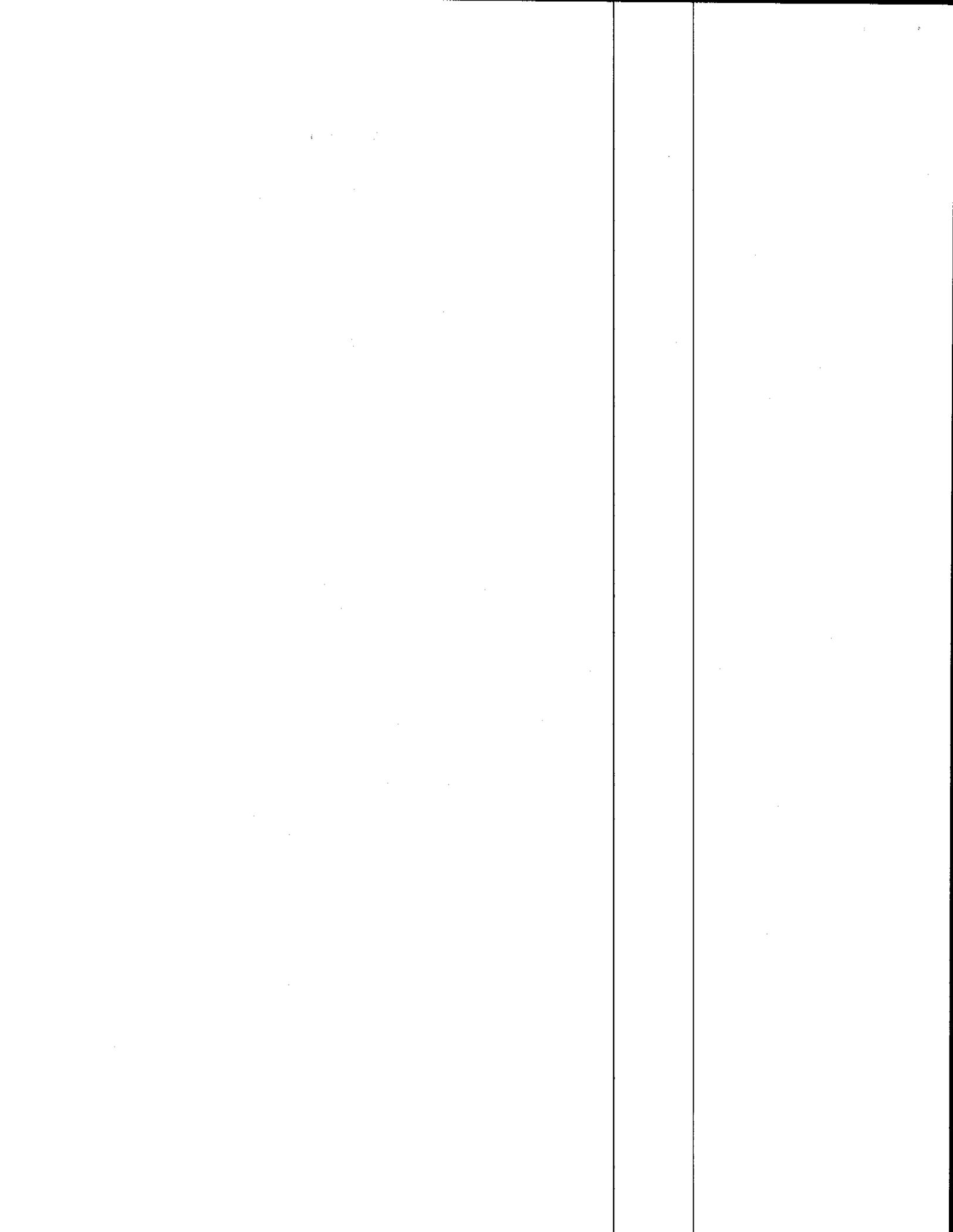
problems for the government. "In future court actions, how will the government explain the discrepancy between the mitigation measures required for the Endeavour study and the less onerous ones used elsewhere in regions where marine mammal encounters are much more likely?" he asks.

Sabine Jessen of the Canadian Parks and Wilderness Society (CPAWS) - which, along with the Living Oceans Society, had filed suit to stop the Endeavour survey - is disappointed the study was allowed to proceed, but is pleased that safety was improved. "We hope our challenge resulted in improved monitoring of marine mammals," says Jessen. "CPAWS' motivation was to protect the Endeavour Vents MPA, and other Marine Protected Areas in Canada, from harmful disturbances that we believe to be illegal."

She says scientists need to take responsibility for ensuring they use the best available technology to minimize risks to the natural environment. Moreover, she says, it is government's responsibility to apply the precautionary approach. "Government must ensure that potentially harmful scientific experiments are not permitted on the basis of a lack of full scientific certainty of the likelihood or magnitude of harmful impacts," she says. She adds this is particularly the case for MPAs. "Acoustic disturbance of MPAs should be limited to the greatest degree possible." She suggests MPAs should be managed to provide "acoustic comfort" to their resident species.

### **Advice for managers**

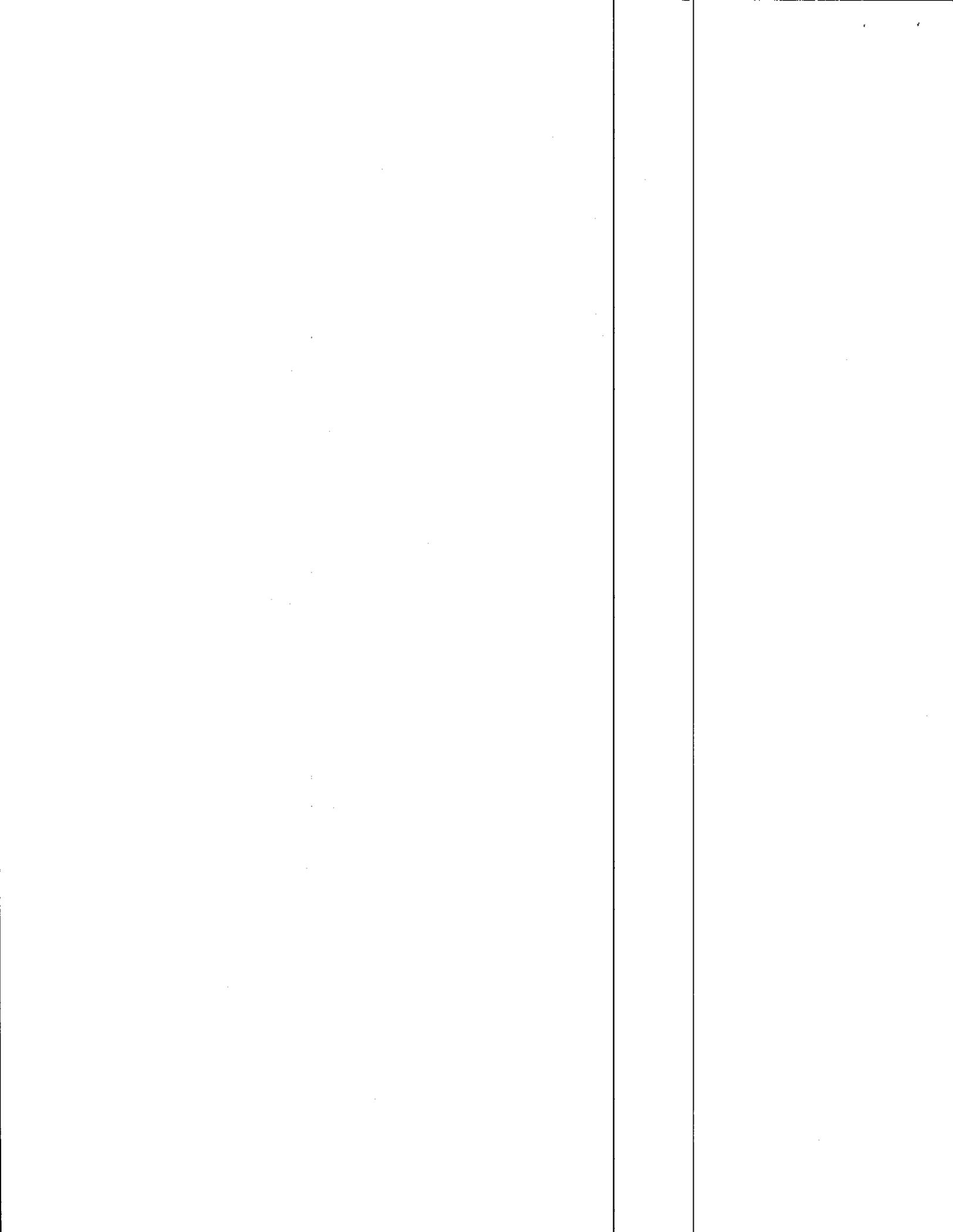
Wilcock and his co-investigators say there have been no clear cases yet where seismic experiments have injured or killed marine mammals. "Provided that seismic experiments are performed with sensible mitigation measures (e.g., marine mammal observers; ramping up the sound source over time), the only impact on marine



mammals is that some avoid the sound source," they wrote in their Endeavour essay. However, if the time and place of a seismic experiment coincide with an important marine mammal feeding or birthing ground, they add, it would be advisable to change the season or location of the experiment. If such changes are not possible, they say, "then the [resource] managers must make a difficult determination of whether the societal benefits of the research at a particular site outweigh the impacts on the environment." (Wilcock, Toomey, and Hooft emphasize the benefits of their Endeavour research and point out that commercial ships regularly pass through the MPA there producing significant propeller noise and the threat of whale strikes.)

DFO's Ford considers a maximum of 160 dB for received sound to be "the best standard we have" for guarding against negative impacts to cetaceans, notwithstanding the uncertainties involved in gauging marine mammal sensitivity. He adds, however, that the range at which that level is reached - and hence the size of the safety zone - can vary with the type of survey, depth, and other factors. Therefore a preset safety zone at an arbitrary distance may be overly large for some surveys, and not large enough for others.

Hatch of the Stellwagen Bank National Marine Sanctuary says MPA managers should educate themselves on current governmental guidelines for safe practices. "The best tools for reducing risk of injury are to produce less sound within frequencies that affect marine mammal hearing and communication, and to operate outside time periods and areas where marine mammals are present," says Hatch. "The MPA manager should engage the surveyor in dialogue on how best to reduce or eliminate impacts. That includes providing information to the survey team on the distribution, densities, and behavior of species in the MPA that could be impacted. In areas where such information is lacking, best practice would dictate gathering baseline data prior to conducting seismic surveys there."



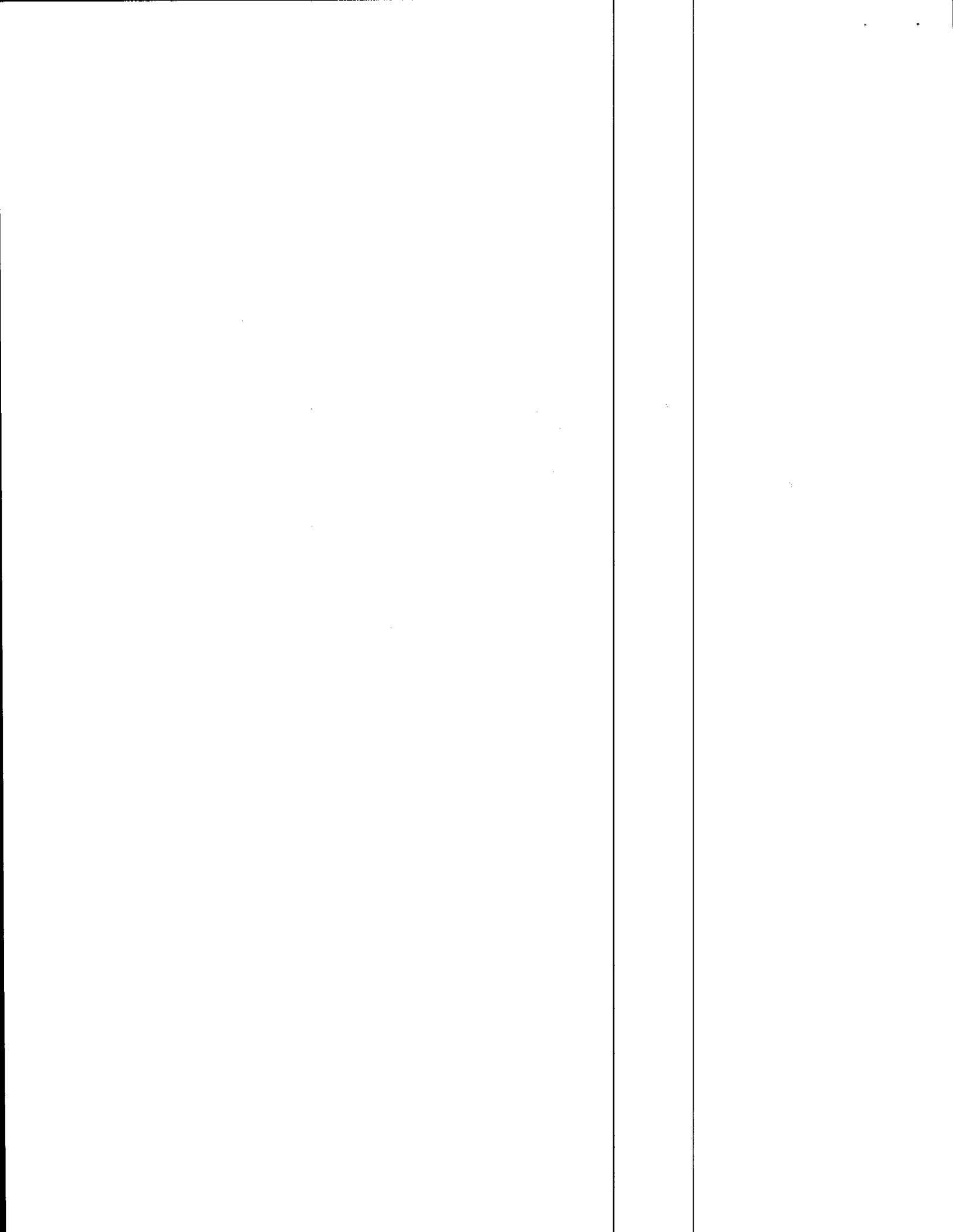
**For more information:**

**Leila Hatch**, Stellwagen Bank National Marine Sanctuary, Scituate, Massachusetts, US. E-mail: [leila.hatch@noaa.gov](mailto:leila.hatch@noaa.gov)

**John Ford**, Pacific Biological Station, Department of Fisheries and Oceans, Nanaimo, British Columbia, US. E-mail: [John.K.Ford@dfo-mpo.gc.ca](mailto:John.K.Ford@dfo-mpo.gc.ca)

**William Wilcock**, School of Oceanography, University of Washington, Seattle, Washington, US. E-mail: [wilcock@u.washington.edu](mailto:wilcock@u.washington.edu)

**Sabine Jessen**, CPAWS-BC, Vancouver, British Columbia, Canada. E-mail: [sabine@cpawsbc.org](mailto:sabine@cpawsbc.org)



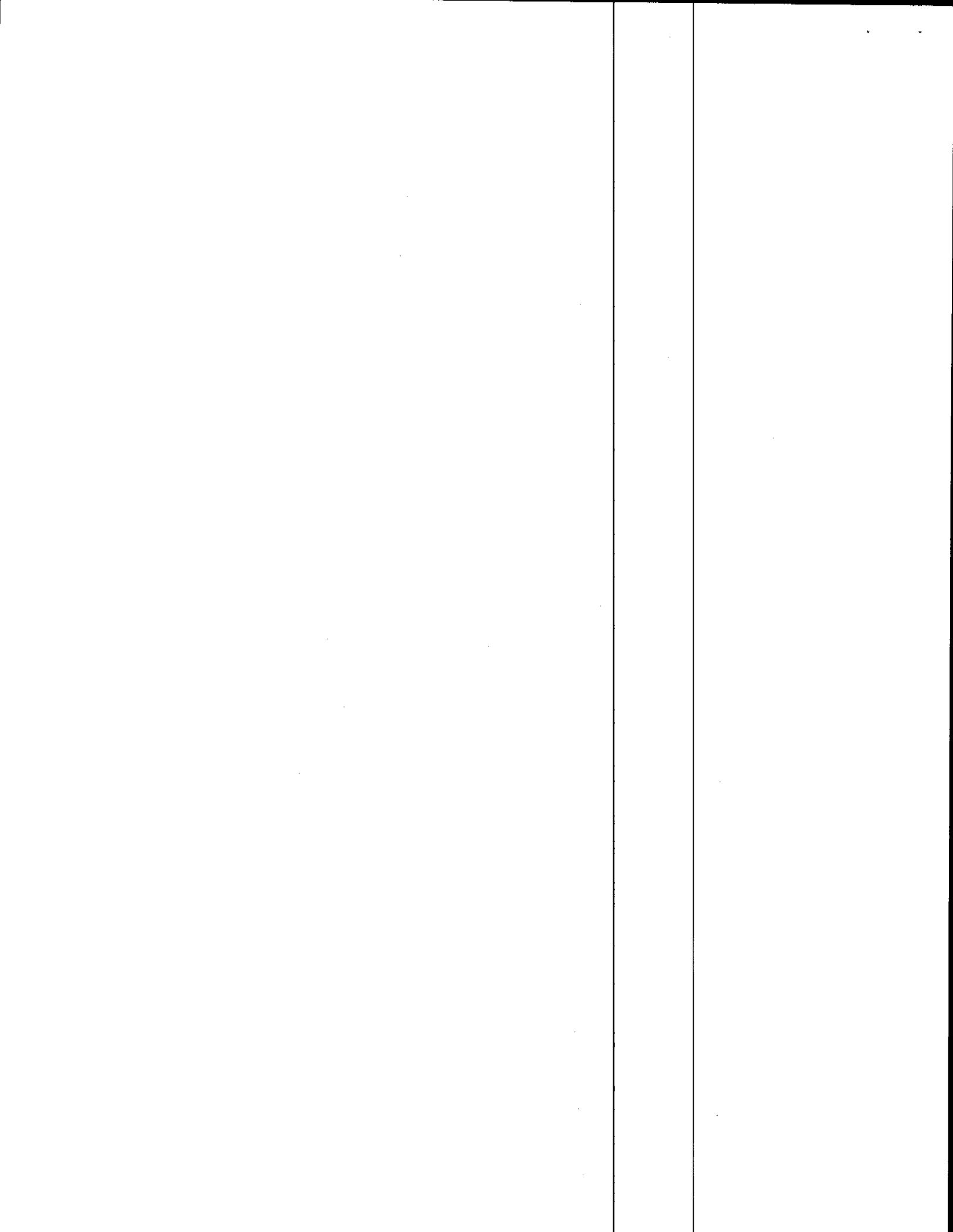
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## **BOX: Strategies to reduce impact of seismic surveying on marine mammals**

- **Avoid surveying in areas with sensitive species:** gather data on how animals use an area prior to conducting seismic surveys there
- **Safety zone around the survey:** make this zone large enough to ensure that received sound levels outside of it are below maximum limit
- **Pre-shoot watch:** look for marine mammals inside the safety zone prior to start-up of the airgun source
- **Visual observers:** look for marine mammals inside the safety zone during the survey, and power-down the seismic activity if marine mammals are sighted
- **Passive acoustic monitoring:** listen for vocalizing marine mammals
- **Soft-start or ramp-up:** gradually build up the airgun sound level to allow marine mammals to depart the area before sound levels peak
- **Minimize airgun sound propagation:** use the lowest practicable volume throughout the survey
- **Restrict airgun use during nighttime hours:** conduct surveys only when there is sufficient light for marine mammal observations

Source: Adapted by MPA News from Weir et al., "Marine mammal mitigation during seismic surveys and recommendations for worldwide standard mitigation guidance". Published by the Whale and Dolphin Conservation Society, UK. [www.ketosecology.co.uk/MitigationSC58E12Final.pdf](http://www.ketosecology.co.uk/MitigationSC58E12Final.pdf)

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**BOX: Additional publications on underwater noise** • Overview of the impacts of anthropogenic underwater sound in the marine environment (OSPAR).

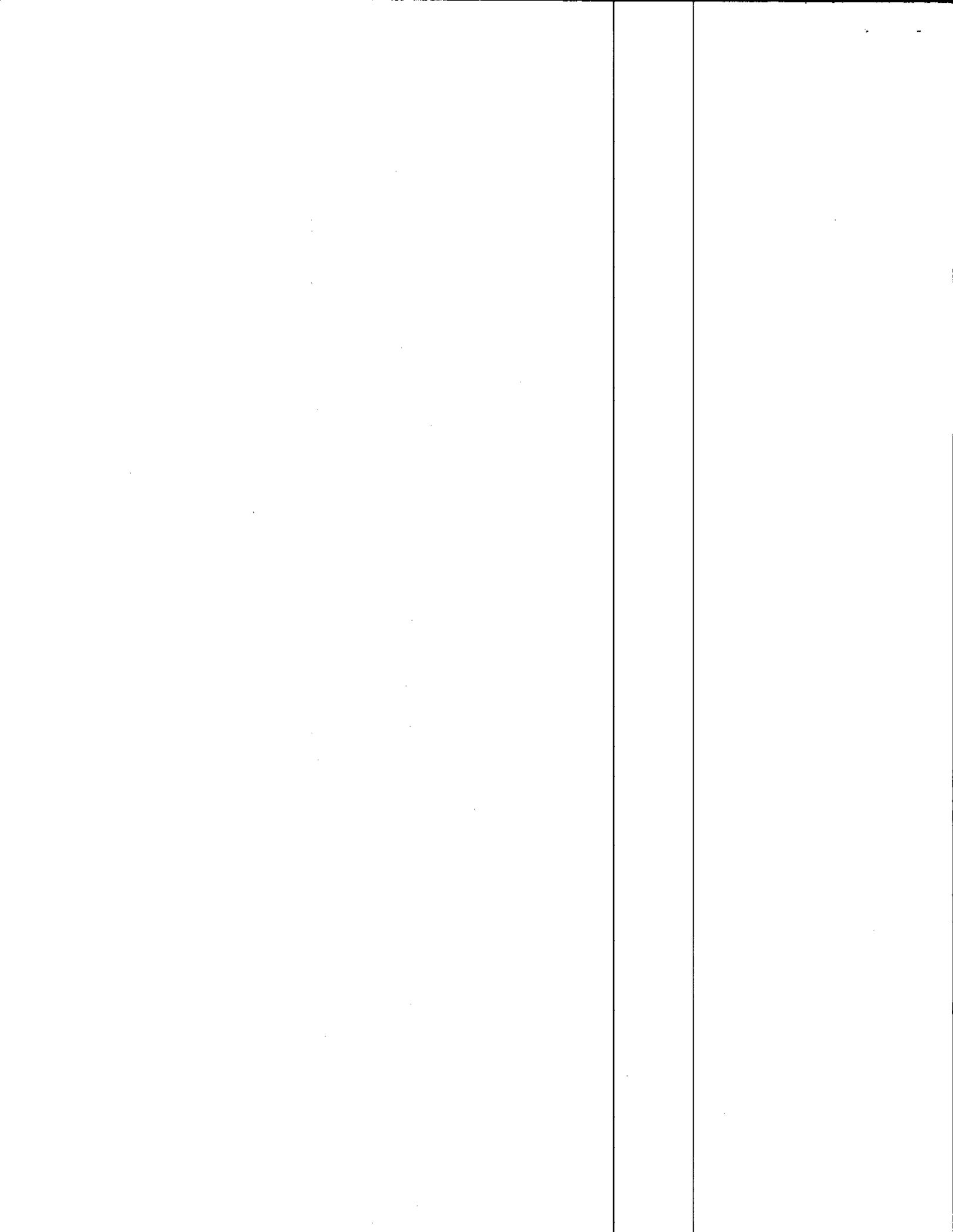
[www.ospar.org/documents/dbase/publications/p00441\\_Noise%20Background%20document.pdf](http://www.ospar.org/documents/dbase/publications/p00441_Noise%20Background%20document.pdf)

• Maritime traffic effects on biodiversity in the Mediterranean Sea, volume 1: Review of impacts, priority areas and mitigation measures (2009, IUCN)  
<http://data.iucn.org/dbtw-wpd/edocs/2008-042-1.pdf>

• "The impacts of anthropogenic ocean noise on cetaceans and implications for management" (2007, Canadian Journal of Zoology).

[http://article.pubs.nrc-cnrc.gc.ca/ppv/RPViewDoc?\\_handler\\_=HandleInitialGet&journal=cjz&volume=85&calyLang=eng&articleFile=z07-101.pdf](http://article.pubs.nrc-cnrc.gc.ca/ppv/RPViewDoc?_handler_=HandleInitialGet&journal=cjz&volume=85&calyLang=eng&articleFile=z07-101.pdf)

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**Who are the Victims of PG&E's Seismic Testing?**

What is more important to you; the health of the local oceanic ecosystem or the relicensing of Diablo Canyon Nuclear power plant? This is the real question underlying the debate over PG&E's proposed seismic testing.

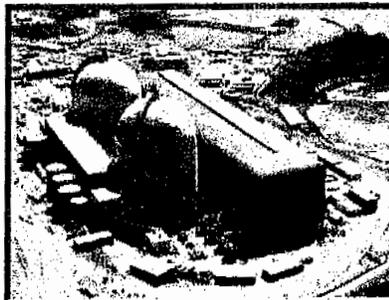
Our local ocean provides us with an abundance of fresh food, fresh air, a well regulated and comfortable climate, a place of beauty, an attraction to tourists, as well as a viable means to make a living for commercial fishing operations. Additionally, it is the home to a myriad of marine life from phyto-plankton to humpback and gray whales. Diablo Canyon Nuclear Power Plant, on the other hand, provides a mere 8% of California's power on a good day. We can mitigate the loss of 8% of our power through simple conservation and alternative energy sources such as solar power. We cannot mitigate for the damages done by the proposed seismic tests, or a nuclear disaster for that matter.

The purpose of proposed seismic testing is to add to the existing information regarding the fault lines upon which Diablo Canyon sits. It is known that the fault lines exist and pose grave danger to the power plant and thusly all inhabitants of the county. What is unknown is how critically the marine life will be impacted by the proposed seismic tests.

The "significant and unavoidable" impacts listed in the EIR of the study include impacts to air quality, marine biological resources, green house gasses, and land use and recreation. The testing involves the use of air guns carpet-bombing the ocean floor with 260 db of ear-shattering sonic blasts which can lead to serious injury and death among marine mammals and threatens the food sources and



Breaching Humpback



Diablo Canyon Nuclear Power Plant

habitat of all marine life. The EIR identifies fin, humpback, and blue whales as well as harbor porpoise and sea otters at risk of death and injury. "Autopsies of marine animals suspected of being killed or injured by sonar have revealed holes in organs and bleeding around the brains and ears." Sonar is routinely used by the Navy as well as the oil industry, and its use is associated with injury, death, and beaching of marine mammals.

Assuming that the technicians can thoroughly scan and/or clear an area for marine mammals before using the sonar is unrealistic, and this mitigation does nothing to prevent harm to marine life that does not move away from the noise. Additionally, the effects of this level of noise disruption on more stationary marine life such as mollusks, small fish, microorganisms, and sea vegetation is largely unknown. The end effect of these studies has been shown to be economically damaging to local commercial fisherman, and could negatively affect visitor serving businesses along the coast from Nipomo to Cambria. The EIR acknowledges "serious and unavoidable" impacts meaning *real* impacts are most likely broader and longer lasting than the EIR acknowledges.

This issue is uniting non-profit organizations, business people, and citizens alike, as few issues can. You can help by signing the petition to the California Coastal Commission to ban seismic testing at: <http://www.change.org/petitions/california-state-land-commission-halt-the-central-coastal-california-seismic-imaging-project> Both the Draft and Final EIRs, may be viewed electronically, at [www.slc.ca.gov](http://www.slc.ca.gov) (under the "Information" tab and "CEQA Updates" link).

BY MATT FOUNTAIN

# Given 'take'?

*Reports on marine take, survey vessel raise questions in PG&E seismic imaging project*

**M**uch has been said about Pacific Gas & Electric's plan to conduct high-energy, three-dimensional seismic studies off the Central Coast that ratepayers will pay some \$64 million for.

Opponents have vilified the project as harmful to the environment, marine life, and local economy. PG&E reps, on the other hand, assure that they're doing everything in their power to minimize those effects, which they say aren't as bad as some stakeholders have made them out to be. And, PG&E argues, the studies will contribute to the overall safety of every person in the vicinity of Diablo Canyon nuclear power plant.

However, a draft environmental assessment submitted to the National Science Foundation (NSF) by Goleta-based consultant group Padre Associates, Inc. on behalf of PG&E exposes a perplexing list of marine wildlife expected to be "harassed" in some fashion by the project.

That list has raised some alarms.

According to the assessment, the surveys will result in a substantial "take" of local marine life. But this isn't the kind of take you would expect in commercial fishing. Instead, the report lists harm to marine life as "take by harassment"—the definition of which is about as elusive as the ghost of a wet bar of soap.

12-gauge shotgun blast is approximately 165 decibels.

The report has yet to be certified by the National Science Foundation, which is expected to happen in October, according to NSF Spokesperson Maria Zacharias.

The report lists an alarming number of marine mammals that will be harassed. Some highlights: PG&E is requesting to "take" 78 California gray whales, 11 humpback whales, 12 blue whales, 1,468 short-beaked dolphins, 66 long-beaked common dolphins, 152 Pacific white-sided dolphins, 91 Northern right whale dolphins, 1,321 bottlenose dolphins, 849 California sea lions, 1,188 Southern sea otters, and 3,736 Morro Bay harbor porpoises, among others.

PG&E Spokesman Blair Jones told *New Times* those figures are a liberal assessment of how many animals will in some way be moderately affected by the air blasts. Jones reiterated that the utility is taking every measure possible to avoid harming wildlife and will have independent observers aboard the vessel to scan the area for wildlife.

Jones clarified that the Incidental Harassment Authorization permit it has applied for only allows for Level B—or the lowest level of harassment that only results in behavioral reactions—take, and that if even one marine mammal is

resources and marine habitats," the Aug. 10 letter reads.

A NOAA spokesperson didn't respond to an inquiry on whether the NSF has replied, as of press time.

Little is known about this type of testing's long-term effects on marine mammals' populations, but an alarming case in Peru in Spring 2012 has led to speculation. According to national news reports, approximately 900 dead bottlenose dolphins washed ashore following similar testing.

The project entails blasting air guns, fixed to the back of a research vessel, into the water. The blasts are reflected off the sea floor and picked up and recorded by an array of panels. The vessel, the *Marcus Langseth*, a joint academic-commercial ship owned by the National Science Foundation and to be contracted out to PG&E, will follow a grid-like formation over an area of 530 square-nautical miles from Guadalupe to Cambria in an effort to provide the best map, if you will, of just what the Earth's crust looks like—and what kind of earthquake it's capable of producing—around Diablo Canyon.

It's the same type of testing used to explore for offshore oil deposits.

According to the NSF's Zacharias, the foundation has yet to solidify its contract with PG&E.

and environmental problems in the past, and questions over whether it is fitted with the most up-to-date equipment have come up.

The 2008 minutes of a *Marcus Langseth* Oversight Committee meeting features a laundry list of various mechanical improvements it needs to get in "working condition."

According to minutes from 2010, the *Langseth's* operator reported marine mammals and smaller fishing vessels "snagging" the towed arrays during a 2009 cruise. In a separate cruise that year, the *Langseth* was forced to de-obligate a \$1.3 million contract when a software-related problem caused an issue with the ship's multibeam following a supposed upgrade.

In July 2011, the ship's committee reported buying a new steamer and other equipment from Western Geco—a company Gibson had urged considering for the survey—worth a reported \$5 million to \$6 million, according to the report. The used equipment was purchased for a mere \$400,000.

"This is helping to bring the gear to more modern standards," the report reads.

According to a December 2011 report approximately \$8 million has been spent on upgrading the *Langseth* since

An NSF spokesperson referred *New Times* inquiries about the report to PG&E. The main consultant for Padre Associates didn't return repeated requests for comment.

Nobody seems to be able to explain exactly what "take by harassment" means or what the result in long-term effects for local fisheries and marine mammal populations. However, as best as *New Times* can ascertain, "take by harassment" can range anywhere from making a sea lion flinch to blowing its brains out with the air blasts that the assessment says are capable of reaching up to approximately 250 decibels.

To put that figure in contrast, a

harmful, operations would be halted.

Operations would then be reviewed by the National Marine fisheries Service, he said.

But the numbers—and apparently other data in the assessment—led the National Oceanic and Atmospheric Administration (NOAA) to send a letter to PG&E encouraging further National Environmental Protection Act review before certifying the report.

"We believe this project and our regulatory review would benefit from a more thorough NEPA analysis and we want to work closely with NSF to help improve the EA to better address potential impacts to living marine

However, both State Sen. Sam Blakeslee (R-San Luis Obispo)—whose legislation mandated the studies—and county supervisor Bruce Gibson—who sits on the project's Independent Peer Review Panel to oversee its operation—have been outspoken over their concerns about the *Langseth* not being "up to industry standards."

The vessel came into service in 2008, but has only been operating in its current joint role as an academic-commercial seismic vessel for a little more than a year, following several years of dry-dock and various improvement upgrades. According to records of its stakeholder committee, it's encountered mechanical

2008.

Others have pointed out that the boat is owned by the NSF, which is currently one of the agencies from which PG&E is awaiting approval.

A Federal Register notice detailing PG&E's requested take was posted Sept. 19. Public comments will be accepted until Oct. 15.

Given approval by the California Coastal Commission—expected in mid-October—and the California Fish and Game Commission, surveys are expected to commence in November. A

Staff Writer Matt Fountain can be reached at [mfountain@newtimeslo.com](mailto:mfountain@newtimeslo.com).



**ALLIANCE FOR NUCLEAR RESPONSIBILITY**

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June 4, 2012

Jennifer DeLeon, Project Manager  
California State Lands Commission  
100 Howe Avenue, Suite 100-South  
Sacramento, CA 95825

Dear Ms. DeLeon:

I write to update you on the latest developments from PG&E's Reply Brief filed June 1, 2012 in the CPUC's A.10-01-014 proceeding. Consistent with the witness stand testimony of Dr. Stuart Nishenko cited in A4NR's May 3, 2012 written comments on the DEIR, the utility appears to have agreed that its seismic studies should cover the onshore and offshore terrain recommended by Dr. Douglas Hamilton.

- *A4NR revises its original recommendation concerning the scope of the seismic studies, narrowing it to request only that the Commission direct PG&E to configure its onshore and offshore seismic studies to specifically address the postulated onshore and offshore faults raised in A4NR witness Douglas Hamilton's testimony ... Accordingly, the Commission need not take any action other than approving PG&E's application, as filed, in order to implement A4NR's revised recommendation.<sup>1</sup> (emphasis added)*
- *As noted above, it is not necessary for the Commission to take any action other than approval of PG&E's application, as proposed, to ensure that PG&E's seismic studies are designed to collect data that will address the postulated faults raised in Dr. Hamilton's testimony.*<sup>2</sup> (emphasis added)

To remove any uncertainty as to what this will entail, I am attaching the same maps that were the Appendix to A4NR's Opening Brief in A.10-01-014 (to which PG&E's Reply Brief was responding) and which were cited in A4NR's May 3, 2012 written comments on the DEIR. They are taken from geologist Erik Layman's written comments on the DEIR, which cross-referenced Dr. Hamilton's A.10-01-014 testimony.

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<sup>1</sup> PG&E Reply Brief, pp. 2-3.

<sup>2</sup> *Ibid.*, pp. 4-5.

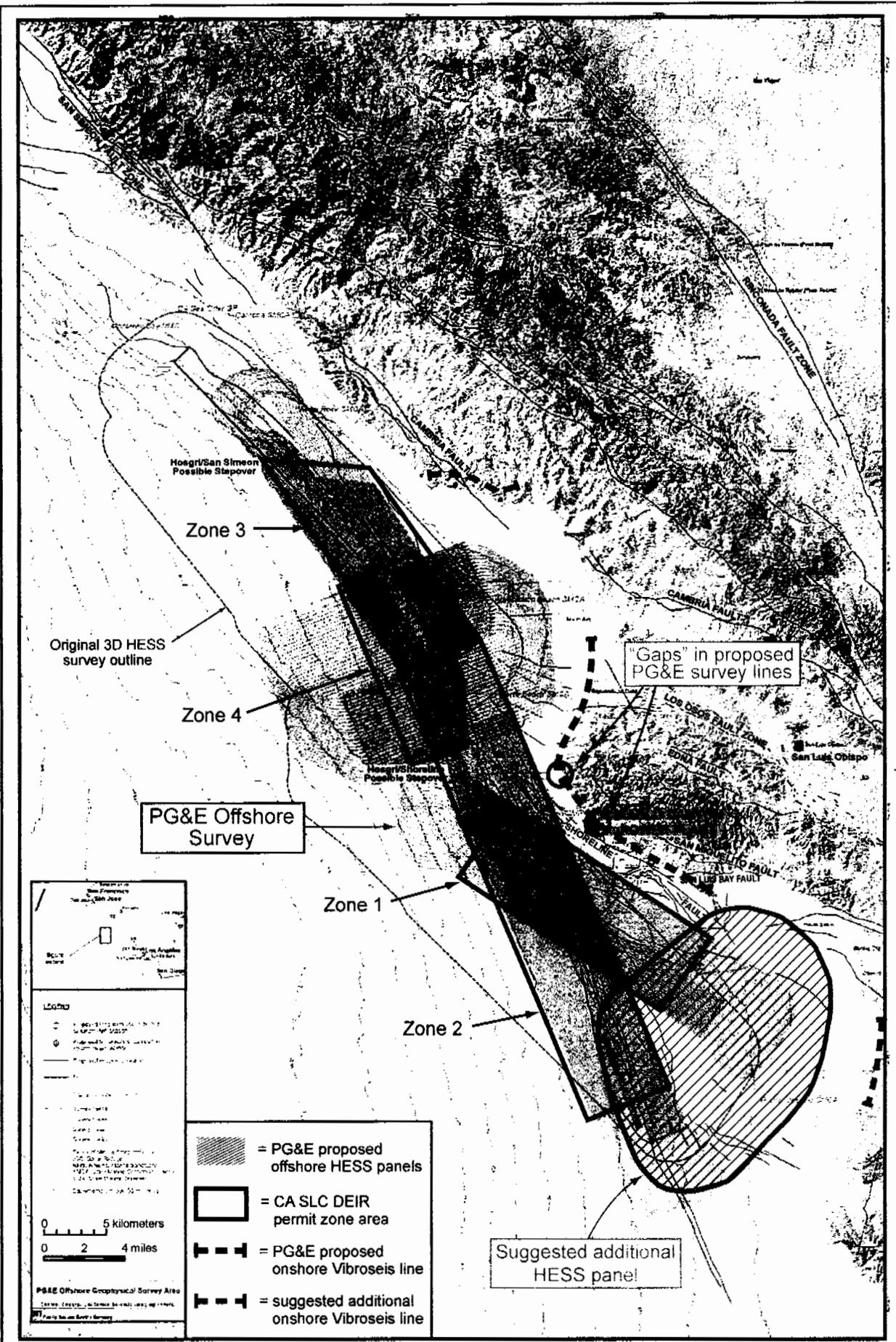
Rather than simply rely on PG&E's assurances, A4NR continues to believe that better regulatory practice at both the CPUC and the State Lands Commission is to provide clear direction. Accordingly, I repeat the first recommendation from our May 3, 2012 DEIR comments:

**A4NR respectfully asks the State Lands Commission to require PG&E to specifically delineate the changes in its offshore and onshore study plans necessary to gather data to fully assess the "missed fault" recommendations of Dr. Douglas Hamilton, as graphically mapped in the DEIR comment submitted by geologist Erik Layman.**

Sincerely

/s/

Rochelle Becker  
Executive Director



**Figure 1.** Alternative 3D Marine HESS Racetrack, plan submitted to CA SLC by PG&E January 2012, with suggested revised 3D Marine HESS Racetrack panels and on-land 2D Vibroseis lines plotted.

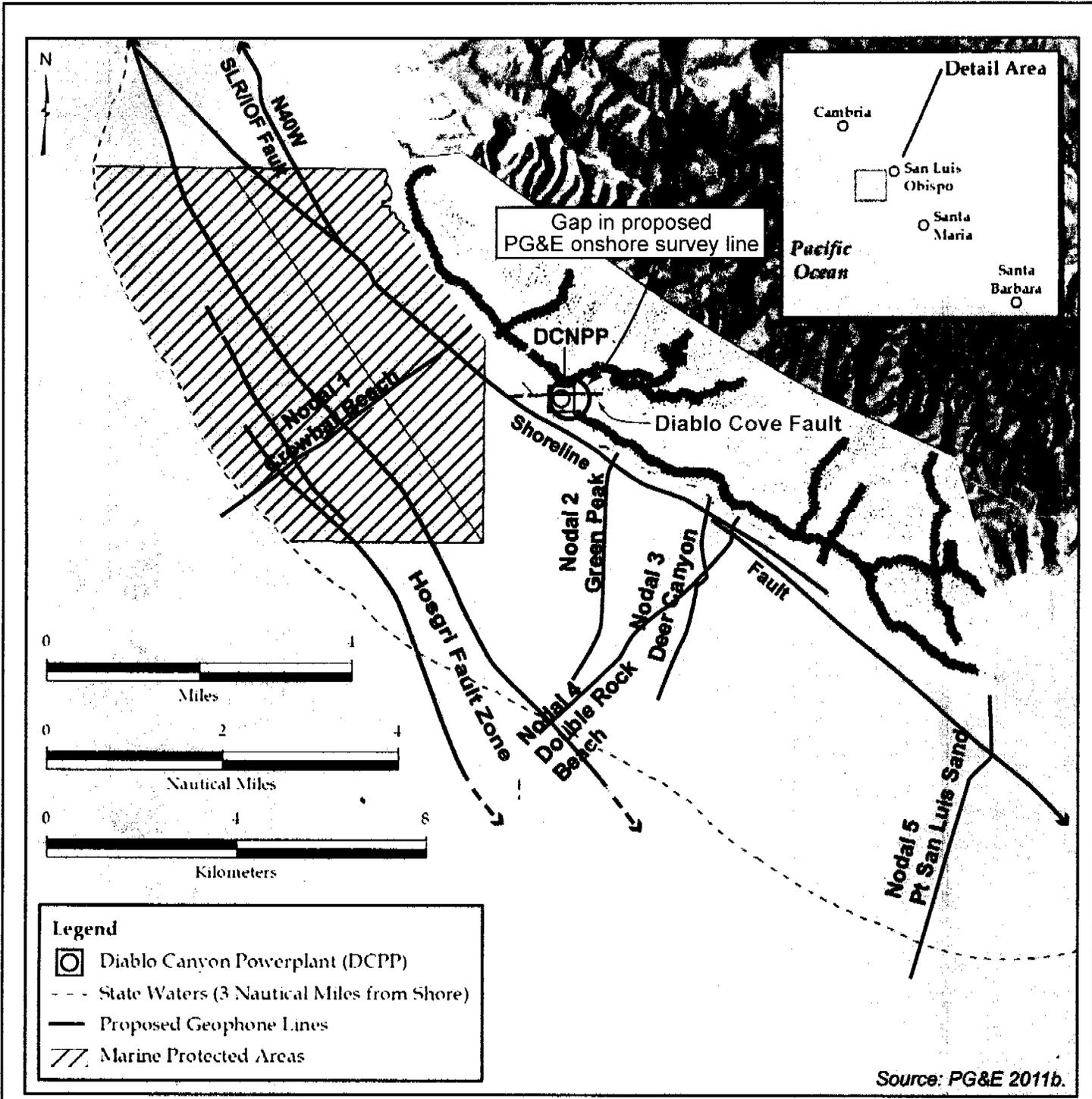
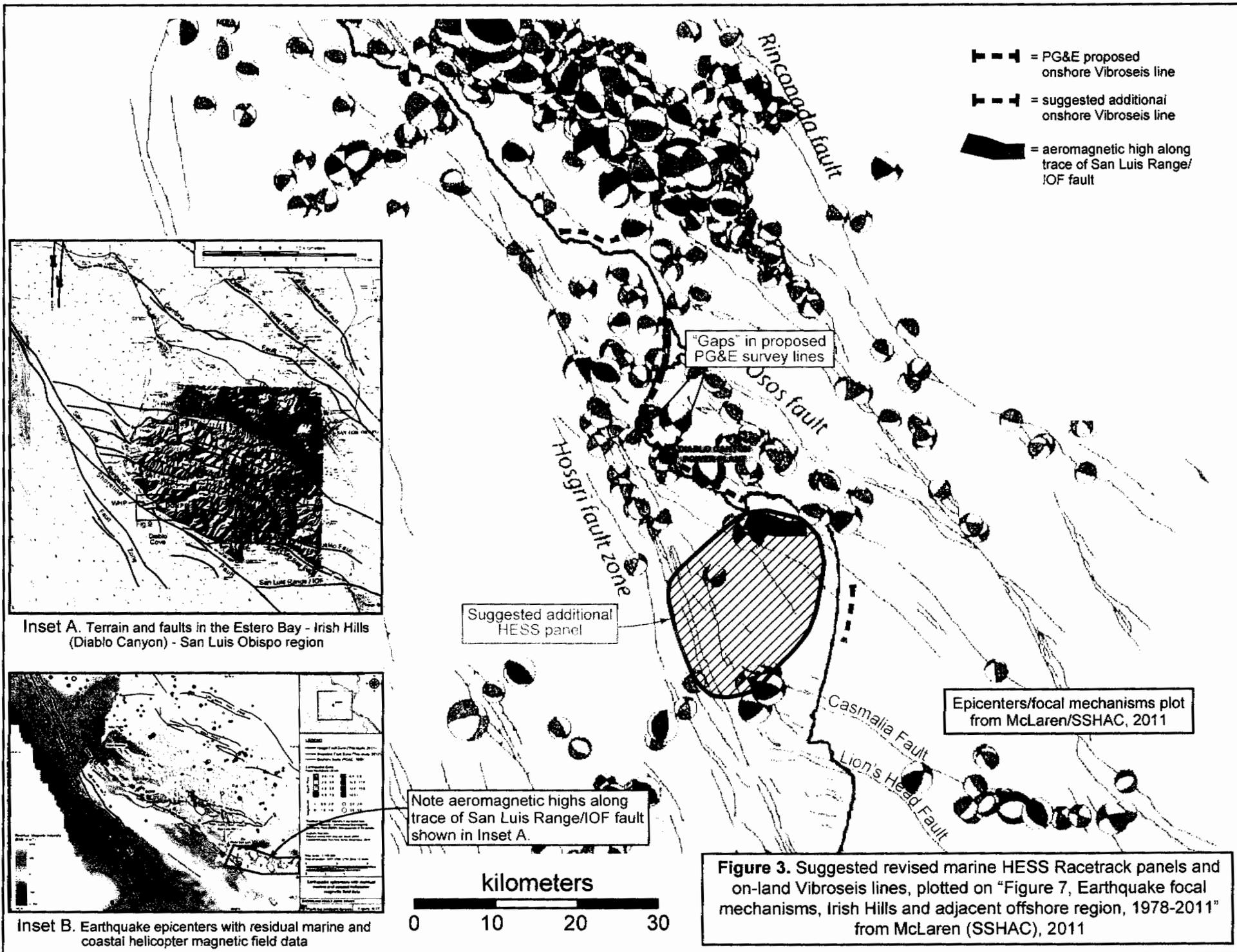


Figure 2. PG&E Proposed Nearshore Geophone Line Routes and Onshore Survey Lines



SAC Telegram Tribune

# 14-year 'cover-up'

## PG&E declined to pursue fault

By Carl Neiburger  
Staff Writer

Pacific Gas and Electric Co. found evidence of an earthquake fault within 500 feet of the Diablo Canyon nuclear power plant in 1967 but chose not to pursue it to avoid "additional speculation and possibly delay the project."

The information was revealed in a 14-year-old memorandum received by the Telegram-Tribune today.

The document described an April 20-21, 1967, meeting between PG&E and Atomic Energy Commission officials to discuss PG&E's proposal to build the Diablo plant.

The Atomic Energy Commission was the predecessor of the Nuclear Regulatory Commission, which now has charge of licensing nuclear power plants.

The memorandum said a "significant" fault had been found in the cliffs above Diablo Cove.

It said that PG&E geology consultant Richard H. Jahns theorized that "this large fault does not run through the site but probably passes to the northwest."

AEC officials "suggested that the exposed fault at the seawall be traced ... to establish its exact location in relation to the containment."

PG&E officials replied "they did not believe this was necessary and that further information of this type would only complicate a contested hearing."

The memo doesn't say how AEC officials responded to this, and NRC officials who attended the meeting said they didn't remember the discussion.

The hearing, at which PG&E was granted an AEC construction permit for the plant, was held Feb. 20 and 21, 1968. The permit was approved on April 23, 1968.

"It's a cover-up. Unbelievable," declared David S. Fleischaker, a lawyer for plant opponents.

"This, on top of the recent discoveries of design flaws, makes the prospects of the plant ever operating one day very frightening for the people of San Luis Obispo," he said.

"It shows the extent to which PG&E has gone to cover up problems of real safety."

Jahns, the geologist quoted in the memorandum, said the reason the fault wasn't researched further was that rock



PG&E declined to extend trenches shown in this 1967 photo of Diablo Canyon to trace a fault in cliffs near the mouth of Diablo Creek, to the lower right of the plant site, according to an AEC memo.

structures "indicated very clearly" that it had been inactive for the past 100,000 years.

Asked if he recalled any discussion of further trenching complicating a hearing, he said, "That may well have occurred during the meeting as an incidental thing."

Jahns said subsequent excavation during construction of the Diablo plant showed no evidence of active faults running beneath the plant.

The 1967 memorandum was written by Keith Woodard, an engineer who then worked with the AEC. He told a reporter he didn't remember writing that particular report, but his job at the time included sitting in on meetings concerning Diablo and taking notes.

"If it's got my name on it, I must have written it," said Woodard, who said he left the AEC about six months after the Diablo meeting and now works with a Washington, D.C., engineering firm.

Woodard said that when the memo was written, "There wasn't any cover-up intended," but, "The world has changed a lot in the last 15 years...."

"When we were licensing these plants (then) we didn't spend anywhere near

the amount of time on engineering problems that we do today."

The Telegram-Tribune contacted several other PG&E and NRC officials and consultants who were listed as attending the 1967 meeting. None were able to remember details of the session.

PG&E representative Suzanne G. Brown said she had asked PG&E engineers who attended the meeting to research their files for records of what happened.

Existence of the memorandum was reported by Stanley Mendes, a Santa Barbara structural engineer, who said it was obtained under a Freedom of Information Act request.

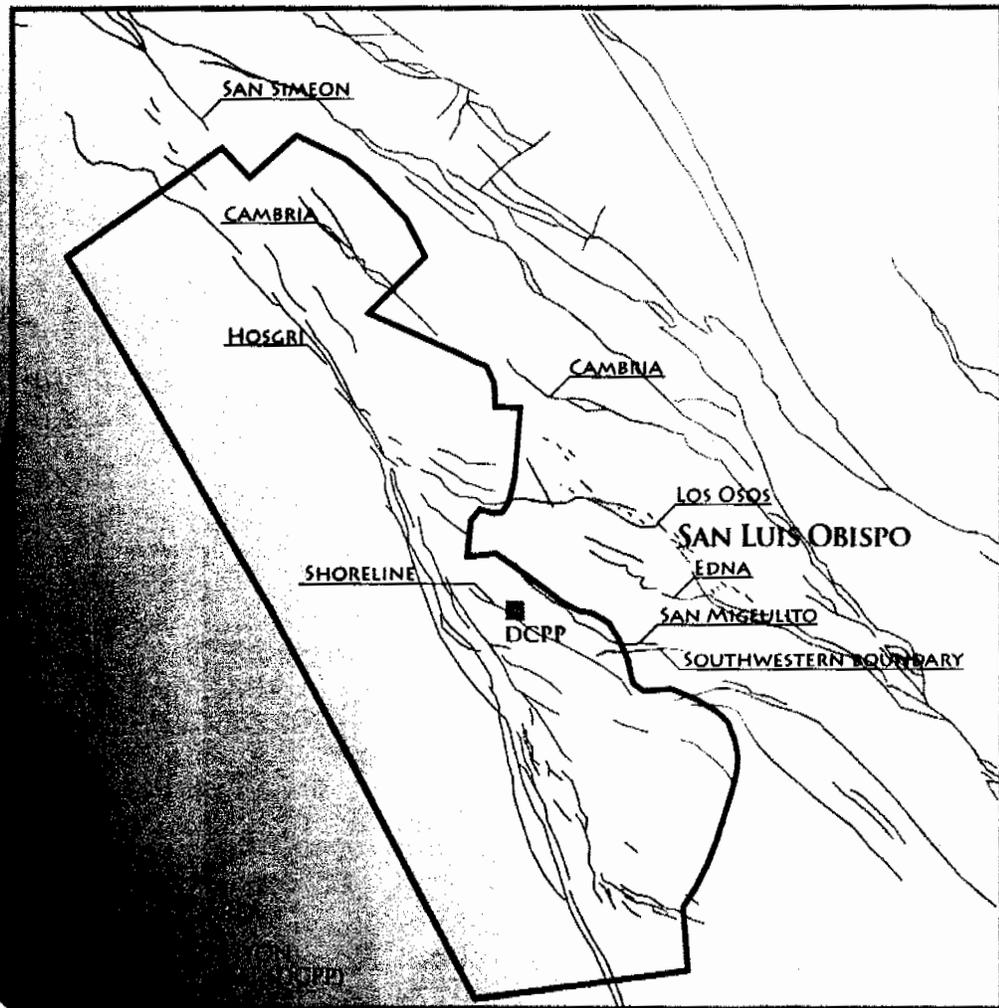
The fault described in the 1967 memorandum was discussed in more detail in PG&E testimony submitted for Diablo licensing hearings in December 1978.

The fault in question "appears on the sea cliff at the mouth of Diablo Canyon, trends northeast and projects toward the ground in the northernmost part of the power plant site," the 1978 report said.

It concluded that the fault wasn't important because microscopic studies had shown minimal evidence of movement.

FINAL  
 ENVIRONMENTAL IMPACT REPORT (EIR)  
 STATE CLEARINGHOUSE NO 2011061085  
 CSLC EIR NO. 758

FOR THE  
**CENTRAL COASTAL CALIFORNIA  
 SEISMIC IMAGING PROJECT**  
 VOLUME 1: PREFACE AND RESPONSES TO COMMENTS



DETAIL



PREPARED FOR:  
 CALIFORNIA STATE LANDS COMMISSION  
 2012



# The Slo Coast Journal

California Sea Otter  
(Enhydra lutris)

Marine Sanctuaries

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Home Journal Business Town Business It's Our Nature Slo Coast Life Slo Coast Arts Archives

## Core Area One of the Proposed Marine Sanctuary Expansion Santa Lucia Bank, Santa Lucia Escarpment, Arguello Canyon and the Persistent Upwelling between Point Conception and Point Sal

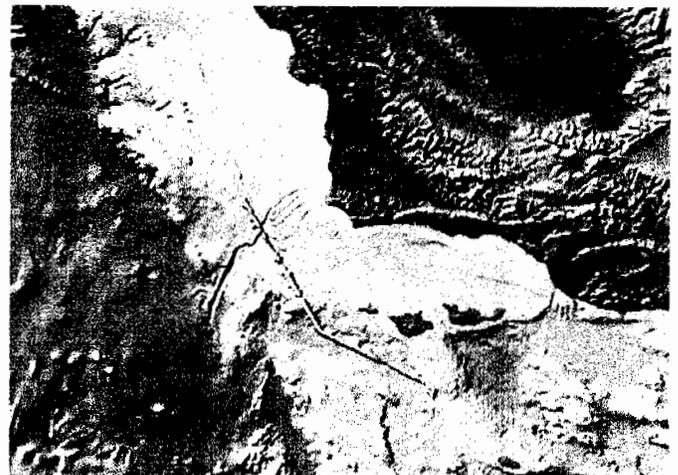
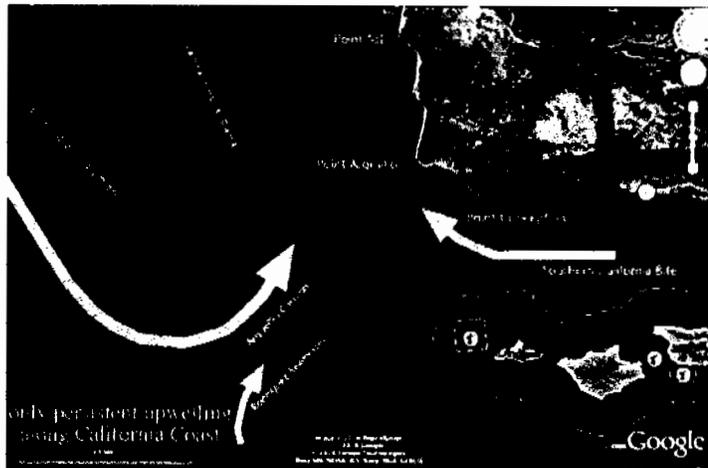
by Carol Georgi and Karl Kempton,  
former Energy Planner for San Luis Obispo County  
and Lead Author of "Proposed Central Coast National Marine Sanctuary, 1990"

### Introduction and Overview

In a marine sanctuary, a core area is usually an internationally or nationally significant ecological unit that needs primary protection and becomes the central focus of a sanctuary. Vital ecosystems supporting significant marine life are clear candidates for protection. Nationally significant historical and cultural features are also nominated for protection. For example, within our proposed area of expansion, Chumash underwater archaeological sites could qualify for core area designation. Within this proposed expansion area, there are several core areas. This article will focus on Core Area One, which is arguably the most important unprotected oceanographic complex feature along the California coast.

### Core Area One

- \* Includes the Santa Lucia Bank, a cetaceous uplift block to within 400 meters of the surface
- \* Includes the five-fingered Arguello Canyon, running NE-SW to a depth of 3000 meters
- \* Contains a vast array of marine life: benthic (deep water) community of world-wide significance, simultaneous gathering of 13 whale and porpoise species, and large numbers of birds and fish
- \* Includes an internationally and nationally significant persistent nutrient-rich upwelling passing through the Arguello Canyon and rising between Point Sal and Point Conception \* feeds the entire web of life along the eastern rim of the Pacific Basin



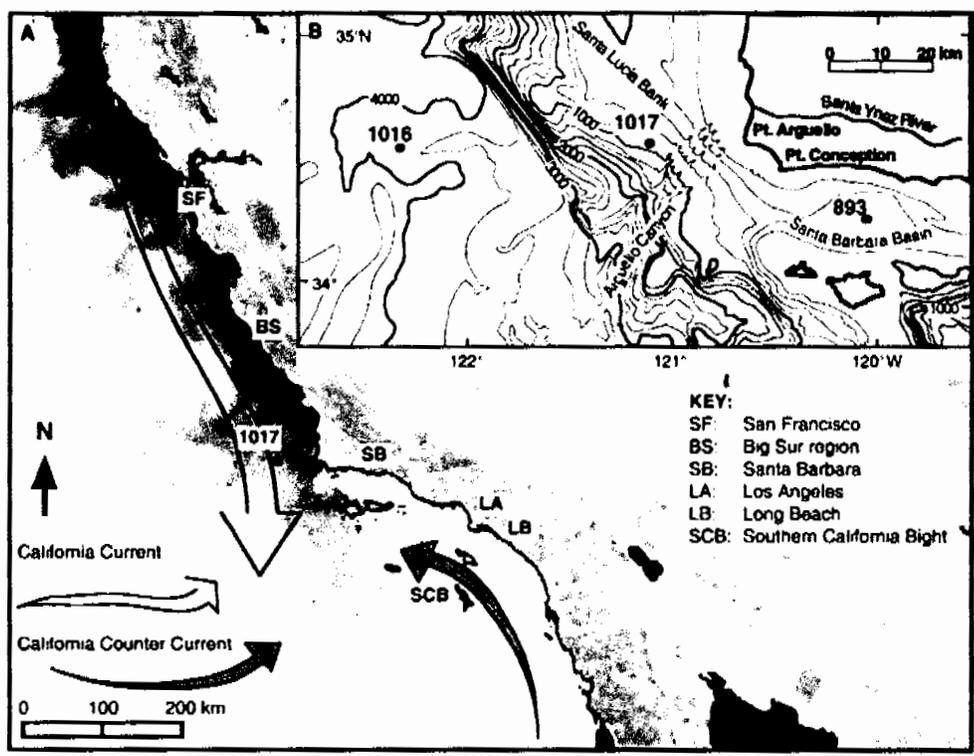
Some of the following details have been gathered from the 1990 Proposed Central Coast Marine Sanctuary Document, posted online, SLO Surfrider.org. Additional details have been added to include areas the document was unable to describe at the time of its writing.

On clear days, Point Arguello can be seen as the prominent western-most point from viewing locations along the northern end of San Luis Bay. From higher ground, Point Conception is visible. The land on which one stands to gaze at this scene is only 25 million years dry. The tectonic, other geologic, oceanographic, and meteorological forces shaping the land are the same forming and shaping the upwelling ocean terrain. This is the southern portion of the Santa Maria Basin; bound on the east by the coastal range, and west on the ocean floor by the upthrust block, the Santa Lucia Bank, 40 miles offshore between Point Sal and Morro Bay. The northern end of the basin ends in the Monterey Bay National Marine Sanctuary at Point Sur. The southern boundary of the basin is the Arguello Canyon. The southern boundary of the Monterey Bay National Marine Sanctuary at Santa Rosa Creek is not a change in either oceanographic features nor ecosystem.

Transition Zone

The persistent, nutrient-rich upwelling flows up the Arguello Canyon, enriching the Santa Lucia Bank, the Arguello Canyon and coastal waters from Point Sal to Point Conception. Here, in a transition zone, blending upwelling nutrients with warm water from the south and cold water from the north, a unique, complex interaction of species and natural phenomena occurs. Feeding the web of life along the eastern rim of the Pacific Basin, the nutrients spread through and beyond both the proposed sanctuary expansion area and designated sanctuary areas, feeding planktonic communities, plants of the kelp forests, and various life stages of marine flora and fauna.

The northern portion of the transition zone between Southern California's warm waters and Northern California's cold waters begins at Point Conception and extends two degrees north to 36 degrees north latitude (20 miles south of Point Sur at Mill Creek Canyon). The proposed sanctuary expansions cover this area north to Santa Rosa Creek. The area is the meeting place of the Oregonian Temperate Eastern Pacific and the Californian Subtropical American Eastern Pacific climates and waters. The region is dependent upon, as well as a cause of, the complex interaction of the southward moving California current, the warmer northward moving subcurrent, the near-shore northward moving seasonal Davidson Current, and the upwelling. The dynamics are not fully understood. Systematic, ecosystem-based research is needed.



The Oregonian weather pattern brings strong northwesterly winds during the spring, a cool marine layer with much fog during the summer, and generally strong wet storms during the winter. The warm, clear autumn months are generally dominated by the California Subtropical climate, which also tempers colder winter weather from the north.

The California Current system flows from the North Pacific and is driven by planetary rotation and large scale winds. Offshore circulation is dominated by this current for most of the annual cycle. The current flows along and near surface at the edge of the

continental shelf. It is generally comprised of low-temperature, low-saline, subarctic waters. The current's position and intensity varies with season and latitude; several coastal currents oppose it.

At the inner edge of this system is the California Undercurrent, characterized by warm saline water. The undercurrent ranges to within 100 kilometers of the coast; it runs from Baja California to Washington State. The undercurrent surfaces in the winter along the coast of Central California.

Closer to land, between the months of October and April, the Davidson Current flows northward along the surface from Point Conception to British Columbia. Its rate, strength, and position vary according to wind patterns caused by dominant seasonal northwesterlies from the Oregonian regime.

Marine Life

Benthic (deep water) communities of world-wide significance thrive in the area. The high diversity and density of benthic populations resemble the North Sea and the Georges Bank, which have been two of the most productive regions in the world. The meiofaunal (small benthic invertebrates) community is among the highest density reported world-wide. The macroinfauna diversities and abundances are much larger than those north or south along the coast of California. *The abundance of benthic populations appears related to the area's unique combination of characteristics: the transition zone, the geology of the area, composition of the sea floor, complex currents, and the upwelling itself.*

The Santa Lucia Bank area is frequently visited year round by cetaceans (whales, porpoises, dolphins). During the fall season at least 13 species of cetaceans have been observed, including simultaneous feeding bouts among humpback, Baird's, fin, blue, and sperm whales and smaller species.

Numerous fish species are harvested commercially. Among harvested species are sablefish, dover sole, shortspine, longspine, and rex sole. Flora and fauna of the area are associated with two distinct oceanographic and climatic provinces. The habitat is the southern boundary of the range for many northern species, and the northern boundary for southern species.

Further research is needed to study the number of bird and fish species found at the Santa Lucia Bank during different seasons. Large numbers of birds have been observed by fishermen during feeding periods. Density maps of seabird populations illustrate the richness of the area. Eastward of the Santa Lucia Bank are a number of unanalyzed spawning areas for fish.

Some of the Threats to the Nutritious Persistent Upwelling

There are many threats to the upwelling as a nutrient source. First and foremost is an oil spill. Despite safety assurances, earthquake or human error can cause a spill. There is no existing cleanup technology for the rough, wind-driven seas of the Santa Maria Basin. Drilling operations add toxins to the ocean environment. With rising ocean levels, the nation's largest underground spill by Unocal in the Oceano-Guadalupe Dunes continues to be a threat. (See Slo Coast Journal, July, 2010)

Another threat is the constant chemical run-off into rivers and streams from commercial farming operations in the forms of fertilizers, pesticides, fungicides, herbicides, and pharmaceutical-laced animal urine. Sewer treatment plants along the Santa Ynez River need to be upgraded to capture all household chemicals and pharmaceuticals. Urban run-off is an additional problem.

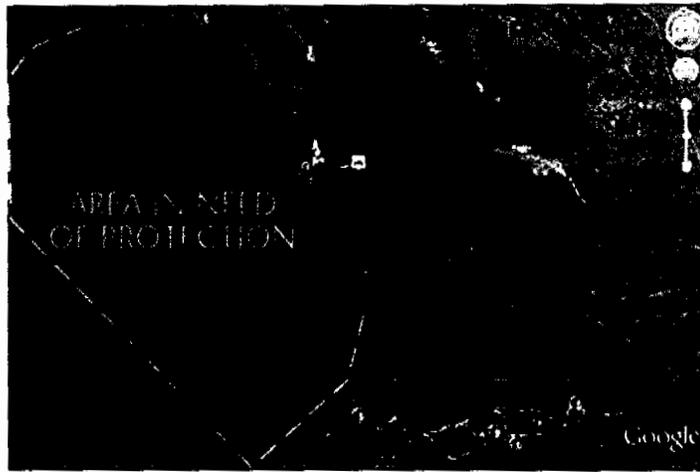
Other threats to the upwelling area north of Point Sal include the Santa Maria River watershed that has tested positive for high levels of human and animal fecal bacteria. "Twenty-eight out of 31 monitoring sites in the Santa Maria watershed—which is spread throughout the Santa Maria Valley, Nipomo, Guadalupe, and a portion of the Los Padres National Forest—were considered "impaired" due to high levels of FIB (E.Coli, Coliform, or Enterococcus). (See Santa Maria Times)

Within the watershed, high levels of pesticides have been reported in fish in the Oso Flaco Lakes and ocean shore fish south of the Pismo Pier. (See San Luis Obispo Tribune) Also, pollutants in ocean currents moving north around Point Conception from the Southern California Bite are a growing threat as populations continue to increase while sewer treatment plants fail to capture industrial and household chemicals and pharmaceuticals.

Additionally, as the Davidson current moves nutrients northward of this area, all sewer outfalls add these chemical cocktails to the ocean waters, affecting filter feeders and those who eat them. Recent studies of cancer in gobi fish in Morro Bay National Estuary (MBNE) are linked to the California Men's Colony sewer treatment plant waters flowing into Chorro Creek, which empties into the MBNE. The studies underscore that these pollutants affect California waters and the ineffective mechanical/traditional treatment plants are probable sources of these chemicals. (See eScholarship)

Lastly, is the threat of toxins moving through the geologic sedimentary formation layers from the closed class one Casmalia Dump in Santa Barbara County? It is a super fund cleanup site that may be leaking. The public has not been informed as to how much is leaking, nor if the toxic materials may be migrating towards the ocean upwelling area, given the slant of the sedimentary formation.

All of these threats, as well as others not mentioned, underscore the importance to expand a national marine sanctuary to protect, study, and sustain Core Area One.



Banner Image of Otter & Pup by [Cleve Nash](#)

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# The Slo Coast Journal

California Sea Otter  
Endangered

Marine Sanctuaries

SloCoast Journal.com

October, 2019

Issue 16

Home Journal Business Town Business It's Our Nature Slo Coast Life Slo Coast Arts Archives

## Core Areas 2, 3, and 4 of the Proposed Marine Sanctuary Expansion

by Carol Georgi and Karl Krypton  
former Energy Planner for San Luis Obispo County  
and Lead Author of "Proposed Central Coast National Marine Sanctuary, 1990"  
Unless otherwise credited, underwater photos are by Terry Lilley with Sue Sloan doing the lighting.

### Introduction and Overview

Our coastal veiwsheds offer magnificent views and vistas that are enjoyed by millions of visitors. The following are internationally and nationally significant features, some that are seen, and others that are unseen, hidden below the surface in the nearshore environment.

- \*Significant California kelp forests
- \*Significant portion of the California sea otter range
- \*World-class fish diversity and densities in rocky intertidal regions
- \*Large numbers of pinnipeds which include a significant percentage of harbor seals
- \*Marine life spawning areas and rookeries
- \*Nurseries of marine life
- \*Whale migration lanes and foraging areas
- \*Chumash archaeological sites continuously occupied for 9,000 or more years

These and other features clearly illustrate the significance of the area. At the time of the writing of the 1990 Marine Sanctuary document with proposed coastal boundaries between Point Sal and Mill Creek in Big Sur, five shore to nearshore core areas were identified as being internationally and nationally significant. When the Monterey Bay National Marine Sanctuary was created with its south boundary at Santa Rosa Creek in San Luis Obispo County, the two northern most core areas were protected. With the new proposed extension plans for sanctuary protection reaching southward to Point Conception, a new shore to nearshore core area has been identified. Also, with new available information, the northern core area has been extended from Cayucos Pier to Santa Rosa Creek. Both of these, as the others, are bounded by the two hundred meter bathymetric line (measuring the ocean bottom terrain). This core area, now numbered 6, and the Point San Luis to Morro Rock and including the inner waters of the Morro Bay National Estuary will be discussed next month.

From south to north, the three shore to nearshore core areas are:

- 2) Point Conception to Point Honda
- 3) Point Sal to Nipomo Dunes Complex
- 4) Northern San Luis Bay Rocky Intertidal Zone



Sea Otter Alop Kelp Forest  
Photo by Carol Georgi

### General features

General features of the shore to nearshore core areas (2 & 4) with kelp forests:

Much of the coastline is dominated by rocky intertidal zones lush with large and



Sunlight in Kelp Forest



Rock Fish



Sea Star



significant kelp forests. Kelp generally requires rocky hard-bottom for attachment and growth, but physical factors such as light availability and amount and type of rocky substrata affect the range of each species. In this environment, kelp, fed by the rich nutrient broth carried by upwellings and their associated currents, can grow 10 inches or more a day, forming a lush underwater habitat.

While we only see the top of the kelp forest floating on the water's surface, kelp canopies can reach depths of 200 feet. Different types of kelp and algae form under-stories which provide numerous benthic (bottom communities), mid-water, and surface habitats, nursery areas, protective covers and food items important for invertebrates, fishes, and sea mammals. Seabirds roost and maintain rookeries on large exposed rocks close by or within the forests. Several endangered marine mammals, sea otters, northern elephant seals, harbor seals, and sea lions inhabit these areas and haul out on the rocks. Gray and humpback whales feed nearshore. Approximately 300 algae species are present.

Rocky intertidal areas host an assortment of invertebrates and fish. Species such as blue rockfish and abalone use cracks and crevices for protection against predators and for breeding.

Kelp forests, the rain forests of the ocean, are found along the coasts of Argentina, through the Straits of Magellan to Chile, off South Africa, Australia, New Zealand, and many sub-Antarctic islands, and from central Baja California to Sitka, Alaska. The most developed of all these kelp forests are found off of the California coast, from San Diego to Santa Cruz.

The kelp forests south of Point Conception are under stress. Some disappeared for a number of years before regrowing. Others are greatly stressed by an over abundance of kelp grazing sea urchins that no longer are threatened by predators. Even the Channel Islands kelp forests are impacted by pollution carried by the Southern California Bight Circulation System. Such stress and impacts on these kelp forests greatly increases the international importance of the unprotected kelp forests between Point Conception and Santa Rosa Creek.

Despite over fifty years of research, the complex dynamics of California kelp forests are not fully understood. The least understood dynamic is that of the nutrient cycle associated with nutrient-rich upwelling waters, seasonal or persistent. The food web is another dynamic needing greater study. Thirdly, the dynamic of kelp forest health and its foragers, the kelp eaters, and their predators is not fully understood. Lastly, winter storms break off the top canopy of the forests, carrying kelp either to the beach or into deeper waters. Exported kelp, slowly moving across the bottom into deeper zones, creates rich habitat for a variety of life forms not yet thoroughly investigated. Ecosystem effects of the drift exceed that of a terrestrial forest because of uses for the kelp far beyond the forest. Marine Sanctuary protection status would set the stage for needed research efforts. For more detailed information, see Chapter 8 Diversity and Dynamics of California Subtidal Kelp Forests by M. Graham.



Sea Star, Sea Anemone, Sponge

Sunflower Star

Details of Core Areas



CORE AREA 2: POINT CONCEPTION TO POINT HONDA

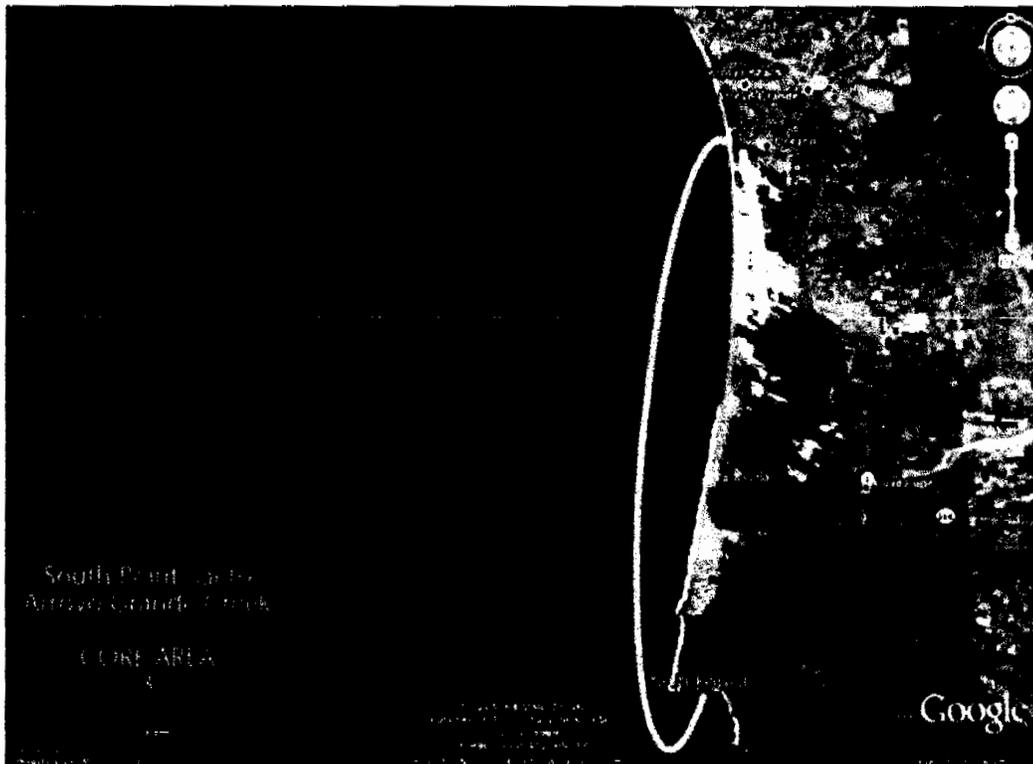
Kelp Forests, Wetlands, Endemic Flora, Birds and Sea Mammals, Haulboats, Significant Chumash Archaeological Sites and Historic Major Ship Wrecks, and a County Beach

The permanent upwelling which flows from Arguello Canyon provides nutrients for the abundant biota of the Point Conception to Point Sal region.

Between Points Conception and Arguello the southern most extensive kelp forests hosts great densities and diversities of flora and fauna. To the north of Core Area 2, the Santa Ynez River forms an estuary at the river and ocean meeting area. It is a site of the endangered Snowy Plover nesting area.

A few miles north of Point Conception is the Jalama County Beach that yearly draws thousands of visitors and campers who enjoy surfing, fishing, and beach combing and its beautiful vistas and long sandy beach and rocky intertidal areas. Jalama Creek forms a wetland area. It is also is the site of a Chumash village. Point Conception is an extremely important Chumash spiritual site. Other significant Chumash sites are associated with the ocean ecology are found in the adjacent coastal terrain.

Arguello Point is the site of several historic ship wrecks. Two miles north of Point Arguello at Point Honda, seven US Navy destroyers sank in 1923. It the country's worst navigational tragedy.



CORE AREA 3: POINT SAL to NIPOMO DUNES COAST (MAP-Core Area 3)

National Natural Landmark, Largest California Coastal Dunes Complex, Wetlands, Endemic Flora, Birds and Sea Mammals, Haulouts

Further north, during migration periods (December through May), large numbers of gray whales stack off Point Sal waiting for guide whales to navigate open water. Lion Rock, 200 yards offshore, is a nesting place for cormorants and endangered Brown Pelicans and a haulout for pinnipeds. Six-hundred sea lions have been counted at one time. The mouth of the Santa Maria River, one of the largest coastal drainages in California, is a Brown Pelican feeding area. Productive stocks of salmon, halibut, shrimp, and other species are harvested by commercial and sport fishermen. Intertidal invertebrate life is abundant on the rocky shores around Point Sal.

The Nipomo Dune complex from Pismo State Park Beach to Point Sal became a National Natural Landmark in 1980. The landmark consists of two contiguous areas: 1) The Guadalupe — Nipomo Dunes, the largest coastal dunes in California, which are fed by sand carried by offshore currents circulating in a littoral cell in San Luis Bay; and, 2) Point Sal, one of the last remaining pristine, rocky coastlines on the South Coast.

The dunes have immeasurable ecological and scenic value along with educational, scientific and recreational importance and represents one of the few coastal areas in the state still in an undisturbed condition. There are beaches, headlands, estuaries, and lakes. Many plants are rare or endangered; a high percentage are endemic to the area. At least 186 species of water and terrestrial birds have been recorded, including the Least Tern, the Peregrine Falcon and the Southern Bald Eagle.

Geologically, the region is complex due to periods of advancing and declining sea levels and to recent uplifting. The creation of dunes led to the formation of wetlands, which, over the last 150 years of Spanish and American presence, have changed dramatically. The dunes, acting as a barrier to the ocean, had formed a freshwater bay which was drained by farmers in the mid 19th century. The movement of sand from land to sea is now hindered by dams; the dunes are thus dependent on sand already present in the San Luis Bay littoral cell.

The drainages of four separate watersheds contribute to the wetland complex. The 1,880 square mile Santa Maria River drainage is one of California's largest coastal river basins. Extensive, tidally influenced wetlands sit at the river's mouth. The river's historic flood plain holds the Oso Flaco Lakes and their associated coastal wetlands. The 10 existing dunes lakes are likely remainders of the freshwater bay.

The unique combination of semiarid and aquatic conditions with a climatic and oceanographic transition zone provides a wide variety of habitat and of associated plant and wildlife species. Coastal dunes, freshwater marshes, riparian habitat, coastal salt marsh, woodland, mudflats, beach, open water, and areas of transition between habitats provide a diversity of life uncommon to much of California.

The wetland and ocean habitat supports an abundance of wildlife. Over 86 species of water-associated birds have been recorded in the wetlands of the Nipomo Dune Complex. Shorebirds, waterfowl, gulls, terns, pelicans, cormorants, coots, rails, loons, grebes, herons, and egrets are among those counted. Least Terns nest and raise fledglings near the Santa Maria River mouth and the Oso Flaco Lakes, Brown Pelicans roost at the shore, and Snowy Plovers inhabit the beaches. Over 100 terrestrial bird species occur among the dunes and related habitats. Among these are the endangered Peregrine Falcon and the Southern Bald Eagle.

Several plant species are found nowhere else. Two species, one aquatic and one terrestrial, reach their extreme limits with the Point Sal - Nipomo Dune complex. At least eight species occurring in the dunes have been listed by the California Native Plant Society as "very rare" and "rare and endangered."

Nearly 50 species of mammals and 33 species of amphibians and reptiles inhabit the dune region. Though not in great numbers, fish are found in the lakes. There is a wide diversity of invertebrates. And the Pismo clam, subject of much recreational and scientific attention, is found along the beaches.

Several significant Chumash village and foraging sites are found in the area. Near the Point Sal area are village sites. A variety of sites are found within the dunes and adjacent to its wetlands. North, the Chumash village site at Pismo Beach has been dated to have been continuously occupied for 9500 years. Extensive shell mounds from thousands of years of clamming have been documented. Other sites line the old Pleistocene era dunes of Nipomo and Arroyo Grande above what was once a large estuary formed by Arroyo Grande Creek and the Price Canyon drainage. Several other sites surround the old estuary on its northern embankment. North, the Chumash village site at Pismo Beach has been dated to have been continuously occupied for 9500 years.





CORE AREA 4: NORTH SAN LUIS BAY INTERTIDAL CORE AREA (MAP-Core Area 4)  
Kelp Forests, Haulouts, Rookeries, Birds and Sea Mammals, Southernmost Major Sea Otter Cluster

The rocky intertidal core area of northern San Luis Bay begins at the northernmost end of the 26 miles stretch of sandy beach called Pismo Beach. From this rocky cliff area along the coastline to the southern end of Avila Beach, another high rocky cliff, the boundary arcs offshore to the 200 meter bathymetric line back to the Pismo Beach rocky cliffs in order to protect prominent offshore rock habitat in the San Luis Bay.

Along this stretch of coast is a major complex of kelp forest; none are found southward until Point Sal. The coastline varies from rocky cliffs with no beaches to cliffs with some beach. Despite the beach areas, the dominant rocky hard bottom offshore provides appropriate habitat for the kelp forest and its lush populations of plant and animal life.

The area is host to the southernmost population of sea otters in the sea otter southern range. In 1990 it was ranked as the sixth largest population cluster. Since then, the population has fluctuated up and down. The reason for these fluctuations remain under study. Pollution from onshore is considered the most likely cause or causes. High cliffs, intertidal rocky areas, beaches along the feet of the cliffs, and nutrients from a nearby upwelling provide a rich environment supporting otters, other sea mammals such as porpoises and sea lions, and large numbers of other species in the web of life.

Numerous offshore rocks provide bird and pinniped habitat. Hundreds of Brown Pelicans, for example, reside in the area. Their numbers swell in the late spring, and remain high until late fall when most return to the Channel Islands for breeding.

Harbor seals haul out among and on the rocks. A resident population of harbor seals offshore Shell Beach is a source of enjoyment for people living in the area or visiting. Porpoises visit the area often. Gray whales pass southward and northward during their migrations. Giant flocks of Sooty Shearwaters feed here in the summer during their travels around the Pacific basin. Huge schools of anchovies moving through are a food source for a wide variety of bird and mammal populations.

Major Chumash sites are directly associated with the core area. Two are known to have been continuously occupied for between 8000 and 9600 years. Historical records from the SLO mission outline the story of all the families being removed from the village nestled against the northern hills of Sunset Palisades and relocated to the mission. Upon arrival families were torn apart. Husbands segregated from wives, mothers from children. Immediately to the south is the Pismo village site for which the present city of Pismo Beach is named; second is a coastal site in the heart of the core area. North along the coastal bench is a third site, where the Chumash have recently returned to renew their ritual ceremony cycle. Just north of the core area is the old Chumash capital of the area in Avila Beach. Its remains have been partially covered by rises in the level of the sea. Also, other archaeological Chumash sites have been covered by ocean rise.

#### Threats

Threats to the kelp forests and their inhabitants are the same as outlined in previous articles for SLO Coast Journal. The threats are onshore and offshore human-caused pollution and extraction of resources.

There are many threats to these core areas. First and foremost is an oil spill. Despite safety assurances, earthquake or human error can cause a spill. There is no existing cleanup technology for the rough, wind-driven seas of the Santa Maria Basin. Drilling operations add toxins to the ocean environment. With rising ocean levels, the nation's largest underground spill by Unocal (1954-1990's) in the Occano-Guadalupe Dunes continues to be a threat.

There is constant chemical run-off into rivers and streams from commercial farming operations in the forms of fertilizers, pesticides, fungicides, herbicides, and pharmaceutical-laced animal and human urine. Sewer treatment plants along the Santa Ynez River need to be upgraded to capture all household chemicals and pharmaceuticals. Urban run-off is an additional problem.

Other threats to the upwelling area north of Point Sal include the Santa Maria River watershed that has tested positive for high levels of human and animal fecal bacteria. "Twenty-eight out of 31 monitoring sites in the Santa Maria watershed—which is spread throughout the Santa Maria Valley, Nipomo, Guadalupe, and a portion of the Los Padres National Forest—were considered "impaired" due to high levels of FIB (E.Coli, Coliform, or Enterococcus).

Within the watershed, high levels of pesticides have been reported in fish in the Oso Flaco Lakes and ocean shore fish south of the Pismo Pier. Pollutants in ocean currents moving north around Point Conception from the Southern California Bite are a growing threat as populations continue to increase while sewer treatment plants fail to capture industrial and household chemicals and pharmaceuticals.

Additionally, as the Davidson current moves nutrients northward of this area, all sewer outfalls add these chemical cocktails to the

ocean waters affecting filter feeders and those who eat them. Recent studies of cancer in gobi fish in Morro Bay National Estuary (MBNE) are linked to the California Men's Colony sewer treatment plant waters flowing into Chorro Creek which empties into the MBNE. The studies underscore that these pollutants affect California waters and the mechanical/traditional treatment plants are probable sources of these chemicals.

Lastly is the threat of toxins moving through the geologic sedimentary formation layers from the closed class 1 Casmalia Dump in Santa Barbara County. It is a super fund cleanup site that may be leaking. The public has not been informed as to how much is leaking, nor if the toxic materials may be migrating towards the ocean upwelling area, given the slant of the sedimentary formation.

Banner Image of Otter & Pup by Cleve Nash

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# The Slo Coast Journal

California Sea Otter  
Enthralled

Marine Sanctuaries

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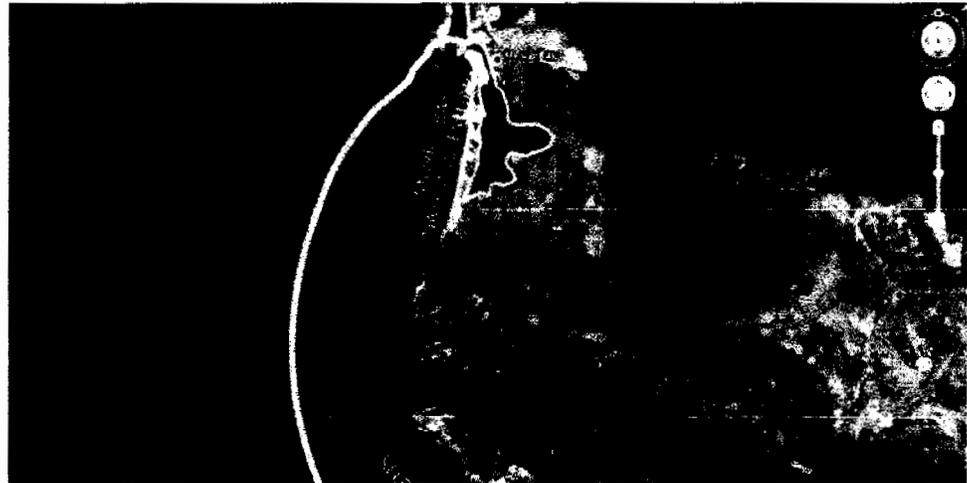
## Core Areas 5 and 6 of the Proposed Marine Sanctuary Expansion Coastal and Nearshore Core Areas from Point San Luis to Santa Rosa Creek

by Carol Georgi and Karl Kempton  
former Energy Planner for San Luis Obispo County  
and Lead Author of "Proposed Central Coast National Marine Sanctuary, 1990"

Unless otherwise credited, underwater photos are by Terry Lilley with Sue Sloan doing the lighting.

Our coastal viewsheds offer magnificent views and vistas that are enjoyed by millions of visitors. The following are internationally and nationally significant features, some that are seen, and others that are unseen, hidden below the surface in the nearshore environment between Point San Luis and Santa rosa Creek.

- \*Significant California kelp forests
- \*Significant portion of the California sea otter range
- \*World-class fish diversity and densities in rocky intertidal regions
- \*Morro Bay National Estuary <http://www.mbnep.org/index.php>
- \*Large numbers of pinnipeds, including a significant percentage of harbor seals and sea lions
- \*Marine life spawning areas and rookeries
- \*Fish nurseries
- \*Whale migration lanes and foraging areas
- \*Chumash archaeological sites continuously occupied between 8,000 and 10,000 or more years.





#### Core Area 5: Point San Luis to Morro Bay

Core Area 5 includes the shore line of the Pecho Coast, located between Point San Luis and the Morro Bay Sandspit, the Morro Bay Sandspit to the north flank of Morro Rock and the inner waters of Morro Bay National Estuary Program, and the nearshore waters out to the 200 meter bathymetry line. This area is situated approximately in the northern area of the proposed expansion area of sanctuary protection.

The Pecho Coast marine environment consists of a 13 mile stretch of intertidal rocky reef beginning at Hazard Canyon in the north to Point San Luis. The shoreline is characterized by sheer, wave-eroded cliffs, jutting headlands, and massive offshore submerged and exposed rocks. Above shoreline the narrow coastal bench is flanked by hills. The tidal zone is generally narrow and may terminate abruptly where protection from wave shock is minimal and deposition is reduced or absent. These topographical features form a highly irregular coastline. The coast provides many different exposed and protected habitats which extend or control the abundance and composition of marine plants and animals.

Long sandy stretches of coastline are found north and south of the reef. The reef supports important communities of vertebrates and invertebrates each integrally dependent upon each other and upon dense stands of canopy formed of kelp and lower growing algae. Damage to or extermination of reef fauna would result in a extremely slow recovery due to the reef's isolation from other rocky coastal habitats and the nonmigratory behavior of indigenous species.

This stretch of coast receives two extremes of human impact. One is the estimate of over half a million visitors per year to Montano De Oro State Park. Camping, fishing, walking, tidal collecting, surfing and seasonal whale migration-watching are the primary visitor activities. Because of the beauty of the area, a scenic trail from Point San Luis to Montano De Oro has been given the highest priority in a new county scenic trails program.

South of the park, controlled industrial activity is the only human activity. The Diablo Canyon Nuclear Power Plant has created, by its demand for security, an absence of active human presence along the coast within the plant's sphere of influence. As a result, the Pecho Coast now contains California's only mainland haulout area for the sea otter (1990), and a mainland haulout area for elephant seals (1990).

Because of the combination of rocky intertidal zone, a seasonal upwelling off Point Buchon, large offshore rocks, kelp beds, climatic and oceanographic province transition zone, and lack of direct human interference, the area between Point Buchon and Point San Luis remains a lush floral and faunal habitat. The area supports a significant and growing population of breeding female sea otters, a large breeding population of sea lions which haul out at Lion Rock, a population of elephant seals which haul out on the mainland, a community of harbor seals, and a large number of seabird species populations. During their migrations, gray whales stack at Point Buchon waiting for a navigator whale to cross open bays on either side.

Waters within the area are considered pristine not only due to the abundance of life as indicators, but because of the presence of Allopora Coral, an hydrocoral. This hydrocoral, a tree-like form usually found in waters 50 meters deep, has been discovered near Lion Rock in waters only 15 meters in depth.

Studies at Diablo Canyon have provided a basis for revolutionary understanding of the age of the Chumash culture. A site here was the first which identified 9,500 years of continuous occupation by the Chumash along the California coastline. The information, for the most part, was based on artifacts dug up and removed from the Chumash Village burial grounds. Several other Chumash sites remain undated.

Diablo Cove has been one of the primary focal points for intertidal research in the proposed sanctuary area. Financed by PG&E, numerous investigations have resulted in descriptions of an abundance of flora and fauna. Among a host of important finds, research shows the area to be an important nursery for both rocky reef and deep water fish. The research supports conclusions that the San Luis Obispo County coastline supports one of the richest intertidal rocky reef fisheries in the world. This research, however, neglected to make public the extensive damage the once-through cooling system of the Diablo Canyon Nuclear Power Plant has done to marine life. See the threats section of this article for more detail.

Offshore seismic studies have also been extensive, resulting in detailed studies of fault zones. Ocean faulting creates habitat for sea life.

Morro Bay is a young geologic feature, less than 15,000 years of age. Rising seas at the end of the last glacier period eroded coastal sands, developing a barrier beach in front of an eastward migrating beach system. The barrier beach, known as the Morro Bay sandspit, extends along the western edge of the estuary. Dunes migrate along the spit, which is about 4 miles long and a quarter mile wide. The spit connects to the mainland at the south end; having no roads or off-road vehicle trails allows a high value animal and plant habitat.

Morro Rock is an ancient volcanic plug which stands at the harbor entrance. It is the most prominent rock feature along the coast of California. A rookery and roost for a number of birds species including the peregrine falcon, Morro Rock has been designated as the Morro Rock Ecological Reserve with an estimated one million visits per year.

Morro Rock is one of a chain of plugs; most are onshore, but the westernmost volcano is submerged 59 fathoms below the ocean's surface 7-1/2 miles due west of Morro Bay. The Chumash attach spiritual value to the volcanoes, with Morro Rock being a pivotal feature in their world-view. The Spanish referred to the plug as the Gibraltar of the Pacific.

The entire sandspit-estuary complex at the center of the broader Estero Bay extends from Point Buchon on the south to Cayucos Point on the north. Estero Bay is a closed littoral cell, from which beach sand apparently does not escape. Large areas of older sand dunes cover much of the shoreline in the southern parts of Morro Bay.

Morro Bay is the only major California estuary south of San Francisco not significantly altered by human activities. As wetlands continue to disappear, Morro Bay's international significance continues to grow. Morro Bay supports many birds protected by international treaty and provides a secure harbor for offshore marine fisheries.

Located within the climatic and oceanographic transition zone province, the bay's unique environment provides habitat for a rich mixture of northern and southern species at the ends of their respective ranges. These and other significant characteristics have brought about the designation of this area as the Morro Bay National Estuary.

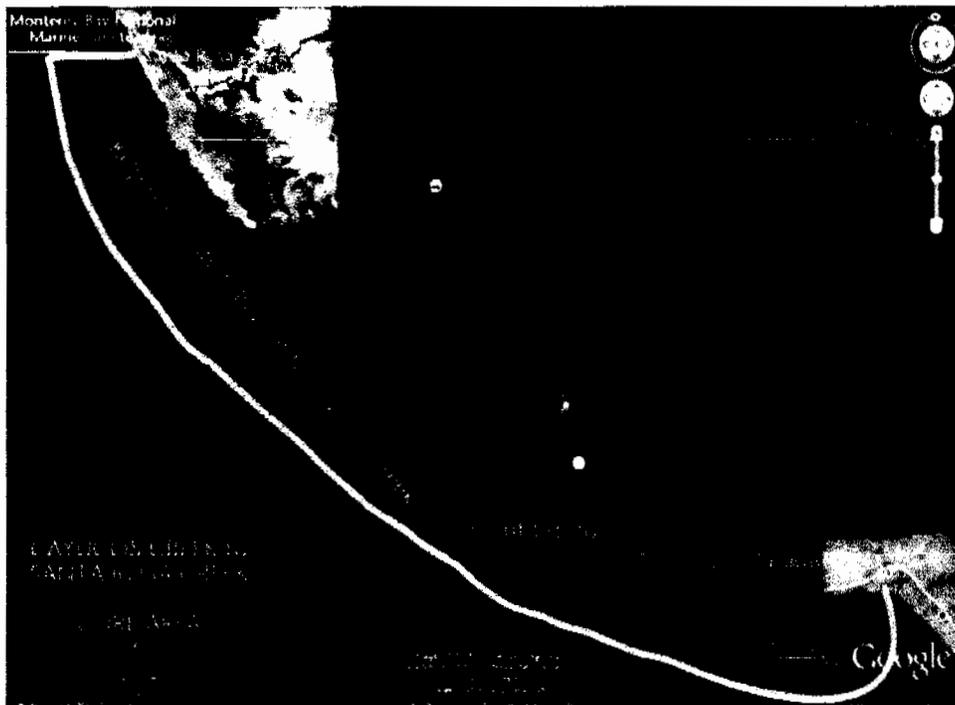
Morro Bay contains the only eel grass bed between Monterey Bay and Seal Beach. This bed acts as a vital nursery for fish and invertebrates. Seventy fish species are listed as occurring in Morro Bay. Thirty fish species are economically important, while most of the rest are ecologically important foraging species.

Besides hosting a commercial fishing fleet, Morro Bay is a site of commercial sea farming. Oysters and mussels are cultured and harvested. Along the southern end on the ocean side of the sandspit a pismo clam reserve has been created.

With over one million visitors a year, tourism dominates the local economy, employing almost 40 per cent of those working in the City of Morro Bay. Morro Bay State Park Campground recorded over 1 million visitor days for fiscal year 89-90. Associated with the park is the Morro Bay Natural History Museum which recorded almost 80,000 visitors for f.y. 89-90.

Recently, over 60 new Chumash archaeological sites were recorded in the area of Los Osos. Where the mouth of a creek once entered Morro Bay, an old Chumash village stood. The village's age is unknown; it was destroyed to make way for an industrial use. Hundreds of Chumash sites ring Morro Bay.

A large number of state and federally listed species reside in or depend on the Bay. Some of these species are the brown pelican, the peregrine falcon, the sea otter, the kangaroo rat, and the golden eagle.



Core Area of Northern Estero Bay Intertidal Core Area

The northern most core area begins on the north side of the Cayucos pier, moves northward along the coastline passed Point Estero to Santa Rosa Creek, arcs outward to the two hundred meter bathymetric line and southward back to the north side of the pier. Santa Rosa Creek is the southern Boundary of the Monterey Bay National Marine Sanctuary. This section of the coastline, with lowlying benches rising to small coastal hills, contains jagged rocky coastline and offshore reef. Facing southward and protected by the hills, a

portion of the area north of Cayucos is protected from prevailing northwest currents, winds and harsh storms. The Cayucos Creek mouth is on the area's southern boundary, and Villa Creek, just south of Point Estero, drains into the heart of the area. Numerous small coves are found along the coastline.

Comprised of rocky intertidal zones associated with dense kelp forests and other algae populations, the area supports a wide diversity of life. One of the largest sea otter population clusters resides within this zone. Offshore rocks provide rookeries and roosting sites for birds and haulouts for pinnipeds. 500 to 600 harbor seals are found here. Whales other than gray whales occasionally visit within this zone. Gray whales stack at Point Estero during migrations.

Between Villa Creek and Point Estero is a commercial abalone farm was established in 1968. It ships its harvest to various national and international customers. From its web site, "The Abalone Farm is a proud participant in the Monterey Bay Aquarium's Seafood Watch program."

The Chumash village site, Cayucos, is found adjacent to the area. Its age seems to be nearly 8000 years of continuous habitation. Further north in Cambria, but south of Santa Rosa Creek, two Chumash village sites have been dated 10,000 years old. Other large sites are also found in the area.

Threats

Several threats to marine life were discussed in the October issue of the SLO Coast Journal. Additional threats to marine life are once-through cooling and poor regulatory oversight leading to possible corruption by power plants and waste water treatment plants.

Nationally, "once-through cooling systems take in billions of gallons of river, lake, and coastal water to cool power plant machinery. Along with the water, these intakes devour fish and other small marine life, resulting in the death and destruction of billions of tons of marine animals a year." Once-through cooling (OTC) has been used at PG&E's Diablo Canyon nuclear power plant since 1985, and is expected to be continued until 2024.

The Morro Bay Power Plant also used OTC, and the power plant's future is still unknown, as reported by Colin Rigley in his recent article, "Exit Strategy - What's in store for the Morro Bay power plant?"

Once-through cooling destroys marine life in two ways—"Impingement" (the capture of larger organisms such as fish and shrimp on screens protecting the small bore tubes of the heat exchangers from blockage) and "entrainment" (the combined effects of temperature, pressure, biocide residual and turbulence/shear on smaller organisms entrained with the cooling water and then expelled back to the aquatic environment in the effluent). Cooling water intake structures cause adverse environmental impact by pulling large numbers of fish and shellfish or their eggs into a power plant's or factory's cooling system. There, the organisms may be killed or injured by heat, physical stress, or by chemicals used to clean the cooling system. Larger organisms may be killed or injured when they are trapped against screens at the front of an intake structure.

As reported by San Luis Obispo's Mothers for Peace, "Two nuclear power plants in California, Diablo Canyon and San Onofre, continue to degrade coastal waters indefinitely. The Federal Clean Water Act requires that cooling water intake structures minimize the environmental impacts to aquatic organisms due to impingement on intake screens and the killing of eggs and larvae as they pass through the cooling water systems. But Pacific Gas & Electric Company (PG&E) admits in its License Renewal Application that "For all regulatory and assessment purposes, entrainment losses caused by Diablo Canyon Nuclear Power Plant (DCNPP) are considered 100 percent of all organisms withdrawn from the Pacific Ocean with the intake flow under all conditions. Annual entrainment of larval fish is estimated to range between 1.48 and 1.77 billion."

According to the California State Waterboard, as reported by San Luis Obispo's Mothers for Peace: "Diablo Canyon entrainment impacts an average source water coastline length of 74 kilometers (46 miles) out to 3 kilometers (2 miles) offshore, an area of roughly 93 square miles, for nine taxa of rocky reef fish. These rocky reef fish included smoothhead sculpin, monkeyface prickleback, clinid kelpfishes, blackeye goby, cabezon, snubnose sculpin, painted greenling, Kelp/Gopher/Black-and-Yellow (KGB) Rockfish Complex, and blue rockfish. In that 93 square mile source water area, an average estimated proportional mortality of 10.8 percent was calculated for these rocky reef taxa. The rocky reef fish species with the largest calculated coastline impact was the smoothhead sculpin, having an estimated proportional mortality of 11.4 percent over 120 kilometers (75 miles) of coastline during a 1997-98 sampling period. (Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, State Water Resources Control Board, California Environmental Protection Agency, at 30.)



Copper Rockfish

Kelp Rockfish

Monkeyfish Eel

Rockfish

Cabezon

Further, as reported by San Luis Obispo's Mothers for Peace, the California State Waterboard stated in its 2000 Staff Report:

"the CRWQCB noted that: The most significant and consistent biological effects caused by PG&E's Diablo Canyon thermal discharge occur mainly along the intertidal and shallow subtidal marine environment. The intertidal and shallow subtidal zone in Diablo Cove is the most heavily impacted, with major reductions in important species such as habitat forming algae and intertidal fish. (at 1) Regional Board staff contends that thermal effects exceed those anticipated by the State and Regional Board when the plant was permitted and so do not protect beneficial uses as required by the Thermal Plan. (at 1) The entrainment study at Diablo Canyon was overseen by a technical workgroup that included independent consultants for the Regional Board (Dr. Greg Cailliet, MLML; Dr. Roger Nisbet, UCSB; Dr. Allan Stewart-Oaten, UCSB), a consultant for the League for Coastal Protection (Dr. Pete Raimondi, UCSC), and PG&E and its consultants from Tenera. The technical workgroup reviewed all aspects of the study, including sampling equipment, sampling periods, target species selection, larval identification, and analyses of the results via a process that continued for almost five years. Entrainment Studies at Diablo Canyon began in October 1996, and continued through June 1999 (about 2 ? years of sampling in front of the intake structure). (at 2) The results show that: the amount of larvae lost for nearshore species is relatively high. These non-harvested near shore species have no direct dollar value in terms of commercial fisheries, but are important in an ecological sense. For several nearshore species (sculpins, kelpfish, blackeye goby, monkeyface, prickleback), the amount of larvae taken by the power plant is large relative to the amount available in the source water body. (at 3) Since several of the ETM values for nearshore species are relatively high (up to 32% for clind kelpfishes), and related monitoring data indicate potential population declines, staff believes that the intake system causes an adverse impact on nearshore species. (at 4) Recent state studies show that the use of OTC by power plants contributes to the degradation of estuaries, bays, and coastal waters."

Impingement kills marine life and is also a threat to the safe operation of a nuclear power plant. For example, in 2008, a large quantity of jellyfish became impinged and the power plant had to be manually shut down.

Jellyfish Shut Down Diablo Canyon Power Plant  
Wiggly, Jiggly Invaders Cause Both Reactors to Be Taken Offline  
Thursday, October 23, 2008

"An unprecedented invasion of jellyfish earlier this week managed to accomplish what decades worth of activists have failed to do: Shut down San Luis Obispo County's Diablo Canyon Nuclear Power Plant. Shortly before 9 p.m. Tuesday, alarms began to sound at the Pacific Gas and Electric's Avila Beach facility. Water pressure readings for the power plant's cooling system were skyrocketing and no one could figure out why. After a team of scuba divers surveyed the underwater scene of the bay that feeds the plant's intake valves, they determined the culprit: Hundreds of moon jellyfish (*Aurelia aurita*) had jammed the pipes, prompting officials to power down the plant.

While no permanent damage was done, according to PG&E spokesperson Sharon Gavin, the two-reactor facility - which pumps out about 18,000 gigawatt hours of electricity a year - was severely hamstrung by the invasion with one reactor operating at half capacity and the other completely shut down for about two days. As of press time, the unit 1 reactor was back up to 97 percent of operating capacity while unit 2 remained totally shut down. The moon jellyfish is no stranger to area waters, but the impact of this week's swarm is unheard of, Gavin said. And while no PG&E customers have lost service as a result of the intake attack, the mess is far from an easy cleanup.

"Our divers are not seeing anymore jellyfish action right now, so that's a good thing," Gavin said.

But there is still work to be done before the plant will be fully operational. With hundreds of jellyfish "about the size of a basketball" caked on the filter screens found in the bowels of the intake pipes, divers have been working to scrape the jiggly invaders off in hopes of getting the second reactor back up to speed before the weekend."

To repeat, Diablo Canyon power plant's once-through cooling system impacts fish larvae 47 miles along the shore and in nearshore waters as far as 2 miles out. As shown above in Core Area 5, the kelp forest along the Pecho Coast is of great significance as well as the inner waters of the adjacent Morro Bay National Estuary waters where the now rare eel grass provides shelter for fish nurseries. The direct and indirect destruction reaches south into Core Area 3 and north into Core Area 6. Our San Luis Obispo (SLO) County coast line is about 109 miles in length. This means almost half our SLO County nearshore waters are negatively impacted by PG&E's nuclear power plant.

The threats posed by this nuclear power plant to our environment are many, ongoing, and potential.

The ongoing environmental destruction is caused by the once-through cooling system. When the nuclear power plant began operation, sufficient data was already available pointing to the destruction of incredible numbers of larvae. The information was established at San Onofre nuclear power plant where a large 'sand bar' of dead sea life formed. Only recently has the public been given the statistic of one and a half billion fish larvae become entrained yearly with 90 per cent killed. Then there are the eggs and planktonic flora also being destroyed. By multiplying this number by the number of years the plant has been in operation (since May 1985) gives one an idea of how much richer our area would be without this destruction. Licensed to Kill Executive Summary

An example of poor regulatory oversight leading to possible corruption was found at the PG&E Diablo Canyon power plant in the spring of 2000, as documented by a quote from San Luis Obispo's Mothers for Peace article, Pacific Gas & Electric (PG&E), for many years, provided state water authorities with skewed data on its Diablo Canyon nuclear power station. The data showed that the plant's intake of billions of gallons of water a day did very little harm to surrounding marine life. PG&E's conclusions were based on

the unscientific formula that the amount of sea life drawn into the system at the intake port could be accurately measured by the amount of small fish and other organisms at the outflow of the cooling system.

In the spring of 2000, Diablo Canyon's operators were discovered to have withheld information from environmental regulators for two decades revealing the true effect of the reactor's hot water discharges into the coastal waters off Diablo Cove and miles beyond. The concealed data included infrared images indicating more extensive thermal plume impact zones than previously admitted and time-series photographs showing the progressive deterioration of biologically important marine habitat in coastal waters around the reactor. The damage was catastrophic to the indigenous marine life community, including the near obliteration of the already threatened black and red abalone populations. The concealed findings also revealed up to a 90 percent destruction of many varieties of sea life as they passed through Diablo Canyon's cooling system. These findings had never been reported to state or federal agencies.

From Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, State Water Resources Control Board, California Environmental Protection Agency, at 1,

Also, what remains hidden from public awareness is the ongoing low level radiation exposure to the marine environment. In the 1990's what was once public record has now been removed, cancer rates by zip code. A nuclear power plant cannot 'economically' operate without release of low levels of radiation. So-called oversight regulators deemed such levels not harmful.

Lastly, another example of poor regulatory oversight leading to possible corruption is currently being investigated at the San Luis Obispo County's waste water treatment plant. Accusations include improper water-testing and inaccurate record-keeping.

Worker Claims Ulterior Motive Allegations of Misdeeds Dog the Sewage Plant

Banner Image of Otter & Pup by Cleve Nash

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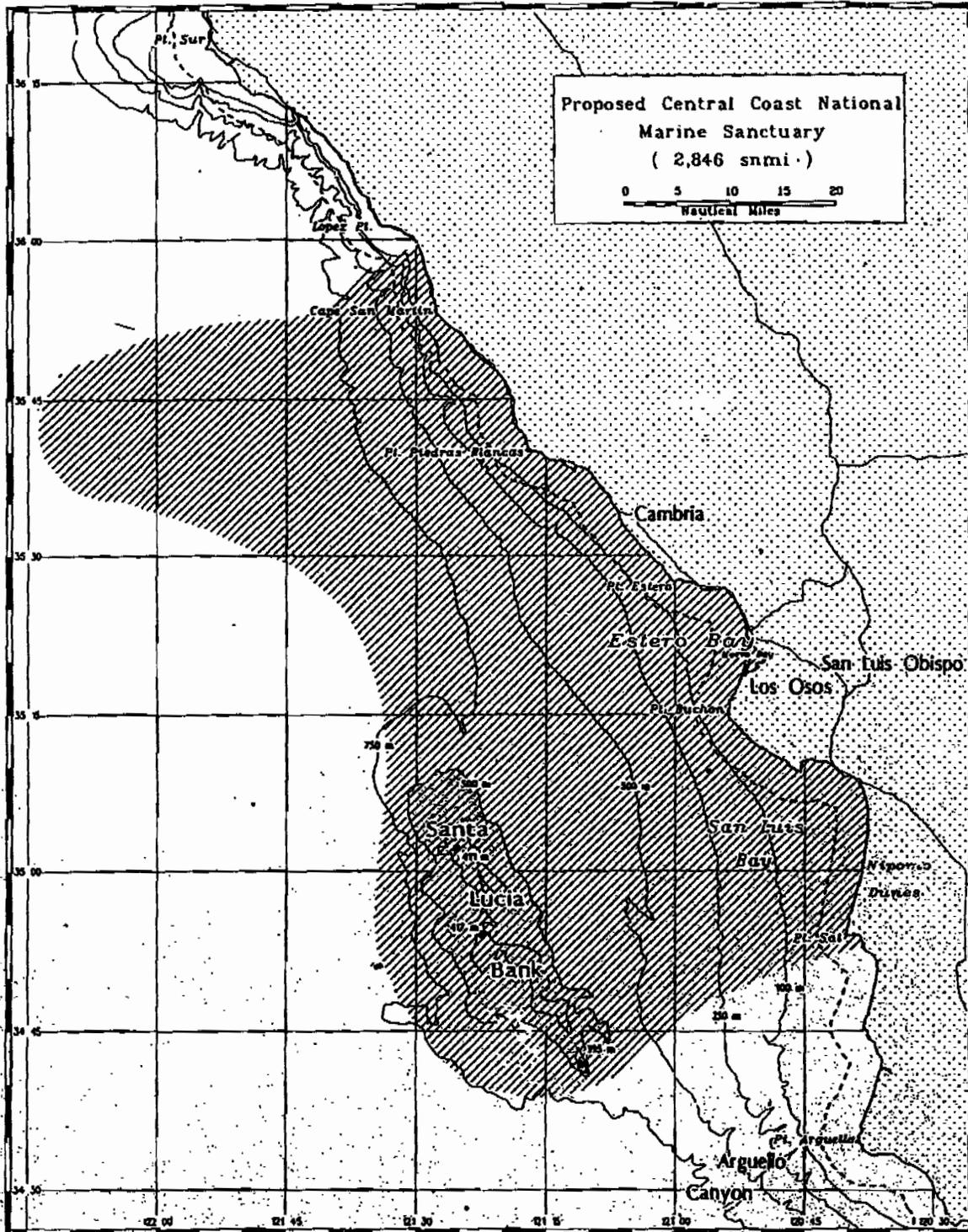
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PROPOSAL TO EXTEND THE MORRO BAY SITE DESIGNATION CANDIDACY TO INCLUDE OUTER WATERS BETWEEN MILL CREEK, MONTEREY COUNTY, CALIFORNIA, AND THE SOUTHERN FLANK OF POINT SAL, SANTA BARBARA COUNTY, CALIFORNIA

**SLO Marine Sanctuary**

101ST CONGRESS  
2D SESSION

# H. R. 5973

To designate the waters of the central coast of California as a national marine sanctuary.

---

## IN THE HOUSE OF REPRESENTATIVES

OCTOBER 27, 1990

Mr. PANETTA introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

---

## A BILL

To designate the waters of the central coast of California as a national marine sanctuary.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 SECTION 1. SHORT TITLE.

4 This Act may be cited as the "Central Coast National  
5 Marine Sanctuary Act".

6 SEC. 2. CONGRESSIONAL FINDINGS.

7 The Congress finds that—

- 8 (1) the waters of the Central Coast have special  
9 national cultural, educational, research, and economic  
10 significance, because of their—

1 (A) unique physical characteristics, including  
 2 major permanent upwellings and current interac-  
 3 tions located in the Californian transition zone be-  
 4 tween the Oregonian and Californian climatic  
 5 provinces and its interrelationship with the  
 6 Nipomo Dunes-Point Sal National Natural Land-  
 7 mark,

8 (B) unique ecological and biological charac-  
 9 teristics and productivity, including the presence  
 10 of many endangered or threatened species of  
 11 marine mammals, birds, and reptiles and a mix-  
 12 ture of fish, mammal, shellfish, and plant species  
 13 not found elsewhere in the Pacific Basin, and

14 (C) important economic values, including  
 15 commercial and recreational fishing and tourism;

16 (2) the contamination of the waters of the Central  
 17 Coast, particularly from—

18 (A) the drainage of pesticides and other toxic  
 19 chemicals into tributaries of the waters,

20 (B) the outfall of municipal sewage, and

21 (C) the proximity of growing adjacent urban  
 22 populations and expanding industrial uses of the  
 23 waters;

1 is increasing at a rate which causes great concern for  
2 the health, habitat, and continued productivity of the  
3 waters;

4 (3) the existing State and Federal regulatory and  
5 management authorities applicable to the waters of the  
6 Central Coast are inadequate to provide the kind of  
7 comprehensive and coordinated conservation and man-  
8 agement of this nationally significant marine environ-  
9 ment that is available under the Sanctuary Act;

10 (4) the waters of the Central Coast are a discrete  
11 ecological unit with definite boundaries and are accessi-  
12 ble and suitable for monitoring and enforcement activi-  
13 ties;

14 (5) the benefits from designating the waters of the  
15 Central Coast as a national marine sanctuary, includ-  
16 ing the socioeconomic benefits and the protection of its  
17 nationally significant resources and habitats and re-  
18 sources supporting major tourism activities, outweigh  
19 any potential negative impacts on other industrial uses  
20 of the Central Coast; and

21 (6) the designation and treatment of the waters of  
22 the Central Coast as a national marine sanctuary is  
23 necessary for the preservation and protection of this  
24 unique area of the national marine environment as an  
25 area of national significance.

1 SEC. 3. CONGRESSIONAL DESIGNATION.

2 The Congress—

3 (1) declares that the waters of the Central Coast  
4 meet the standards set forth in section 303(a) of the  
5 Sanctuaries Act; and

6 (2) designates the waters of the Central Coast,  
7 subject to section 5, as a national marine sanctuary  
8 under the Sanctuaries Act.

9 SEC. 4. SECRETARIAL FUNCTIONS.

10 (a) IN GENERAL.—Before the end of the 18th full  
11 month after the date of the enactment of this Act, the Secre-  
12 tary shall—

13 (1) prepare a draft environmental impact state-  
14 ment, as provided for in the National Environmental  
15 Policy Act of 1969 (42 U.S.C. et seq.), on the designa-  
16 tion made under section 3(2), which statement shall in-  
17 clude, with respect to the waters of the Central  
18 Coast—

19 (A) a resource assessment report of the kind  
20 described in section 303(b)(3) of the Sanctuary  
21 Act,

22 (B) maps depicting the boundaries, and

23 (C) a description of the existing and potential  
24 uses;

25 (2) make copies of the draft environmental impact  
26 statement available to the public, and thereafter hold

1 at least one public hearing in the coastal area or areas  
 2 that will be most affected by the designation for pur-  
 3 poses of receiving the views of interested persons;

4 (3) prepare, after taking into account the views  
 5 received under paragraph (2) and after consulting with  
 6 the appropriate State and local officials, a draft man-  
 7 agement plan detailing—

8 (A) the proposed goals and objectives for the  
 9 sanctuary designated under section 3(2);

10 (B) the respective management, educational,  
 11 and enforcement responsibilities of the appropriate  
 12 Federal, State, and local government agencies for  
 13 achieving the goals and objectives referred to in  
 14 subparagraph (A); and

15 (C) proposed regulations to implement the  
 16 Federal responsibilities under subparagraph (B);  
 17 and

18 (4) submit the draft management plan prepared  
 19 under paragraph (3) to each House of the Congress on  
 20 the same day.

21 (b) FISHING REGULATIONS.—Section 304(a)(5) of the  
 22 Sanctuary Act applies to the preparation and issuance of reg-  
 23 ulations regarding fishing in the United States Fishery Con-  
 24 servation Zone that are necessary to implement the designa-  
 25 tion made under section 3(2).

1 SEC. 5. DESIGNATION APPROVAL AND IMPLEMENTATION.

2 (a) IN GENERAL.—The designation under section 3(2)  
3 and the draft management plan and regulations prepared  
4 under section 4 shall take effect at the close of the 45-day  
5 period beginning on the day after the date on which the draft  
6 management plan is submitted to Congress under section  
7 4(a)(4), unless before the close of such period there is enacted  
8 a joint resolution which states after the resolving clause the  
9 following: “That the Congress disapproves the designation of  
10 the Central Coast National Marine Sanctuary.”. Section  
11 304(b)(4) of the Sanctuary Act applies to such a resolution,  
12 and subparagraph (C) of such section shall be treated as in-  
13 cluding this subsection.

14 (b) APPLICATION OF SANCTUARY ACT.—The following  
15 provisions of the Sanctuary Act apply with respect to the  
16 Central Coast national marine sanctuary designated under  
17 section 3(2) (and effective under subsection (a)) to the same  
18 extent as if such sanctuary had been designated and approved  
19 under that Act:

20 (1) Section 304(c) (relating to access and valid  
21 rights).

22 (2) Section 305 (relating to application of regula-  
23 tions and international agreements).

24 (3) Section 306 (relating to research and educa-  
25 tion).

26 (4) Section 307 (relating to enforcement).

1 (5) Section 308 (relating to appropriations).

2 SEC. 6. DEFINITIONS.

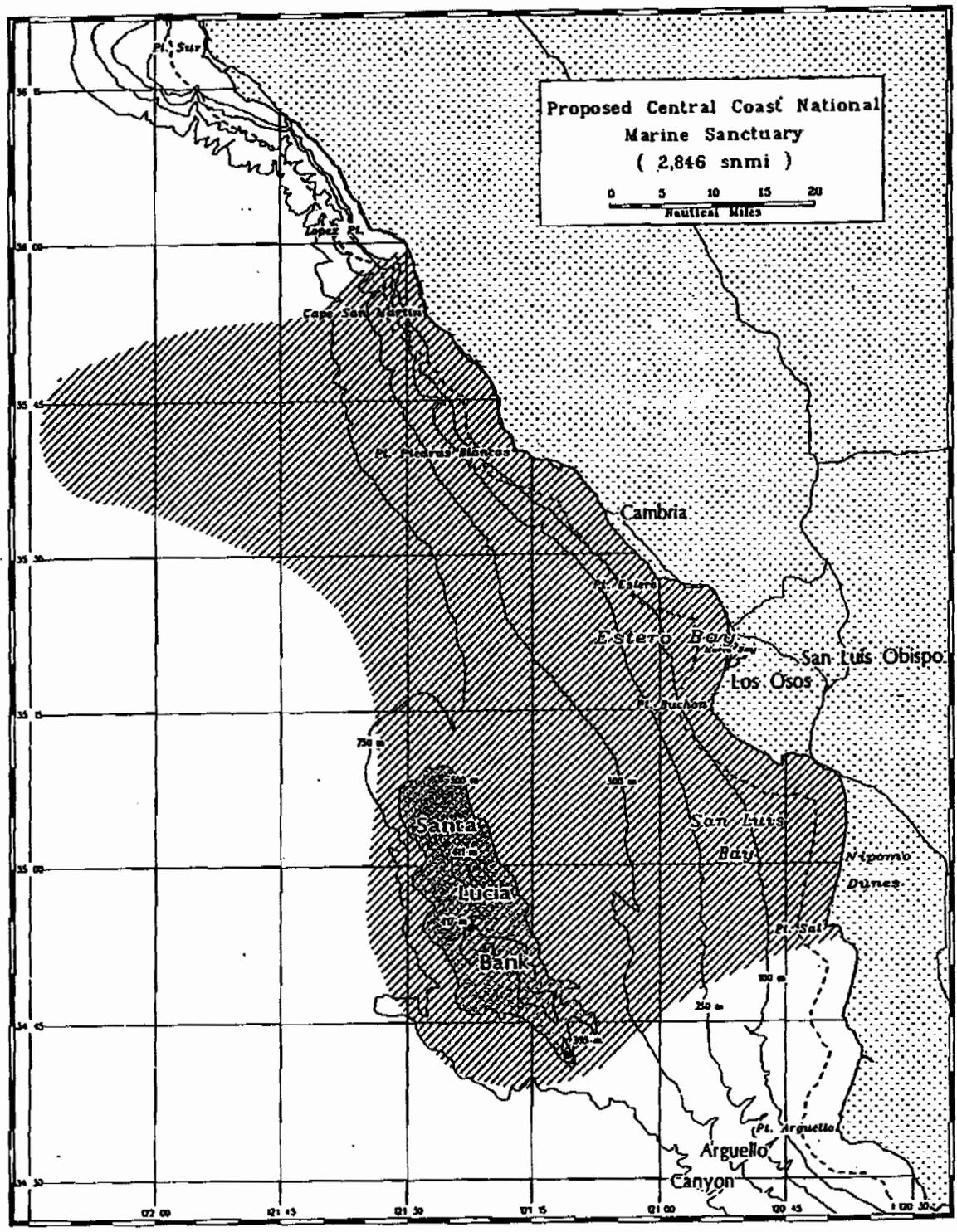
3 As used in this Act—

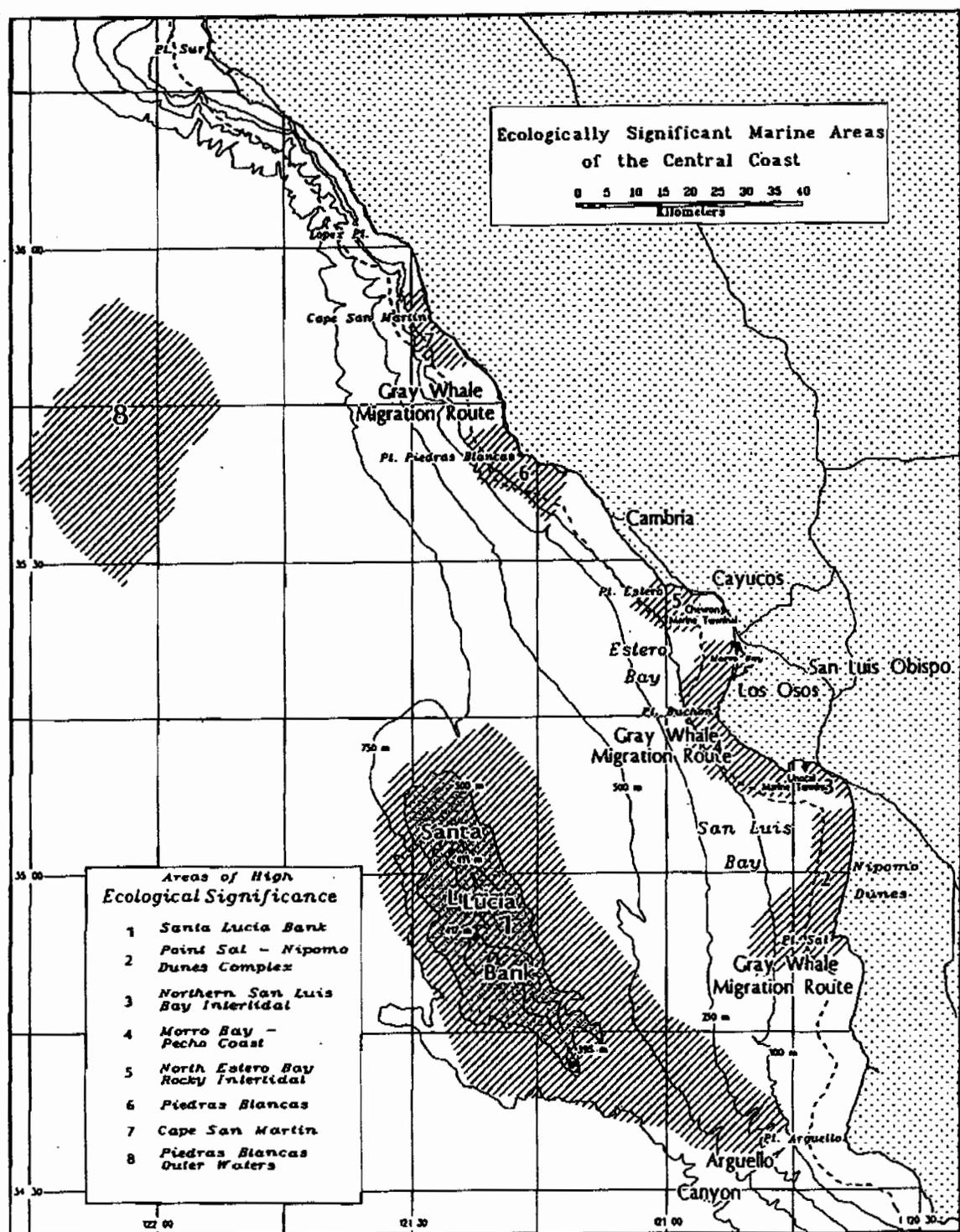
4 (1) the term “waters of the Central Coast” means  
5 that portion of the waters off the coast of California  
6 seaward of the high tide line from the southern bound-  
7 ary of the Monterey Bay National Marine Sanctuary  
8 (as that southern boundary is established in the final  
9 designation of that sanctuary), to the southern bound-  
10 ary of Point Sal Beach State Park in Santa Barbara  
11 County, California, and extending westward from Point  
12 Sal, California, to encompass the offshore Santa Lucia  
13 Bank;

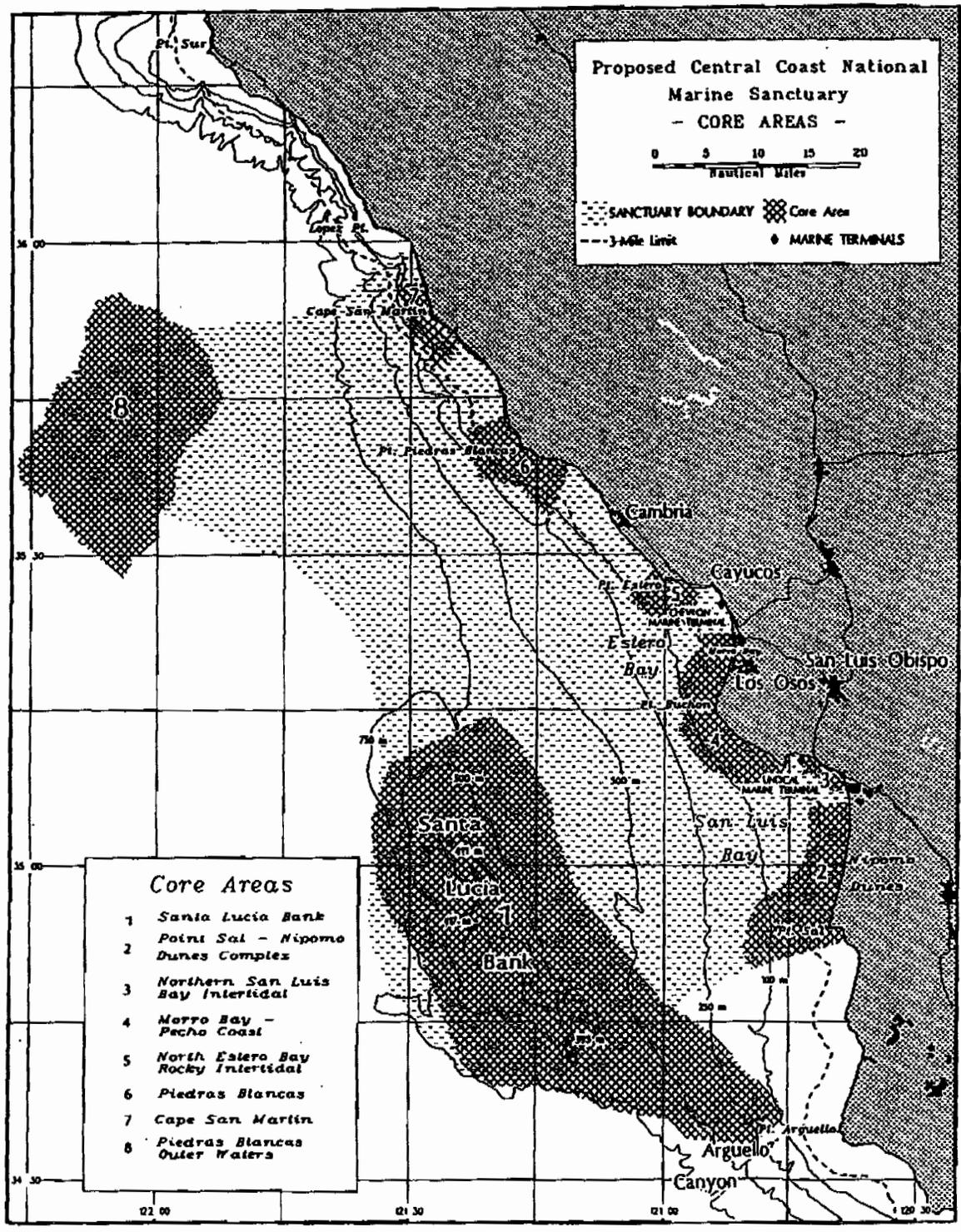
14 (2) the term “Sanctuary Act” means title III of  
15 the Marine Protection, Research, and Sanctuaries Act  
16 of 1972 (16 U.S.C. 1431 et seq.); and

17 (3) the term “Secretary” means the Secretary of  
18 Commerce.

○





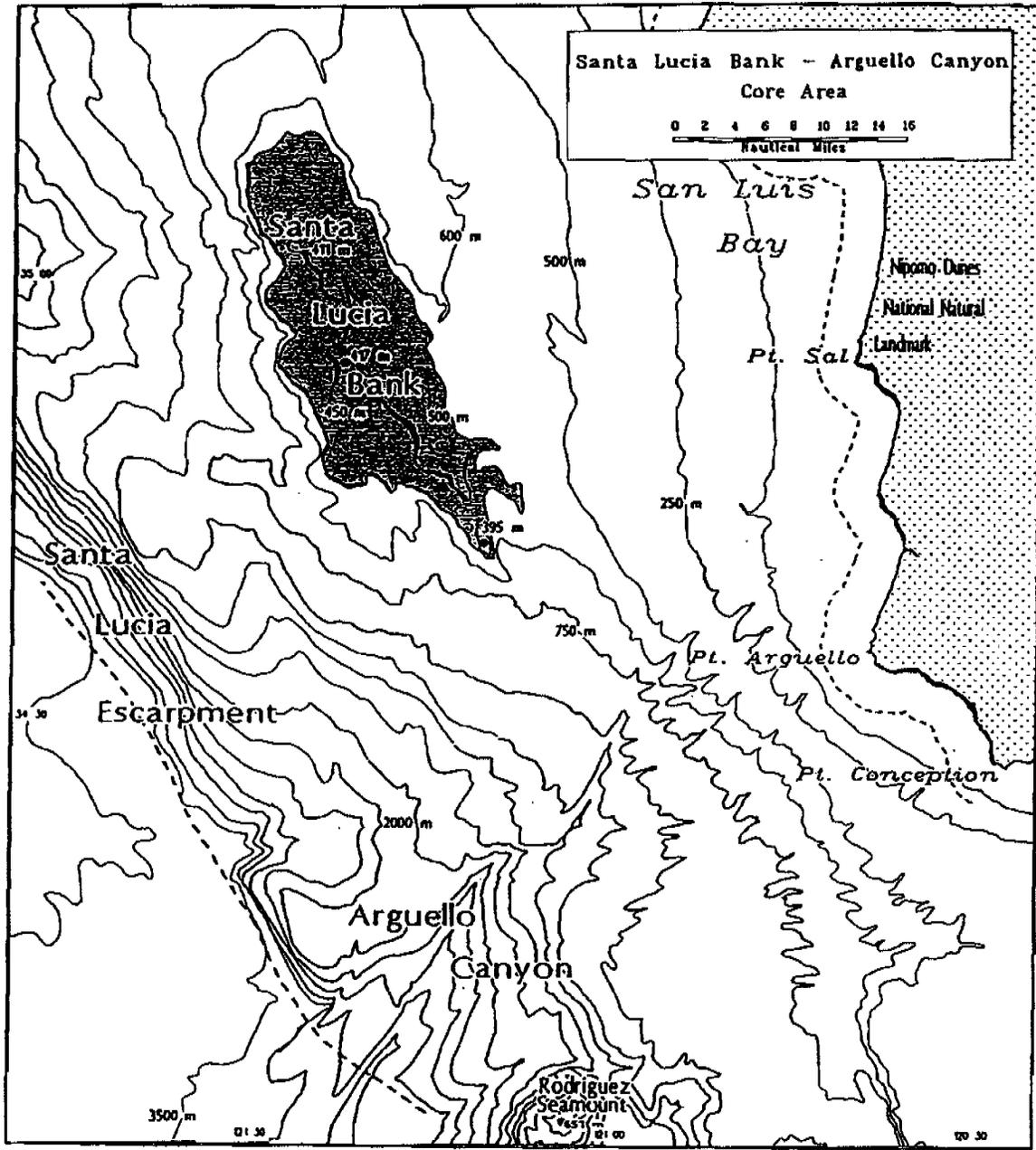


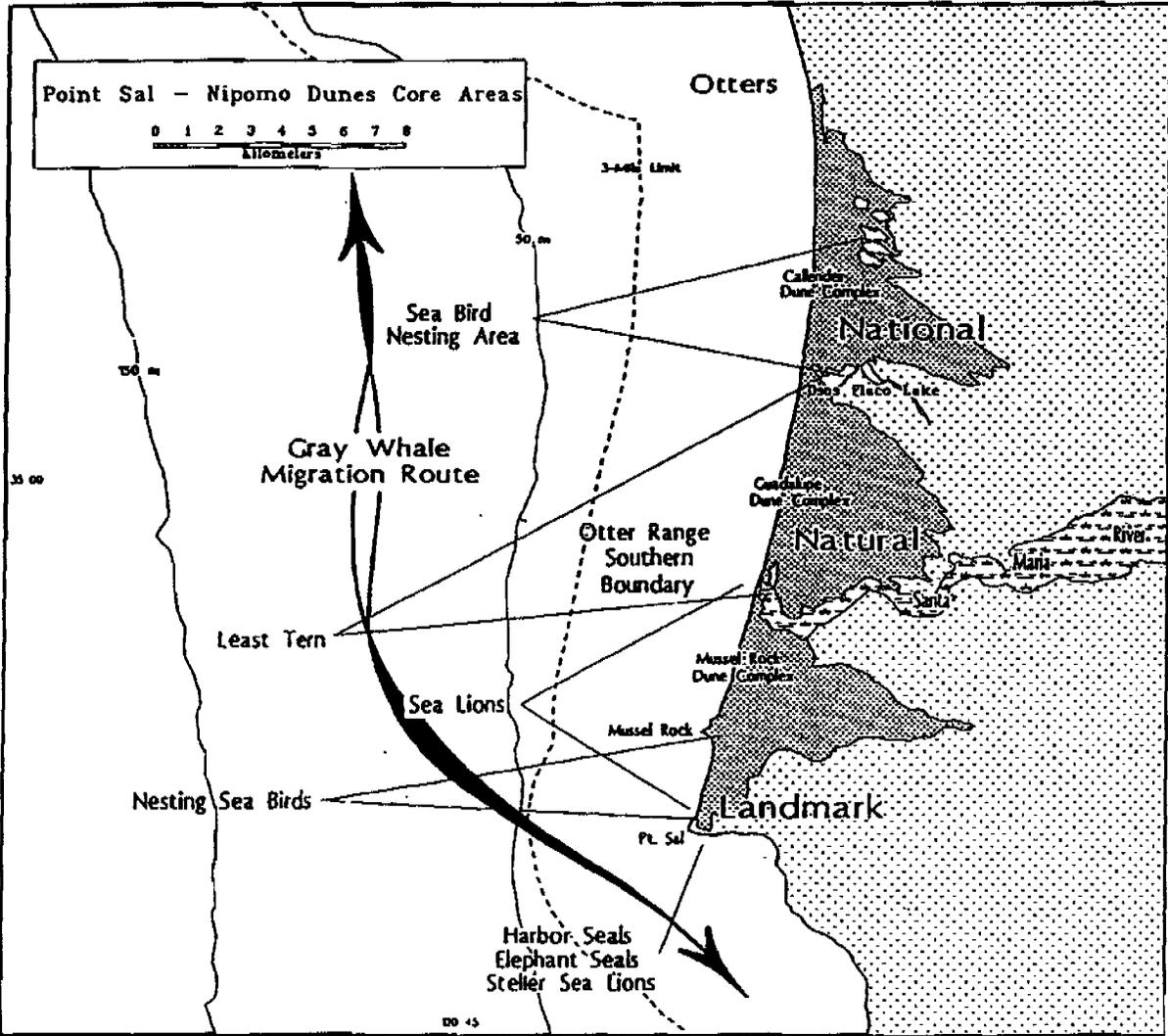
Proposed Central Coast National  
Marine Sanctuary  
- CORE AREAS -

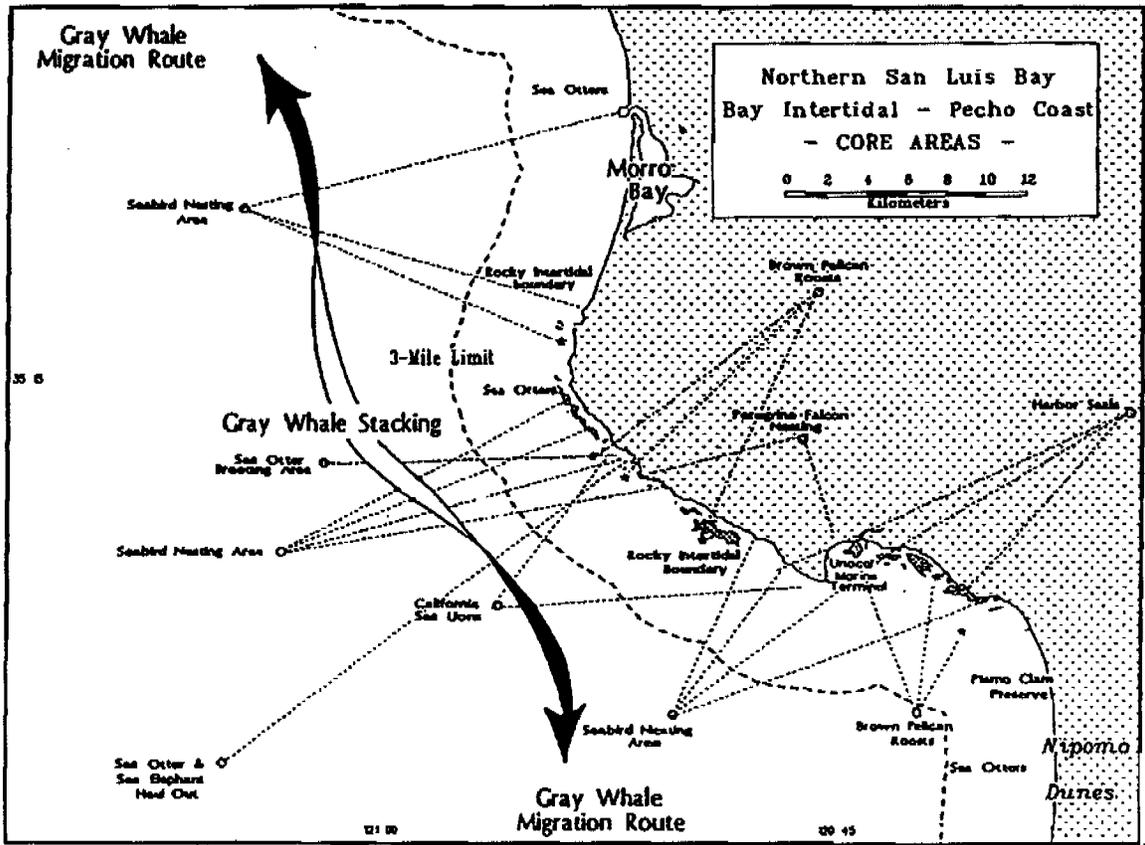
0 5 10 15 20  
Nautical Miles

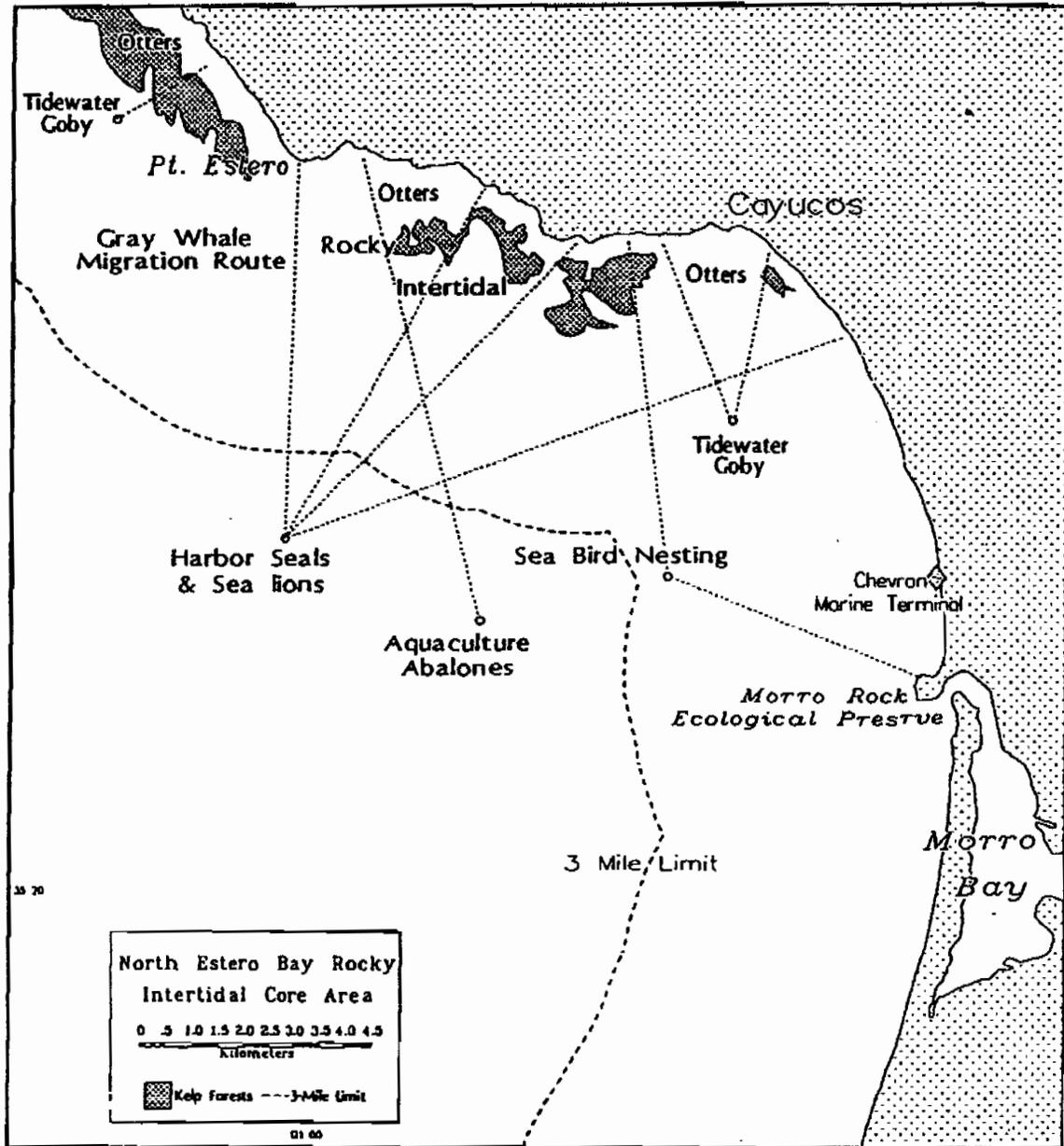
--- SANCTUARY BOUNDARY    ▣ Core Area  
--- 3-Mile Limit            ♦ MARINE TERMINALS

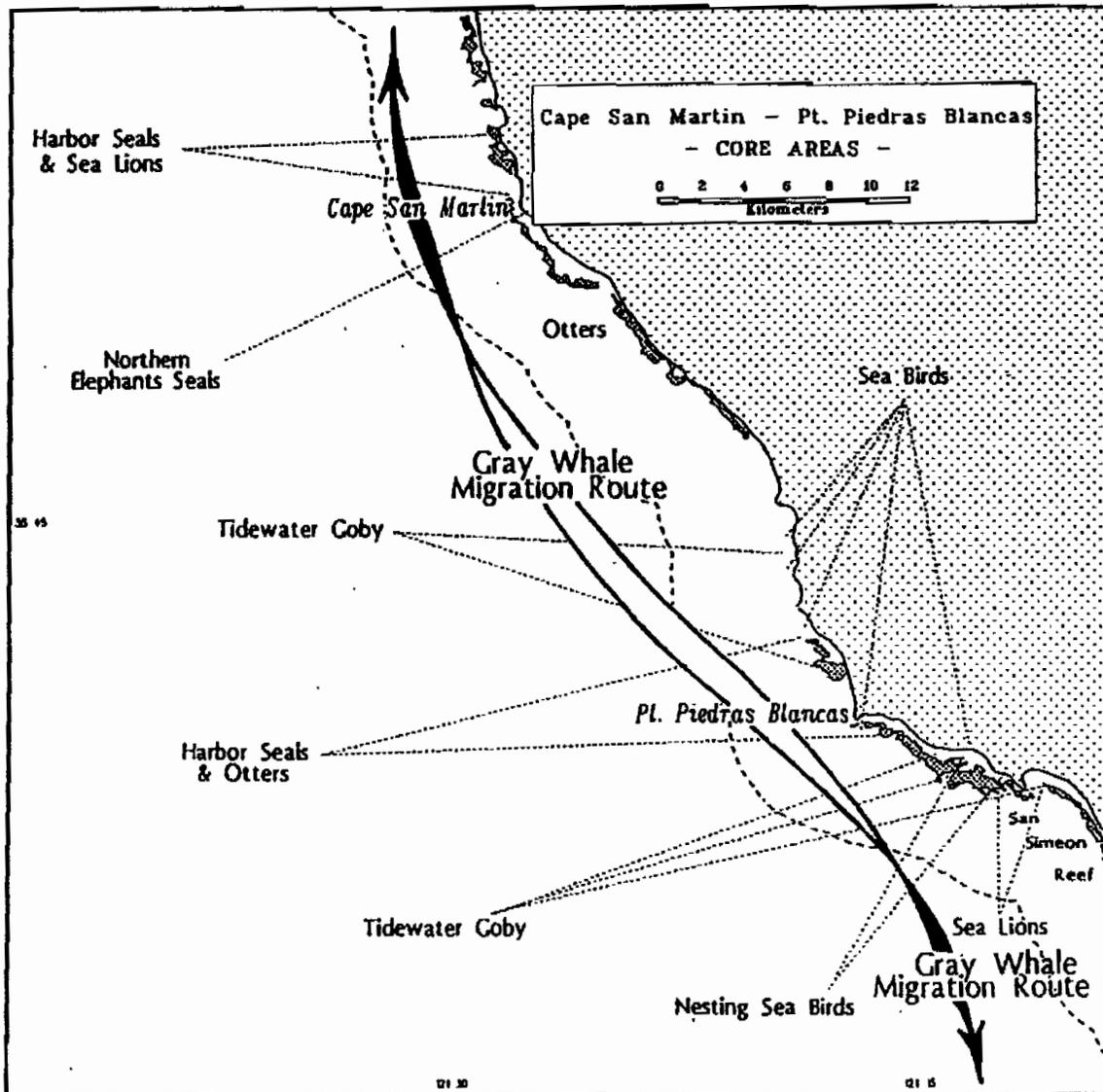
- Core Areas**
- 1 Santa Lucia Bank
  - 2 Point Sal - Nipomo Dunes Complex
  - 3 Northern San Luis Bay Intertidal
  - 4 Morro Bay - Pecho Coast
  - 5 North Eslero Bay Rocky Intertidal
  - 6 Piedras Blancas
  - 7 Cape San Martin
  - 8 Piedras Blancas Outer Waters











**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:13 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 1 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE 3min small Avila Whales.wmv

**From:** Dr. C. Hite [<mailto:aaaptly@gmail.com>]  
**Sent:** Saturday, October 27, 2012 2:52 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 1 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Conscientious objections to further Seismic Study on the Central Coast of California  
by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To whom it may concern;

The most important thing I can show to the California Coastal Commission is a first hand account of the teaming fish and wildlife in sea otter habitat on the Central Coast of California.

It does not matter what I think, feel or know. The only thing that matters is that this was possible and may never be again;

Attached: HITE 3min small Avilla Whales.wmv (video)

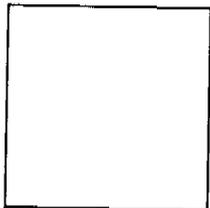
Attached is a three minute uncut film of sea life off Port San Luis Pier in Avila Bay on the Central Coast of California. Avila Beach, California is the location of Diablo Canyon Nuclear Power Plant. Within 3 minutes, a whale or whales surface six (6) times. This is an average of once every 30 seconds. Porpoise and harbor seals can also be seen in this 3 minute video.

I submit that "take" by high energy air cannons in the PG&E Seismic Survey project will not lesson the suffering of marine mammals compared to the "take" by harpoon or clubbing.

The peoples of San Luis Obispo County on the Central Coast of California are and will be most impacted by the Seismic Surveys; designed to support a re-licensing of Diablo Canyon Nuclear Power Plant.

As a PG&E ratepayer, I conscientiously object to further Seismic Study on the Central Coast of California.

#



## **Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:13 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 3 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE 4 18 11 Baywood MB.JPG; HITE 4 18 11 Baywood MB.JPG; HITE Avila Bay 8 31 12.JPG

**From:** Dr. C. Hite [mailto:[aaaptly@gmail.com](mailto:aaaptly@gmail.com)]  
**Sent:** Saturday, October 27, 2012 4:48 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Re: 3 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To whom it may concern;

As a PG&E rate-payer I conscientiously objection to further Seismic Study on the Central Coast of California.

Attached are photographs of sea otter habitat in Los Osos-Baywood Park, Baywood (back bay) - Estero Bay, (Morro Bay), and Avila Bay off the Port San Luis Pier.

The Central Coast of California and our sea otter population is most affected by the PG&E applications for further Seismic Study on the Central Coast. PG&E Diablo Canyon Nuclear Power Plant is located on the Central Coast of San Luis Obispo County.

However, the public of the Central Coast just now have an agenda item set for October 30,2012, to have their voices officially heard by our local representatives. This will be past all important permitting and public comment periods, including; California Department of Fish and Game, National Marine Fisheries, U.S. Fish and Wildlife Services and the California Coastal Commission. Enclosed is the link for official public comments received and posted by the County of San Luis Obispo, on the Central Coast of California. There are many references to habit, food source and marine mammal "take" including the sea otter.

Please include these numerous public comments as part of the California Coastal Commissions consideration of

public comments, as there is a significant amount of research and representation of the true opinions of the stakeholder communities of the Central Coast.

<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1563/SXRlbV9Oby5fMjJfQ29ycmVzcG9uZGVuY2VfUG9zdGVkXzEwLTIzLTEyLnBkZg==/12/n/9692.doc>

<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1563/SXRlbV9Oby5fMjJfQ29ycmVzcG9uZGVuY2VfUG9zdGVkXzEwLTIzLTEyLnBkZg==/12/n/9749.doc>



Official Public Comments from the Central Coast of California web links provided by Dr. C. Hite, Los Osos

#

Reference:

<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1563/SXRlbV9Oby5fMjJfQ29ycmVzcG9uZGVuY2VfUG9zdGVkXzEwLTIzLTEyLnBkZg==/12/n/9692.doc>

Please see that included in my own public comments; 15 Arguments Against Further Seismic Study on the Central Coast that PG&E has a plan in expectation of injury and mortality and expects stranding, including sea otter.

This contradicts the belief that there will be "...no take by injury or death..."

<https://www.federalregister.gov/articles/2012/09/26/2012-23749/marine-mammals-incident-take-during-specified-activities-proposed-incident-harassment#h-4>

"We anticipate no take by injury or death and include none in this proposed authorization, which would be for "take by harassment" only."

#

Attached: 3 jpg files

#

On Sat, Oct 27, 2012 at 3:51 PM, Dr. C. Hite <[aaaptly@gmail.com](mailto:aaaptly@gmail.com)> wrote:  
[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Conscientious objections to further Seismic Study on the Central Coast of California

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To whom it may concern;

**<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1563/SXRlbV90by5fMjJfQ29ycmVzcG9uZGVuY2VfUG9zdGVkXzEwLTlzlTEyLnBkZg==/12/n/9692.doc>**

**RE: 15 Arguments against further seismic testing on the Central Coast of California**

**By Dr. C. Hite, Los Osos, California**

**World Community Workshop**

**(Arguments highlighted in yellow)**

**1) There have been NO scientific studies on the adverse affects on wildlife from the 2011 Seismic testing throughout Los Osos and the County of San Luis Obispo, California.**

**2) There has been no scientific release of data from this 2011 seismic ground testing.**

**3) It would be prudent for PG&E to compile the data from the ground seismic testing first to see if shoreline, estuary and offshore seismic study is necessarily.**

4) PG&E should be required to release the scientific information on the low energy seismic research off portions of the California Central Coast before proceeding with the controversial high decibel seismic study.

<http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/seismic/index.shtml>

## Seismic Studies Update

During the week of August 20, 2012, PG&E will resume low-energy seismic research work off portions of California's Central Coast.

PG&E began the first phase of this low-energy offshore study in 2010, and completed the second portion in 2011. The third phase will study areas near San Luis Bay, Estero Bay and Point Sal.

All operations will be performed during daylight hours and processes and procedures have been implemented to monitor and protect marine mammals while the study is underway.

Mariner and commercial boat traffic are encouraged to remain at least a mile away from the vessel while it operates in the area to avoid entanglement with research equipment. Daily updates on the location of the vessel can be found at [www.marinetraffic.com](http://www.marinetraffic.com) using the search word "Pacific Star."

#

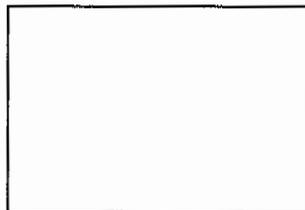
5) Further seismic study should NOT be allowed to proceed without guidelines. NOAA has yet to develop marine mammal acoustic guidelines.

<http://www.nmfs.noaa.gov/>

## Ocean Acoustics

### More on Acoustics

- [Guidelines](#)
- [Shipping Noise](#)
- [Sonar](#)
- [Behavioral Response Studies/ Controlled Exposure Experiments](#)



**Humpback whales**  
(*Megaptera novaeangliae*)  
Photo: R. Wicklund, NOAA

The NOAA Fisheries Acoustics Program is investigating all aspects of marine animal **acoustic communication, hearing**, and the **effects of sound** on behavior and hearing in **protected marine species**. Specifically, the program is:

- Developing acoustic exposure policy for NOAA
  - Developing marine mammal acoustic guidelines
  - Providing technical analysis for NOAA Incidental Take Authorizations and Biological Opinions involving human sound sources based on the best available marine mammal acoustic science
- Supporting research in a variety of areas to address critical data needed to improve and expand these criteria (working directly with NOAA Fisheries Office of Science and Technology)
  - Leading efforts to develop a global passive acoustic noise-monitoring network [pdf] in key marine environments around the world

## More Information

- Cetacean and Sound Mapping Working Groups
- Federal Task Force on Anthropogenic Sound (JSOST 2009) [pdf]
- Shipping Noise
- Sonar
- Behavioral Response Studies/Controlled Exposure Experiments
- NOAA Fisheries
  - Alaska Fisheries Science Center
  - Northeast Fisheries Science Center
  - Northwest Fisheries Science Center
  - Pacific Islands Fisheries Science Center
  - Southeast Fisheries Science Center
  - Southwest Fisheries Science Center
- NOAA VENTS Program
- Stellwagen Bank National Marine Sanctuary
- Learn more about sound

*Updated: October 11, 2012*

#

**6. San Luis Obispo County has NO marine mammal stranding network to report to.**

## Southwest Region Marine Mammal Stranding Network

### California

- NMFS Southwest Regional Office    
Long Beach, CA  
562-980-3230
- NMFS Southwest Fisheries Science Center    
La Jolla, CA  
858-546-7162  
*Dead Cetaceans and Pinnipeds; Sea Turtles*
- California Academy of Sciences    
Department of Ornithology and Mammalogy  
San Francisco, CA  
415-379-5381  
*Dead Cetaceans and Pinnipeds; Sea Turtles*
- California Wildlife Center    
Malibu, CA  
310-458-9453 or 818-222-2658  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Channel Islands Marine & Wildlife Institute    
Goleta, CA  
805-567-1505  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Humboldt State University - Vertebrate Museum    
Arcata, CA  
707-826-4872  
*Dead Cetaceans; Sea Turtles*
- Long Marine Lab, University of California    
Santa Cruz, CA  
831-212-1272  
*Live Cetaceans*  
*Dead Cetaceans and Pinnipeds; Sea Turtles*
- Los Angeles County Museum of Natural History    
Los Angeles, CA  
323-585-5105  
*Dead Cetaceans; Sea Turtles*

- Marine Animal Rescue    
El Segundo, CA  
800-39-WHALE  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Marine Mammal Care Center at Fort MacArthur    
San Pedro, CA  
310-548-5677  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Moss Landing Marine Laboratories    
Moss Landing, CA  
831-771-4422  
*Dead Cetaceans and Pinnipeds; Sea Turtles*
- Northcoast Marine Mammal Center    
Crescent City, CA  
707-465-6265  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Pacific Marine Mammal Center    
Laguna Beach, CA  
949-494-3050  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Santa Barbara Marine Mammal Center    
Santa Barbara, CA  
805-687-3255  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- Santa Barbara Museum of Natural History    
Vertebrate Laboratory  
Santa Barbara, CA  
805-682-4711 x156  
*Dead Cetaceans; Sea Turtles*
- SeaWorld    
San Diego, CA 92109  
800-541-7325  
*Live Cetaceans and Pinnipeds; Sea Turtles*
- The Marine Mammal Center    
Sausalito, CA  
415-289-7350  
*Live Cetaceans and Pinnipeds; Sea Turtles*

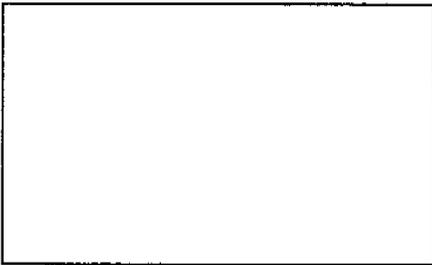
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7) The nitrogen hot fertilizer of organic flotsam from the seismic study "take" will clog the cooling water intake of Diablo Canyon Nuclear Power Plant, making it unreliable.

<http://www.pgecurrents.com/2012/04/27/san-luis-obispo-county-diablo-canyon-powers-down-after-sea-salp-migration/>

Posted on April 27, 2012

## San Luis Obispo County: Diablo Canyon Powers Down after Sea Salp Migration



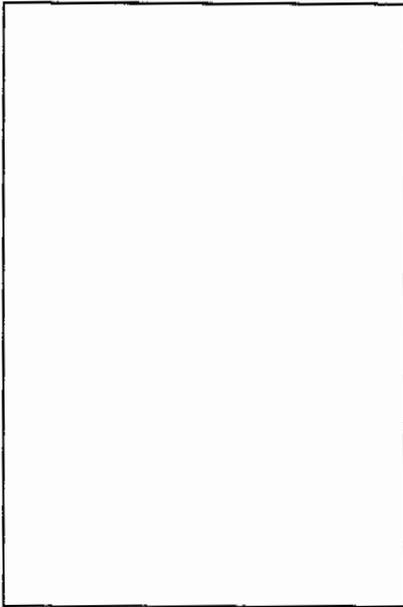
Diablo Canyon Power Plant in San Luis Obispo County

**AVILA BEACH** – PG&E has powered down Unit 2 at its Diablo Canyon Power Plant after a migration of small jellyfish-like creatures known as sea salps.

As reported by the *San Luis Obispo Tribune*, southerly winds began blowing the salps into the plant's cooling water intake cove on Tuesday. Plant operators noticed differences in water pressure at the intake structure, which meant the salps were beginning to clog the rolling screens in front of the intake.

After initially reducing power in Unit 2 to 15 percent, the problem with the animals first got better and then got worse. So, on Wednesday, the decision was made to fully power down the plant.

"I've been very pleased with how staff has reacted to this by putting safety first," Ed Halpin, PG&E's chief nuclear officer, told the newspaper.



Small jellyfish-like creatures called sea salps are in the water near Diablo Canyon.

Millions if not billions of sea salps, a one- to three-inch long transparent barrel-shaped animal that looks and feels much like a jellyfish, came ashore in the area with onshore currents. These creatures feed on plankton, and multiply rapidly.

The plant will return to full power as soon as it is safe to do so, and conditions warrant, Halpin said.

John Lindsey, a PG&E spokesman and meteorologist based in San Luis Obispo, said Friday that the winds have now changed direction in the area, and the salps should begin heading out to sea.

The Diablo Canyon intake provides seawater for cooling. It is 240-feet long, 100-feet wide and 18-feet high. It extends down 32 feet below sea level. The intake structure is backfilled by rock on three sides, and has water on the fourth (western) side.

The intake relies on four, 13,000-horsepower electric motors to pump 1.7 million gallons per minute or up to 2.5 billion gallons per day. In other words, the circulating water system provides the heat sink required for removal of waste heat in the power plant's thermal cycle. The circulating water system is designed to provide cooling water necessary to condense the steam entering the main condenser.

A curtain wall at the front of the intake structure limits the amount of floating debris entering the intake structure. Bar racks near the front of the intake structure intercept large submerged debris. Traveling screens intercept all material larger than the screen mesh opening, which measure  $\frac{3}{8}$ ths of an inch.

The intake also houses the Auxiliary Salt Water (ASW) pumps. The ocean water supply to the ASW system provides the cooling and heat absorption capability required to remove waste heat under normal and emergency conditions.

The two units of Diablo Canyon produce approximately 2,300 net megawatts of greenhouse-gas-free electricity, about 10 percent of all electricity generated in California. That's enough to meet the needs of over three million homes in central and northern California. Unit 1 at the nuclear power plant was shut down for refueling starting on April 23.

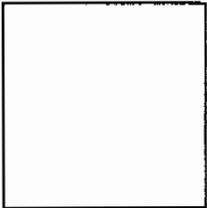
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**8) PG&E will be acting against it's own stated commitment to the "environment" for the purpose of extending the license of the Diablo Canyon Nuclear Power Plant.**

<https://mail.google.com/mail/?shva=1#drafts/13a65f7cf279a230>

### **PG&E's Environmental Commitment**

At PG&E, we are committed to being an environmental leader and demonstrating this through our actions. We pledge to think creatively, work cooperatively and be results-oriented in our environmental stewardship efforts.



#

**9) PG&E Diablo Canyon Nuclear Power Plant is aged, scheduled for decommission and is unreliable**

[http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/pressrelease/archive/unit\\_2\\_at\\_pgcs\\_diablo\\_canyon\\_power\\_plant\\_safely\\_shut\\_down\\_following\\_electrical\\_disturbance.shtml](http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/pressrelease/archive/unit_2_at_pgcs_diablo_canyon_power_plant_safely_shut_down_following_electrical_disturbance.shtml)

## **Unit 2 at PG&E'S Diablo Canyon Power Plant Safely Shut Down Following Electrical Disturbance**

October 11, 2012

**AVILA BEACH, Calif.** – Unit 2 at Pacific Gas and Electric Company's (PG&E) Diablo Canyon Power Plant safely shut down as designed at 12:08 p.m. today after an electrical disturbance occurred in equipment that moves power to the state's electric grid. Unit 1 continues to safely generate power.

Plant operators responded to the shutdown according to procedures and are working to determine the cause of the incident. The unit remains in a safe condition and will be restored to service after the cause is fully understood and the equipment is fully tested.

PG&E has informed the U.S. Nuclear Regulatory Commission and appropriate local and state officials.

Pacific Gas and Electric Company, a subsidiary of PG&E Corporation (NYSE:PCG), is one of the largest combined natural gas and electric utilities in the United States. Based in San Francisco, with 20,000 employees, the company delivers some of the nation's cleanest energy to 15 million people in Northern and Central California. For more information, visit <http://www.pge.com/about/newsroom/> and [www.pgecurrents.com](http://www.pgecurrents.com).

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<http://marinelife.about.com/od/conservation/a/sonarCA.htm>

#

**10) The Central Coast rate payers had NO vote on paying for the seismic study and have NO vote to shut the plant down as did the Sacramento rate payers.**

<http://www.energy-net.org/01NUKE/RSECOT.HTM>

## **The History of Rancho Seco**

### **1966-1969**

SMUD purchases 2,100 acres in southeast Sacramento County for a nuclear power plant. Construction begins on the cooling towers.

### **1971**

- SMUD raises rates...even though Rancho Seco hasn't produced a single kilowatt-hour of electricity.
- The day Rancho Seco is dedicated there is a forced shutdown of the reactor (unknown to those attending the dedication ceremony)... a portent of things to come. [10/19/74]
- The turbine breaks down. The plant is shut down for 13 of the first 18 months of operation.

### **1976**

- Loose parts are found in Rancho Seco's generator. SMUD says the find "will not cause any additional lost time." The plant is down for six months. [4/9/76, SB ]

### **1978**

- Rancho Seco shuts down four times. Problems are due to a dangerously fast cooldown.

### **1979**

- Radioactive iodine is found in milk from cows grazing near Rancho Seco. [Quarterly Radiation Report on Rancho Seco ]

### **1980**

- Rancho Seco shuts down six times. Problems occurred with pipe supports, reactor coolant leaks, malfunctions, turbine bearings and feedwater flow. [9/26/83, SU ]
- SMUD is fined \$25,000 by the NRC for violating federal safety standards.

### **1981**

- A state report on emergency planning estimates that a serious nuclear accident at Rancho Seco could result in as many as 76,000 deaths and 110,000 injuries. [11/2/80, SB ]
- Rancho Seco shuts down 12 times. Problems are due to steam generator tube leaks, feedwater, reactor coolant pump and turbine vibrations. [9/26/83, SU ]

## 1982

- Rancho Seco shuts down 11 times, due to problems with the turbine, steam leaks, oil pressure and reactor trips. [9/26/83, SU ]
- SMUD is fined \$120,000 for violating federal safety regulations.
- The steam generator leaks again...more radioactive steam escapes. Another shut-down.

## 1983

- Rancho Seco shuts down five times, due to maintenance, re-fueling, modifications, oil pressure in turbine generator, heat imbalance in reactor and leak in steam generator tube. [9/26/83, SU ]
- The steam generator tubes leak again and more radioactive steam escapes into the atmosphere. The plant is shut down again.
- SMUD faces a lack of skilled workers for Rancho Seco. [3/6/83, SB]

## 1984

- Rancho Seco is on the NRC's list of the ten worst nuclear plants in the U.S. in overall assessment of management performance. [3/28/89, Public Citizens Mishaps Report, NRC ]
- More than two billion gallons of water containing radiation levels above federal guidelines have been dumped from Rancho Seco into a creek that feeds the Cosumnes and Mokelumne Rivers, SMUD officials confirmed. [4/14/84, SB ]
- Two workers are killed by high-pressure steam bursting from a boiler at Rancho Seco.
- An explosion and fire shut down Rancho Seco for 38 days.

## 1985

- SMUD raises rates twice...by nearly 30 percent. SMUD has the first budget deficit in its history. From January 1, 1985 to March 31, 1988, Rancho Seco operates only three months (out of three and one-quarter years).
- On December 26, Rancho Seco suffers the third-fastest shut-down in U.S. reactor history when a control circuit malfunctions. The sudden temperature change could have cracked the reactor vessel and led to a meltdown.
- SMUD customers are now paying 40 percent more than a year ago. Rancho Seco work is \$27 million over budget and another rate increase is being considered.

## 1986

- Sacramentoans for SAFE Energy (SAFE) calls for the SMUD board of directors to commission an independent, comprehensive study of the safety and economic risks associated with Rancho Seco as well as a comparison of alternative means of meeting our energy needs.

- Rancho Seco assistant manager for nuclear operations Dan Whitney said plant managers sometimes deliberately withheld information about system shortcomings when questioned by the NRC. [5/22/86, SB ]
- SMUD admits that Rancho Seco was "mismanaged, mismaintained and misoperated" its entire lifetime. [5/20/86, SB ]
- Two Rancho Seco workers are fired for drug abuse. They claim there is drug abuse throughout the plant.

## 1987

- wo water leaks lead to the release of approximately 10,000 gallons of radioactive water, some of it flowing into the nearby creek, outside of the plant's boundaries...[3/28/89, Public Citation of Mishaps, NRC ]
- In 1987, SMUD pays more than \$350,000 in cash bonuses to fill positions at Rancho Seco. [7/10/88, SB ]
- "Rates have increased 84 percent since March 1985, leading to ratepayer dismay and a situation in which half of SMUD households pay more than if served by surrounding Pacific Gas and Electric Company. " [10/23/87, SB ]
- Chief of nuclear operations, John Ward, is fired despite reputation as a fixer of hopeless cases."It was like being in charge of the Keystone Kops," says Ward. [9/23/86]

## 1988

- "Closing Rancho Seco is the option for the future of SMUD that makes the most sense." [3/2/88, Sacramento Bee Editorial Staff ]
- "The never-ending series of mishaps are beginning to look like a very high-budget Marx Brothers film, with Harpo in charge of warning the city should there be an emergency." [2/19/88, TV 40 Editorial Comment ]
- A SMUD-commissioned, \$824,000 QUEST study team recommends closure of Rancho Seco, saying that unstable operation of Rancho Seco could bankrupt SMUD.
- Rancho Seco operates at less than 37%--even less than its lifetime capacity average of 39%. Rates have increased almost 92% since March 1985 due to Rancho Seco problems. [INPO ]
- The October 1988 SMUD bond prospectus states, "The District has concluded that terminating Rancho Seco in June 1989 would not have a materially adverse impact on the District's operations through December, 1999." [SMUD ]
- Measure B (to close Rancho Seco) loses on the June ballot by the narrowest of margins--only two votes per precinct. Measure C (to give Rancho Seco a trial run) barely passes.
- Rancho Seco supporters promise stability and low electric rates for SMUD. However, immediately following the June 1988 election, SMUD General Manager Richard Byrne is fired, Rancho Seco chief of nuclear operations resigns and SMUD discloses the need for additional rate increases. Two SMUD chiefs get \$520,000 in severance pay and bonuses.
- Former SMUD general manager Richard Byrne said he was "stifled, pressured and threatened by pro-Rancho Seco board members who wanted to keep potentially damaging information from reaching the public before the June 7, 1988 election. [6/18/88, SB ]
- SMUD gives out \$248,500 in bonuses to middle- and upper-level employees in May for "extraordinary service." About 80 percent (\$197,000 was awarded to Rancho Seco managers and the balance to employees at SMUD headquarters. [9/1/88,SB]
- SMUD secretly paid out more than 970,000 in cash and benefits to eight managers who were forced to leave the utility during the past two years. [11/17/88, SB ]
- Operating Rancho Seco in 1988 cost nearly twice the amount it would have cost SMUD to have purchased the same amount of electricity from other utilities. [12/26/88, SU ]

- December 12--Operators try to restart Rancho Seco with malfunctioning valves. They rig the system in a manner for which there are no written procedures. One of two steam generators runs dry. NRC officials say operators took the plant through "uncharted waters" and showed poor judgment in handling the restart.

## 1989

- On January 31 Rancho Seco shuts down. Two days later, radioactive gas is released into the environment. The plant is down for 45 days. Bill Chapin, Rancho Seco plant mechanical maintenance supervisor and co-chairman of the Rancho Seco Political Action Committee says, "I think there's no doubt, the Ranch cannot have another breakdown between now and June, politically speaking." A day after his quote, Rancho Seco goes down yet another time. [3/28/89, SB ]
- SMUD and PG&E contract ensures cheap, reliable power for Sacramento through 1999. [2/27/89, SU ]
- The nuclear industry's own Institute of Nuclear Power Operations prepares a report on the recent shutdowns at Rancho Seco, saying that Rancho Seco's prior operating history as well as recent shutdowns "cause us to have a renewed concern over the quality of Rancho Seco operations." [INPO]
- SMUD pays \$1,230 for one Rancho Seco employee's clothing as part of the "distinctive attire" program. Jackets, pants, shirts and ties have already cost \$72,000; laundry bills, \$2,500 a month--all ultimately paid by the ratepayers.
- The plant comes to an abrupt halt (is scrambled) on the 10th anniversary of the Three Mile Island meltdown. High-level radioactive gasses are vented to the atmosphere. On April 8 the reactor is started, even though the cause of the March 28 accident has not been found and malfunctioning equipment (from the March 15 accident) has not been repaired. [3/29/89, SB, SU ]
- June 6th, 1989 Sacramento Citizens go to the polls and vote to permanently close Rancho Seco.

Sources: SB: Sacramento Bee, SU Sacramento Union xxx The above was a poster created for Measure K on June 6, 1989

#

### **11) Continued seismic study is specific to "ensuring that Diablo Canyon continues" by not just extending the life span but providing an "after life" to Diablo Canyon Nuclear Power Plant**

<http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/seismic/index.shtml>

## **Seismic Information**

### **Seismic Safety**

PG&E remains focused on ensuring that Diablo Canyon continues, and improves upon, its strong record of safe operations. This includes making the facility resilient to natural hazards, including earthquakes and tsunamis.

PG&E is the only utility in the country that employs a seismic department staffed with experts. The scientific staff continually studies earthquake faults in the region of the power plant and global seismic events as part of the plant's comprehensive safety program.

In November 2008, the U.S. Geological Survey (USGS), working in partnership with PG&E's geosciences department, discovered a new shoreline fault zone, and PG&E evaluated whether that new feature presented a safety risk to the plant. PG&E submitted its evaluation to the Nuclear Regulatory Commission (NRC) under the

commitment of its current operating licenses. PG&E's evaluation confirmed the plant has adequate safety margin to withstand maximum ground motions postulated to occur from faults in the region, including the shoreline fault.

## Advanced Seismic Research

PG&E is currently conducting advanced seismic studies that will provide a more accurate and detailed picture of the region's complex geology. The research, called for by the state, will help further define the amount of ground motions that seismic faults in the region are capable of producing.

PG&E has made steady progress toward completing the studies since the research began in 2010. The on-shore work is nearly complete, the majority of the low-energy off-shore studies are finished, and the California Coastal Commission has approved PG&E's request to install ocean-bottom seismometers to detect seismic activity.

The company plans to undertake the final, off-shore high-energy study as soon as it obtains all necessary permits from various regulatory agencies, including the State Lands Commission, California Coastal Commission and County of San Luis Obispo. To address public concern regarding the seismicity of the area surrounding Diablo Canyon, PG&E has worked to expedite the permitting process so it can begin this study as soon as possible. PG&E is committed to conducting this work safely and in a manner with the least impact to the community and the environment.

Once the research is complete, PG&E will use the data to support its ongoing work to continually assess and validate the seismic design of the plant. PG&E will also share information collected with local public and government agencies so they can incorporate it into emergency preparedness plans and ensure the safety of critical infrastructure. The data will also be used to support federal requirements for new seismic risk evaluations following the Fukushima Daiichi power plant tragedy in Japan.

## Seismic Studies Update

During the week of August 20, 2012, PG&E will resume low-energy seismic research work off portions of California's Central Coast.

PG&E began the first phase of this low-energy offshore study in 2010, and completed the second portion in 2011. The third phase will study areas near San Luis Bay, Estero Bay and Point Sal.

All operations will be performed during daylight hours and processes and procedures have been implemented to monitor and protect marine mammals while the study is underway.

Mariner and commercial boat traffic are encouraged to remain at least a mile away from the vessel while it operates in the area to avoid entanglement with research equipment. Daily updates on the location of the vessel can be found at [www.marinetraffic.com](http://www.marinetraffic.com) using the search word "Pacific Star."

## Seismic Information

- [August 2012 Status Report to ASLB on Seismic Studies](#) (PDF, 83 KB)
- [July 2012 Status Report to ASLB on Seismic Studies](#) (PDF, 83 KB)
- [June 2012 Status Report to ASLB on Seismic Studies](#) (PDF, 83 KB)
- [May 9, 2012 Status Report to ASLB on Seismic Studies](#) (PDF, 83 KB)

- [May 8, 2012 Status Report to ASLB on Seismic Studies \(PDF, 83 KB\)](#)
- [April 2012 Status Report to ASLB on Seismic Studies \(PDF, 83 KB\)](#)
- [March 2012 Status Report to ASLB on Seismic Studies \(PDF, 81 KB\)](#)
- [February 2012 Status Report to ASLB on Seismic Studies \(PDF, 83 KB\)](#)
- [January 2012 Status Report to ASLB on Seismic Studies \(PDF, 82 KB\)](#)
- [December 2011 Status Report to ASLB on Seismic Studies \(PDF, 81 KB\)](#)
- [November 2011 Status Report to ASLB on Seismic Studies \(PDF, 83 KB\)](#)
- [October 2011 Status Report to ASLB on Seismic Studies \(PDF, 92 KB\)](#)
- [September 2011 Status Report to ASLB on Seismic Studies \(PDF, 91 KB\)](#)
- [August 2011 Status Report to ASLB on Seismic Studies \(PDF, 91 KB\)](#)
- [July 2011 Status Report to ASLB on Seismic Studies \(PDF, 98 KB\)](#)
- [PG&E High Energy 3-D Seismic Scoping Presentation Before the State Lands Commission](#)
- [California Coastal Commission's Report on DCPD Safety From Tsunamis and Earthquakes \(PDF, 661 KB\)](#)
- [NRC releases post-Fukushima 90 day report \(PDF, 899 KB\)](#)

## Seismic Survey Topics

[NRC Related Correspondence](#)

[Ocean Bottom Seismometer Study](#)

[2D/3D Low Energy Marine Studies](#)

[3D High Energy Marine Studies](#)

[Fishing Reading Room](#)

## Diablo Canyon Newsroom

- [Unit 2 at PG&E'S Diablo Canyon Power Plant Safely Shut Down Following Electrical Disturbance](#)
- [PG&E to Submit Modified Seismic Study Proposal to California Coastal Commission](#)
- [PG&E Names New Diablo Canyon Site Vice President](#)
- [PG&E Supports Cal Poly Athletics with \\$20,000 Donation](#)
- [View all News Releases](#)

## Articles and Perspectives About Diablo Canyon

[San Luis Obispo County: PG&E Taking Extensive Measures to Protect Marine Life in Seismic Testing](#)

[Trails Near Diablo Canyon Plant Offer Stunning Views of Coastal Scenery](#)

[San Luis Obispo County: State Lands Commission Approves Seismic Testing](#)

[San Luis Obispo County: Delano Students Get an Insider's View of Diablo Canyon Power Plant](#)

[San Luis Obispo County: Diablo Canyon Powers Down after Sea Salp Migration](#)

[View all articles](#)


#

**12) We have NO comparisons to see if similar testing by oil companies have used this "similar testing" safely because not all have taken the same "multi-tiered monitoring program" approach.**

<http://www.pgecurrents.com/2012/09/07/san-luis-obispo-county-pge-taking-extensive-measures-to-protect-marine-life-in-seismic-testing/>

With PG&E seeking approvals to conduct the final high-energy study, concerns have been raised about the affect the survey's high-decibel sounds will have on marine life. PG&E is mindful of these concerns, Strickland said, and is making every effort to mitigate potential impacts.

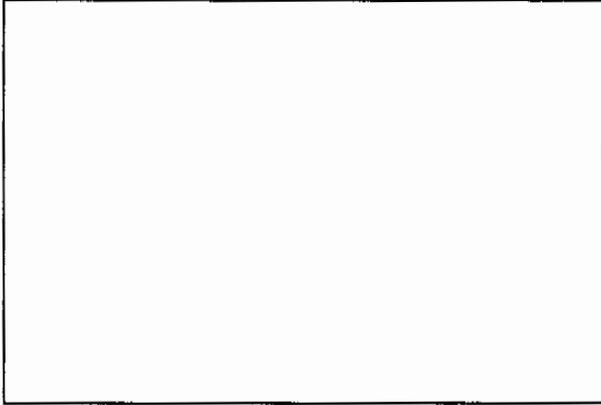
Other companies – including those in the oil industry — have used similar testing safely, he said. However, he said not all have taken the same “multi-tiered monitoring program” approach that PG&E has planned to protect marine life.

#

**13) There is insufficient scientific data to determine if the "ramping up" of sound to full power will drive marine mammals into the many coves off the Central Coast and aground.**

<http://www.pgecurrents.com/2012/09/07/san-luis-obispo-county-pge-taking-extensive-measures-to-protect-marine-life-in-seismic-testing/>

We are going above and beyond what other companies have implemented to date," he said.



PG&E continues to take many steps to ensure and improve the safety of its Diablo Canyon Power Plant.

For example, before a survey track begins, a single air gun will sound at a low-level to warn marine life before ramping up to full power. The air gun sound will be managed or reduced based on the proximity of marine mammals to the survey boat. During the survey, a 180-decibel exclusion zone, and an even larger 160-decibel safety zone, will be established around the boat for the protection of marine mammals. The zones were established with help from the National Marine Fisheries Services.

#

**14) PG&E expects that there will be marine mammal stranding.**

Draft Stranding Response, diablo Canyon, California (PDF Attached)

#

**15) Diablo Canyon Nuclear Power Plant is NOT required to protect the "Nation."**

<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=beached+mammals+from+seismic+testing>

# U.S. Navy Allowed to Use Sonar That May Harm Whales

## Supreme Court Rules in Favor of U.S. Navy

By [Jennifer Kennedy](#), About.com Guide

See More About:

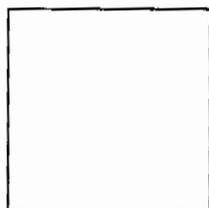
- [whales](#)
- [cetaceans](#)
- [conservation](#)
- [sonar](#)

Updated January 16, 2009

In a case of national security once again trumping the environment, the U.S. Supreme Court ruled on November 12, 2008 that the U.S. Navy could continue using high-powered sonar as part of its training exercises, possibly at the expense of [whales](#) and other marine mammals. This decision was made in a case of the [Natural Resources Defense Council \(NRDC\)](#) versus the Navy regarding the Navy's use of sonar in training exercises in southern California. The sonar is used to detect enemy ships, and the Navy argued that the sonar is needed to effectively train and protect the nation.

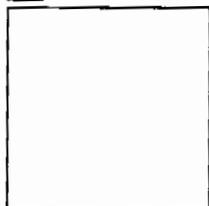
The decision overturns one made earlier in the year by a federal judge in Los Angeles that was upheld by a U.S. Court of Appeals in San Francisco that required the Navy to suspend the use of sonar if it detected a marine mammal within 2,200 yards, and when sea conditions allowed the sonar to travel farther than usual.

# # # # #



[pge2012\\_diablocanyon\\_stranding\\_response\\_draft.pdf](#)  
135K [View](#) [Download](#)

YouTube - Videos from this email



# **RE: 15 Arguments against further seismic testing on the Central Coast of California**

**By Dr. C. Hite, Los Osos, California**

## **World Community Workshop**

**(Arguments highlighted in yellow)**

- 1) There have been NO scientific studies on the adverse affects on wildlife from the 2011 Seismic testing throughout Los Osos and the County of San Luis Obispo, California.**
- 2) There has been no scientific release of data from this 2011 seismic ground testing.**
- 3) It would be prudent for PG&E to compile the data from the ground seismic testing first to see if shoreline, estuary and offshore seismic study is necessarily.**
- 4) PG&E should be required to release the scientific information on the low energy seismic research off portions of the California Central Coast before proceeding with the controversial high decibel seismic study.**
- 5) Further seismic study should NOT be allowed to proceed without guidelines. NOAA has yet to develop marine mammal acoustic guidelines.**
- 6. San Luis Obispo County has NO marine mammal stranding network to report to.**
- 7) The nitrogen hot fertilizer of organic flotsam from the seismic study "take" will clog the cooling water intake of Diablo Canyon Nuclear Power Plant, making it unreliable.**
- 8) PG&E will be acting against it's own stated commitment to the "environment" for the purpose of extending the license of the Diablo Canyon Nuclear Power Plant.**
- 9) PG&E Diablo Canyon Nuclear Power Plant is aged, scheduled for decommission and is unreliable**

**10) The Central Coast rate payers had NO vote on paying for the seismic study and have NO vote to shut the plant down as did the Sacramento rate payers.**

**11) Continued seismic study is specific to "ensuring that Diablo Canyon continues" by not just extending the life span but providing an "after life" to Diablo Canyon Nuclear Power Plant**

**12) We have NO comparisons to see if similar testing by oil companies have used this "similar testing" *safely* because not all have taken the same "multi-tiered monitoring program" approach.**

**13) There is insufficient scientific data to determine if the "ramping up" of sound to full power will drive marine mammals into the many coves off the Central Coast and aground.**

**14) PG&E expects that there will be marine mammal stranding.**

**15) Diablo Canyon Nuclear Power Plant is NOT required to protect the "Nation."**

**<http://www.pge.com/myhome/edusafety/systemworks/dcpp/newsmedia/seismic/index.shtml>  
<http://marinelife.about.com/od/conservation/a/sonarCA.htm>Error! Filename not specified.**

#

On Sat, Oct 27, 2012 at 2:51 PM, Dr. C. Hite <[aaaptly@gmail.com](mailto:aaaptly@gmail.com)> wrote:  
[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

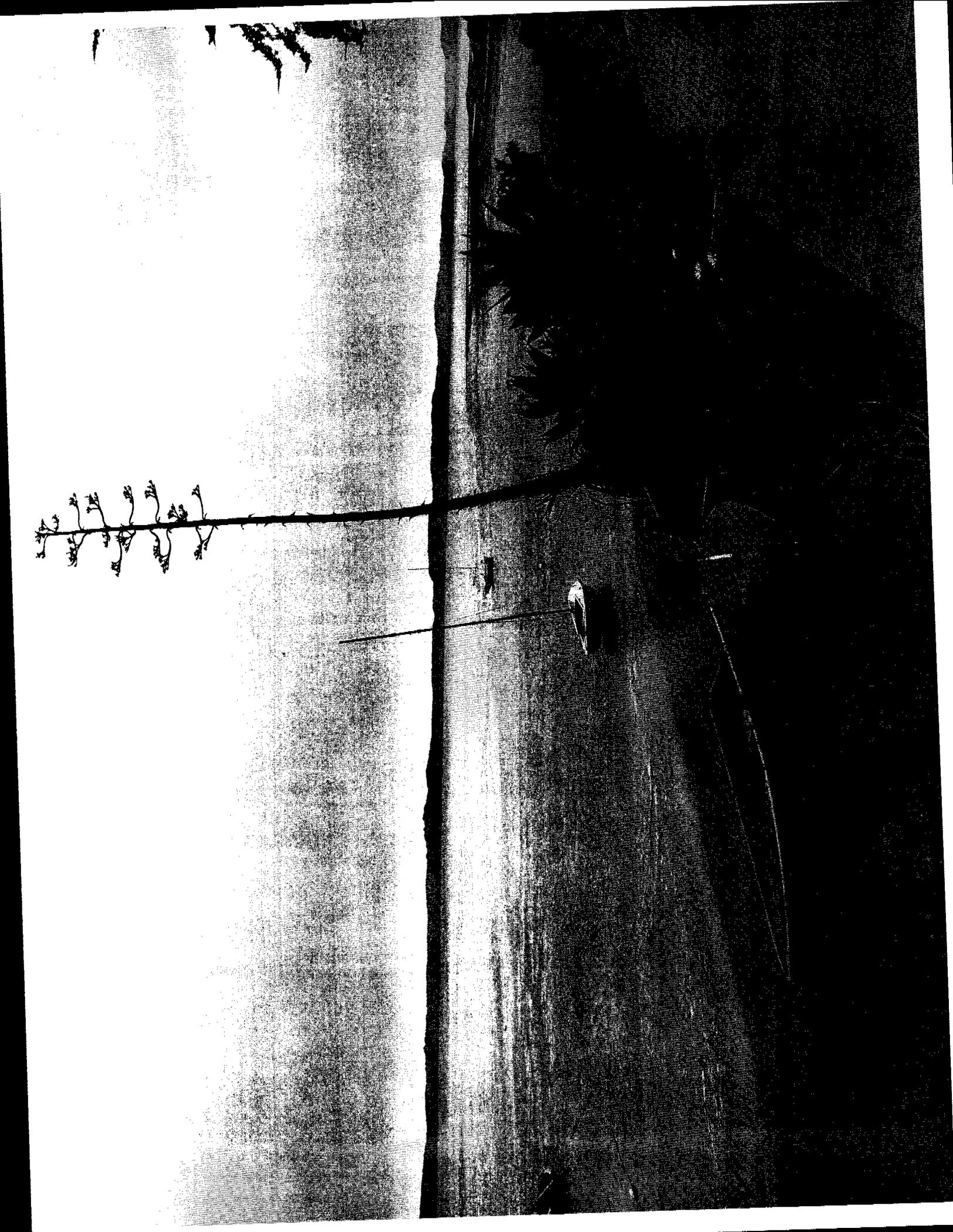
California Coastal Commission

RE: Conscientious objections to further Seismic Study on the Central Coast of California  
by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
805 5341232

To whom it may concern;

The most important thing I can show to the California Coastal Commission is a first hand account of the teaming fish and wildlife in sea otter habitat on the Central Coast of California.





**DRAFT Stranding Response Plan**

It does not matter what I think, feel or know. The only thing that matters is that this was possible and may never be again;

Attached: HITE 3min small Avila Whales.wmv (video)

Attached is a three minute uncut film of sea life off Port San Luis Pier in Avila Bay on the Central Coast of California. Avila Beach, California is the location of Diablo Canyon Nuclear Power Plant.

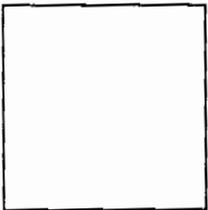
Within 3 minutes, a whale or whales surface six (6) times. This is an average of once every 30 seconds. Porpoise and harbor seals can also be seen in this 3 minute video.

I submit that "take" by high energy air cannons in the PG&E Seismic Survey project will not lessen the suffering of marine mammals compared to the "take" by harpoon or clubbing.

The peoples of San Luis Obispo County on the Central Coast of California are and will be most impacted by the Seismic Surveys; designed to support a re-licensing of Diablo Canyon Nuclear Power Plant.

As a PG&E ratepayer, I conscientiously object to further Seismic Study on the Central Coast of California.

#



issued by NMFS and USFWS in the event that marine mammal strandings are detected within the seismic study zone during or following the seismic testing. NMFS and USFWS will consider all plausible causes within the course of a stranding investigation, and the development of this plan in no way presumes that any strandings are related to, or caused by, the seismic testing conducted by PG&E, unless and until a determination is made following a Stage 2 investigation as outlined in this plan.

## **Stranding Network**

### *Pinnipeds and Cetaceans*

Response to stranded pinnipeds and cetaceans in California is conducted by members of the California Marine Mammal Stranding Network. There are two stranding network response groups authorized by NMFS for this geographic area. For live animals (primarily pinnipeds, but live cetacean triage and stabilization), the authorized response group is The Marine Mammal Center (TMMC), which has its main campus in the Marin Headlands north of San Francisco, but which maintains a satellite facility in Morro Bay (TMMC-SLO), approximately 45 minutes north of Avila Beach. Rehabilitation of live cetaceans would occur in Santa Cruz, San Diego, or Sausalito (typically a single cetacean each; multiple pinnipeds would be rehabilitated in Sausalito).

The authorized response group for dead cetacean response is the Santa Barbara Museum of Natural History (SBMNH), located in Santa Barbara, which is approximately 2 hours south of Avila Beach. Both groups operate primarily with volunteers with only a few (or 1) paid staff member, and typically handle minimal case loads during this time of year (see Appendix 1 for historical stranding information). Neither organization is well equipped for a drastic increase in the number of stranded animals, particularly with the distances involved to respond to each stranded animal. In addition neither organization has an active beach or near shore surveillance programs. No organization is responsible for assessment of dead pinnipeds, and most of the dead stranded pinnipeds are not examined.

These network participants also work collaboratively with other agencies throughout the region; for example, CDFG personnel in the Morro Bay have historically assisted with pinniped and cetacean strandings, and may be able to provide boat and/or vehicle access to difficult to reach locations during this timeframe.

### *Sea Otters*

The CDFG and the U. S. Geological Survey (USGS) have intensively monitored and studied southern sea otter strandings along the Central California coast for over 40 years. An attempt is made by these groups to verify, examine, and/or collect every stranded sea otter. Under the existing program, dead stranded sea otters are either field necropsied by an experienced CDFG or USGS biologist or collected and examined by a veterinary pathologist at the CDFG Marine Wildlife Veterinary Care and Research Center (MWVCRC) in Santa Cruz. Live stranded sea otters (in the PG&E project area) are collected by the CDFG and/or TMMC and are transferred to the Monterey Bay Aquarium's Sea Otter Research and Conservation (MBA) program for evaluation, care and possible rehabilitation.

## **MARINE MAMMAL STRANDING RESPONSE AUGMENTATION**

### **Personnel Requirements**

To augment local response capabilities, a 2-person trained team (rotating through for two week periods) will be staged on the coast in the geographic area of the proposed seismic survey area. They will rapidly respond to reports of stranded animals and arrange further treatment/assessment/sampling. These teams would receive any reports of strandings (floaters, nearshore or on beach) from the aerial survey teams, the public (via established stranding network hotlines; Appendix 2), or other sources. Notification of strandings would be given following the Communication Plan (Appendix 3). This team will also perform active surveillance, driving or walking stretches of local beach looking for stranded animals on a periodic basis. A minimum of two people at any one time are needed for safety.

### **Active Surveillance**

An active surveillance plan will be implemented to maximize the activities of this two person team. Coordination is planned with the existing stranding network responders (TMMC-SLO and SBMNH) and the Moss Landing Marine Laboratories BeachCOMBERs program, which has volunteers that survey index beaches in the Morro Bay area, as well as with local land management authorities (e.g., State Parks – Environmental Scientists and Rangers) and any aerial survey teams. In addition, up to four sea otter tracking staff working on the USGS-led sea otter monitoring program will be spending considerable time on the coast in the study area and can report any marine mammal strandings.

A seismic study zone is defined as the geographic area from Point Piedras Blancas, San Luis Obispo Co, to Point Arguello, Santa Barbara Co. This area is broader than merely inshore of the seismic survey, as impacted animals may potentially move out of that area and strand to the north or south. This zone may be redefined during the project (expanded or shifted) based upon observations from aerial surveys or animal movement/distribution data. Within the seismic study zone, surveys will be prioritized in areas with higher deposition rates of animals (based upon historic data). These areas include:

- Point Piedras Blancas
- San Simeon
- Cayucos Beach
- Morro Bay area – Morro Rock and Morro Strand
- Montana de Oro State Park
- Avila State Beach
- Pismo State Beach
- Oceano Dunes State Vehicular Recreation Area
- Guadalupe Dunes
- Point Sal State Beach
- Vandenberg Air Force Base – Sherman Creek, San Antonio Creek, Surf Beach, Purisima Point

A comprehensive survey will be undertaken in the 10 days immediately preceding the start of the seismic activities to document and mark all pinniped and cetacean carcasses present on the beach, so that if they are reported again it will be known that they stranded prior to the start of the survey (all sea otter carcasses will be removed or buried, per current sea otter stranding protocols). Potential marking methods include addition of ropes or twine, paint or dye, removal of particular parts, or some other method to be determined; carcasses may also be removed or buried whenever feasible. During the project, the choice of which beach(es) to survey

on a given day will be determined by the 2-person team, and subject to factors such as weather conditions, but the goal will be to cover all of these beaches in a 7-day period (if no stranding response is needed). A survey will consist of walking or slowly driving the beach from one end to the other. Any observed marine mammal strandings will be examined to determine if they were previously detected or if they are new; if new strandings, they would be reported according to the communication protocol (Appendix 3) and an investigation would be started.

The active surveillance and readiness component will also persist past the end of the seismic work to account for animals that may have been impacted at the end of the seismic activities but do not strand until days later. At a minimum, this will be one week after the end of the seismic work. Following this week, the 2-person team will be demobilized and the active surveillance work will be concluded, but the local stranding network responders will continue to respond to all reports of stranded animals, and may complete a detailed investigation.

#### RESPONSE ACTIONS – PINNIPEDS AND CETACEANS

1. **Initial stranding response** – The 2-person team, acting in coordination with the local stranding network responders, will respond to reports of stranded pinnipeds or cetaceans within the seismic study zone when feasible. All marine mammals that are responded to will receive examination appropriate to the condition code of the animal and the feasibility of the logistics.
  - a. **Dead animals** - Once observed, a dead animal will be recovered (including towed or picked up if observed floating) if feasible. Following recovery, the animal will be removed from the beach for necropsy, or a beach necropsy performed if carcass retrieval is not possible (depending on carcass decomposition and logistics/weather/safety conditions). If possible, necropsies will be done in a laboratory setting following diagnostic imaging (for fresh animals). At the necropsy, samples will be taken and may be shipped to appropriate laboratories for diagnosis.
  - b. **Live animals** - Live animals will be evaluated and determined whether they are rehabilitation candidates, should be released from the scene, or euthanized. Cetaceans will receive auditory evoked potential (AEP) examination(s) when appropriate to determine the hearing capabilities of each animal at stranding or at release according to permit requirements and with approval of the veterinarian. Rehabilitation candidates will require transport to the appropriate rehabilitation facility.
  - c. **Mass strandings or other elevated stranding rates** – If a mass stranding occurs, or if stranding rates are very elevated, additional personnel from other stranding network organizations may be brought in for response or animals transported to more distant necropsy or rehabilitation facilities. Significant additional resources must be made available for both live and dead mass stranding response. Costs would be very high if there is a mass stranding event. Depending on the number of animals that strand and on the veterinary assessment for each, animals may be returned to the water and released, taken to a rehabilitation center, or they may be euthanized or die on the beach or during transport. All dead animals would require a necropsy.
  - d. **Phase 1 investigation** – The Phase 1 investigation refers to the initial investigation on a stranded animal (both alive and dead). The specific assessment performed will depend upon the species, condition code, and logistics, but generally includes the following:

- i. General description of the stranding event (numbers, location, environmental parameters, behavioral assessment of live animals)
    - ii. Live animals – physical examination, morphometrics, photographs, blood work, diagnostics such as AEP or ultrasound
    - iii. Dead animals – external examination, morphometrics, photographs, diagnostic imaging including CT/MRI scans as appropriate and feasible, gross necropsy with internal examination, descriptions, photographs and sample collection
    - iv. Preliminary analysis of information collected during Phase 1
  - e. **Phase 2 investigation** – The Phase 2 investigation is a more comprehensive investigation into a stranded animal for purposes of documentation of lesions, determining the cause of stranding or determining the cause of death. Again, the specific assessment will depend upon many factors, and will be informed by the findings obtained during the Phase 1 investigation, but may include:
    - i. Further analyses and review of information obtained in Phase 1 (potentially including formation of an expert panel)
    - ii. Histopathology, including special stains where needed
    - iii. Ancillary diagnostics (e.g., PCR for infectious agents, air bubble sampling when emboli were discovered, domoic acid levels)
    - iv. Additional diagnostic imaging as needed
    - v. Histology of ears, where indicated
2. **Adaptive management** - Adaptive management triggers resulting from stranding investigations have been identified. If these triggers are met, suspension of seismic airgun activities will occur. Following suspension of activities, NMFS and our stranding network partners will further evaluate the available information, including new information collected while activities are suspended, and coordinate with PG&E to determine if and how seismic operations may continue. The triggers that have been identified are as follows:
- a. A mass stranding (2 or more animals that simultaneously strand, other than cow-calf pairs) or atypical nearshore milling (aka "near mass stranding") of any cetacean species. At a minimum, the shutdown would continue until the disposition of the animals was complete - this could involve herding offshore, refloating/transporting/herding, transport to rehabilitation, euthanasia, or any combination of the above. Shutdown procedures will remain in effect until NMFS determines that, and advises PG&E that, all live animals have left the geographic area (either of their own volition or following herding).
  - b. If 2 cetaceans within one day, 3 or more cetaceans within a week, or 5 or more pinnipeds within a week are newly detected stranded (sick, injured, in need of medical attention, or dead) on the beach or floating incapacitated or dead within the impact zone during the seismic testing period, the following would occur:
    - i. For live stranded animals, the stranding team would attempt to capture the animal and perform a Phase 1 examination (detailed above), including auditory evoked potential (AEP) testing of all odontocetes, and any clinical tests deemed necessary by the attending veterinarian. If the animal(s) are determined to be candidates for immediate release (either from the original stranding location or following transport to a new location), shutdown may be needed until the release is complete. If the animal is determined to be a candidate for rehabilitation and the initial examination is

inconclusive regarding a reason for stranding, Phase 2 investigations (see description above) will be conducted.

- ii. For all dead stranded animals, the stranding team would attempt to recover the carcass(es) and perform a detailed necropsy with diagnostic imaging scans to rule out obvious causes of death (e.g. a Phase 1 investigation, described above), as appropriate given the decomposition state of the animal and other logistical constraints (size, weight, location, etc.). Then, if Phase 1 tests are inconclusive and the animal(s) is (are) in good body condition, Phase 2 investigations will be conducted.
  - iii. In either case, if Phase 2 investigations are warranted for enough animals to meet the initial numerical criteria, seismic testing will be suspended.
- c. Strandings of single marine mammals with signs of acoustic trauma or barotrauma without another etiology would require a suspension.
  - d. A shipstrike of a marine mammal by any of the vessels involved in the seismic testing (including observation vessels) would require a suspension.
3. **Final report** - At the end of the survey period, sample and data analyses will be completed and a report will be generated by the SWFSC, SERO, TMMC and SBNHM personnel.

#### RESPONSE ACTIONS – SEA OTTERS

1. **Initial stranding response** – Using the existing network of collaborators, CDFG, USGS, and TMMC will coordinate an efficient, timely response to all reported sea otters strandings.
- a. **Dead animals** – During the project operation and extending seven days after, all dead stranded sea otters between Point Piedras Blancas (San Luis Obispo County) and Point Arguello (Santa Barbara County) will be collected and transported to the MWVCRC for necropsy. Fresh dead and any tagged (i.e., study animal) dead sea otter will be transported via FedEx overnight shipping or scheduled TMMC transport to the MWVCRC, to ideally arrive within 24 hours of recovery. These fresh and/or tagged cases will receive a detailed necropsy by a veterinary pathologist to determine the cause of death. All non-tagged moderately to severely decomposed sea otters recovered within the study area will be collected, frozen and transported to the MWVCRC for future necropsy. At the necropsy, samples will be taken and may be shipped to appropriate laboratories for diagnosis.
  - b. **Live animals** - Following established protocols, all live stranded sea otters will be collected after consultation with CDFG and/or MBA. TMMC has the trained personnel and equipment to provide timely response and transportation. Once a live sea otter is recovered, MBA will direct the treatment for each case. In general, all live sea otters will be transported to MBA as soon as possible.
  - c. **Phase 1 investigation** – The Phase 1 investigation refers to the initial investigation on a stranded animal (both alive and dead). The specific assessment generally includes the following:
    - i. General description of the stranding event (numbers, location, environmental parameters, behavioral assessment of live animals)

- ii. Live animals – physical examination, morphometrics, photographs, blood work, and appropriate diagnostics.
  - iii. Dead animals – external examination, morphometrics, photographs, gross necropsy with internal examination, descriptions, photographs and sample collection.
  - iv. Assessment of stranding numbers and locations in comparison to historic stranding data for sea otters (corrected for increased search effort) to determine if stranding is unusual.
  - v. Preliminary analysis of information collected during Phase 1
- d. **Phase 2 investigation** – The Phase 2 investigation is a more comprehensive investigation into a stranded animal for purposes of determining the cause of stranding or determining the cause of death. If the Phase 1 investigation identifies a clear cause of death that is not associated with the project, Phase 2 investigation may not be required. The specific Phase 2 assessment will depend upon many factors, and will be informed by the findings obtained during the Phase 1 investigation, but may include:
- i. Further analyses and review of information obtained in Phase 1 (potentially including formation of an expert panel)
  - ii. Diagnostic imaging including CT/MRI scans as appropriate
  - iii. Histopathology, including special stains where needed
  - iv. Ancillary diagnostics (e.g., PCR for infectious agents, air bubble sampling when emboli were discovered, domoic acid levels)
  - v. Additional diagnostic imaging as needed
  - vi. Histology of ears, where indicated
2. **Adaptive management** – For sea otters, permitting documents from the USFWS and CDFG call for suspension of activities only in the case of acute mortality found to be associated with the project. There are no interim adaptive management triggers for harassment of sea otters; the USGS sea otter monitoring program may detect potential effects of the project on otters, but sub-lethal effects are not likely to be evident prior to post-project data analysis. If these acute mortality triggers are met, suspension of seismic airgun activities will occur. Following suspension of activities, USFWS and partner agencies will further evaluate the available information, including new information collected while activities are suspended, and coordinate with PG&E to determine if and how seismic operations may continue. The triggers that have been identified are as follows:
- a. Stranding of a single dead sea otter with signs of acoustic trauma or barotrauma without another etiology (based on Phase 2 investigation above) would require a suspension.
  - b. A lethal shipstrike of a sea otter by any of the vessels involved in the seismic testing (including observation vessels) would require a suspension.
3. **Final report** - At the end of the survey period, sample and data analyses will be completed and a sea otter stranding report will be generated by the CDFG and USGS personnel.

## APPENDIX 1

Historical stranding information from the California Marine Mammal Stranding Network and USGS (for sea otters) from the Monterey/San Luis Obispo County line to Point Conception, 1988-2010.

	Species	Total Strandings (1988-2010)			Average Strandings		
		Nov	Dec	Jan	Nov	Dec	Jan
CETACEANS							
	Common Dolphin*	2	2		0.09	0.09	
	Gray Whale	3	0		0.14	0	
	Minke Whale	1	0		0.05	0	
	Northern Right Whale Dolphin	0	1		0	0.05	
	Pacific White-Sided Dolphin	1	0		0.05	0	
	Pygmy Sperm Whale	0	1		0	0.05	
PINNIPED							
	California sea lion	100	86		4.5	3.9	
	Harbor seal	2	1		0.09	0.05	
	Northern elephant seal	9	13		0.41	0.59	
	Northern fur seal	24	3		1.1	0.14	
	Unidentified pinniped	5	5		0.23	0.23	
MUSTELID							
	Southern Sea Otter	108	89	80	4.7	3.9	3.5

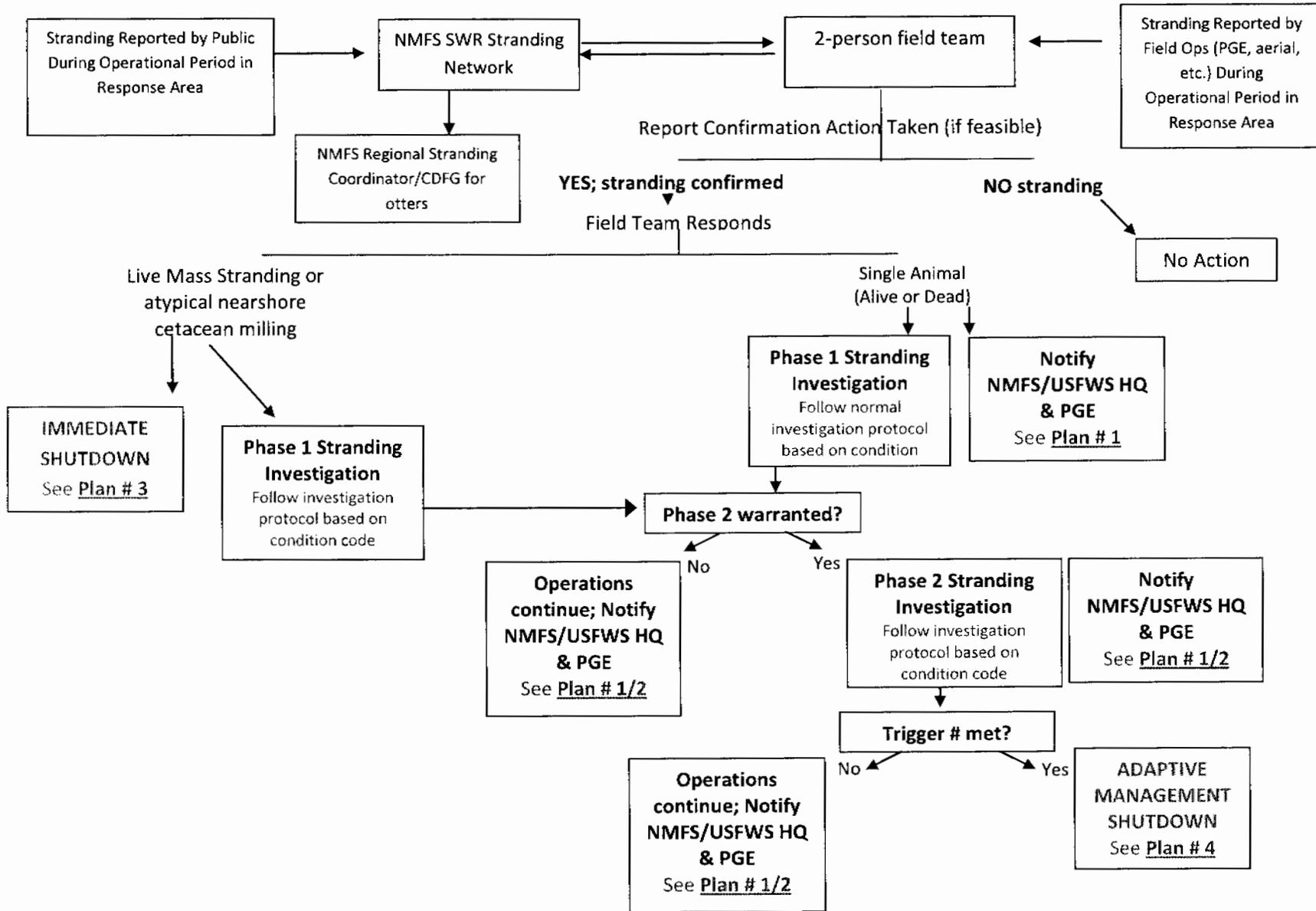
\*includes long-beaked, short-beaked, and unidentified common dolphin

APPENDIX 2

Marine mammal stranding response reporting phone numbers.

Field Team:	TBD
Live Marine Mammals (TMMC):	805-771-8300
Dead Pinnipeds or Cetaceans (SBMNH):	805-682-4711 ext. 156
Dead Sea Otters (CDFG):	805-772-1135 (office); 831-212-7090 (mobile)

**APPENDIX 3: STRANDING RESPONSE ADAPTIVE MANAGEMENT DURING DCPD SEISMIC WORK DECISION TREE**



**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:14 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 4 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE cobo 10 23 12.wmv

**From:** Dr. C. Hite [mailto:aaaptly@gmail.com]  
**Sent:** Saturday, October 27, 2012 9:03 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Re: 4 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To who it may concern;

As a PG&E rate-payer I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

PG&E is moving forward with the expensive and intrusive tagging of the sea otters prior to the closure of public comments before the U.S. Fish and Wildlife Service.

PG&E is moving forward with the expensive and intrusive tagging of the sea otters prior to receiving all 10 permits to move forward with the Seismic Study.

The definition of "harm" includes the trauma to the sea otters in capturing, anesthetize and conduct surgery upon the sea otter.

<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=slo+tribune+sea+otter>

**Web Results**

- **[Research to track otters' response to seismic surveys | Environment ...](#)**

6 days ago... been capturing and tagging **sea otters** along the **San Luis Obispo** County ...  
Laura Dickinson — [ldickinson@thetribunenews.com](mailto:ldickinson@thetribunenews.com) Buy Photo ...

[www.sanluisobispo.com/2012/10/20/2268771/sea-otters-earthquake-tests.html](http://www.sanluisobispo.com/2012/10/20/2268771/sea-otters-earthquake-tests.html)

## • **Otters off SLO County tagged for reactions to seismic tests ...**

Oct 14, 2012... the West Coast are in **San Luis Obispo** County this month to capture and tag as many as 60 **sea otters** as a way to measure their response to high-energy seismic ... David Middlecamp — [dmiddlecamp@thetribunenews.com](mailto:dmiddlecamp@thetribunenews.com) ...

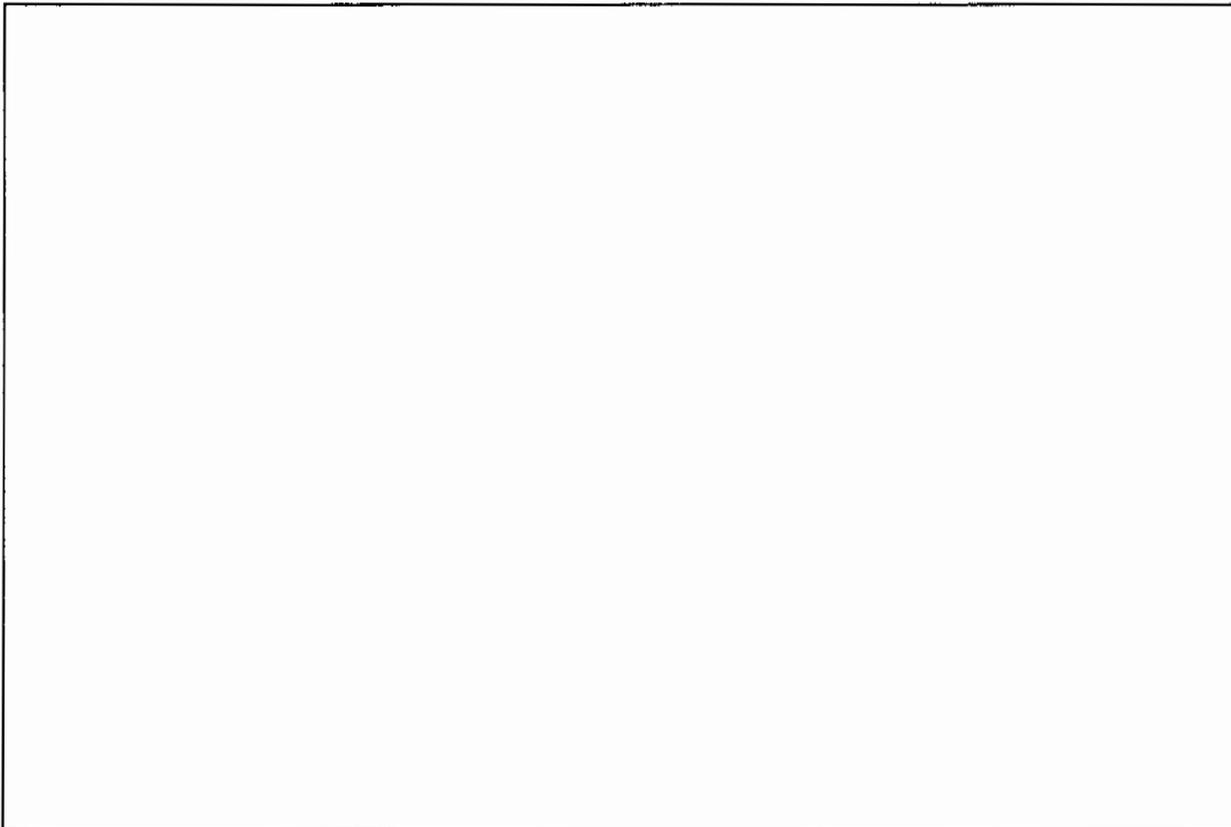
[www.sanluisobispo.com/2012/10/14/2262743/otters-off-slo-county-tagged-for.html](http://www.sanluisobispo.com/2012/10/14/2262743/otters-off-slo-county-tagged-for.html)

#

<http://www.sanluisobispo.com/2012/10/20/2268771/sea-otters-earthquake-tests.html>

# **Research to track otters' response to seismic surveys**

Published: October 20, 2012



Monterey Aquarium veterinarian technician Marissa Viens prepares an otter for an abdominal incision.

Laura Dickinson — [ldickinson@thetribunenews.com](mailto:ldickinson@thetribunenews.com) Buy Photo

How sea otters will be affected by sonic ocean testing is only the latest effort to protect their recovery

By David Sneed — [dsneed@thetribunenews.com](mailto:dsneed@thetribunenews.com)

For decades, wildlife biologists have been concerned about the fate of the southern sea otter.

After being hunted to near extinction in the 1800s, the furry ocean carnivore is staging a slow but faltering recovery. Starting as early as next month, the otters will face a new challenge — high-energy seismic surveys conducted offshore of Diablo Canyon nuclear power plant.

For most of this month, a team of 20 veterinarians, biologists, technicians and research experts has been capturing and tagging sea otters along the San Luis Obispo County coastline from Port San Luis to San Simeon in an attempt to learn how the otters will react to the planned earthquake fault mapping that calls for 250-decibel blasts of sound to be emitted into the ocean every 15 seconds. “How they are going to react is the million-dollar question,” said Tim Tinker, lead researcher for the tagging project with the U.S. Geological Survey.

What is not in question is the fact that California’s sea otters are struggling. Biologists had expected the otters, a fully protected species, to be recovering much more quickly.

The population is 2,800 animals. However, nearly 12 percent of the population died last year, victims of harmful algal toxins, parasites and infectious diseases, mating trauma, emaciation, bacterial infections, heart disease and boat strikes.

“It’s a complex combination of issues that are affecting sea otter health, including natural and man-made factors,” Tinker said.

“The research we are doing into the effects of the seismic surveys on otters is a continuation of research we have been doing on the overall health of the otter population for decades.”

### **Intent, impact of seismic testing**

PG&E, the owner of the Diablo Canyon plant, is in the process of getting 10 regulatory permits it will need to conduct the high-energy seismic surveys. One of the most important is a permit from the California Coastal Commission, which will consider the matter when it meets in Santa Monica starting Nov. 14.

The testing is intended to give PG&E and regulators a better understanding of the earthquake faults off Diablo Canyon. Such information became more critical following the Fukushima tsunami and nuclear disaster in Japan last year.

Studying the effects the seismic surveys will have on a variety of marine species, including sea otters, is one of the mitigation measures already imposed on PG&E by state officials.

The seismic testing has garnered intense opposition, mostly because of the damage it could do to marine life. Previous research indicates that the otters’ behavior initially changes in reaction to the sonic blasting, but they become habituated to it and return to more normal behavior.

“The chance of seeing an otter killed or injured by this type of seismic surveying is very remote,” said Jim Curland, advocacy program director for Friends of the Sea Otter in Monterey. “Sea otters spend much of their time on the surface and deal with sound differently than other marine mammals like whales, which use sound to echolocate.”

However, it is unknown if the surveys will cause more subtle or long-term behavioral changes in the otters. For this reason, Friends of the Sea Otter is opposed to the seismic surveys, but supports capture-and-tag research in order to learn more about the animals.

“If these surveys are going to get green-lighted, it’s important to have in place something that will measure the effects,” Curland said. “I have faith in the scientists doing the monitoring.”

The researchers are capturing as many as 60 otters, two-thirds of them from within the seismic survey area and a third outside it. The otters tagged outside the seismic survey area will be used as a baseline against which the behavior of the otters from within the survey area can be compared.

Each captured otter has a time-depth recorder and a VHF radio transmitter implanted within its abdominal cavity. The time-depth recorder logs how frequently and deeply the otter dives and how long it stays submerged. It also records the animal’s body temperature, said Michelle Staedler, sea otter research coordinator with the Monterey Bay Aquarium.

The data will paint a detailed picture of the otter’s behavior over a year and a half. After that time, the otter must be recaptured and the device removed to download the data. The radio transmitter allows researchers to track the movements of the otter and pinpoint its location for recovery of the time-depth recorder, Staedler said.

### **Tagging sea otters is complex**

Capturing and tagging a sea otter is a complicated effort. Spotters locate groups of the animals resting atop kelp beds. They wait until one of the animals falls asleep.

Divers sneak up underneath the sleeping otter and scoop it up in a closable net called a Wilson trap. A boat ferries the otter to a mobile surgical laboratory on shore.

There, veterinarians implant the tracking devices and take a myriad of blood and tissue samples before the otter is taken back to its capture site and released. The blood and tissue samples contain as many as 14 chemical markers that will tell biologists what kind of stressors the otter is experiencing and what type of prey it is eating.

The surgery is tricky because the incision must be sutured closed without shaving the area around it. To shave the incision area would expose the otter to hypothermia, said Dr. Mike Murray, a wildlife veterinarian with the Monterey Bay Aquarium.

Biologists have been tagging sea otters since the 1980s, starting in Alaska; no otters have died during the tagging process. This is because they are robust animals and veterinarians follow well-established procedures, Murray said.

“When you are handling wildlife, it’s a tricky proposition, especially with carnivores and endangered species,” he said. “You don’t want to take any shortcuts. The otters deserve better.”

The U.S. Fish and Wildlife Service is considering issuing PG&E an incidental harassment agreement as part of seismic testing. If issued, it will allow limited harassment of otters, but no lethal take.

## How officials will monitor surveys

In order to enforce this agreement, monitors will be keeping close track of the otters and their behavior while the seismic surveys are taking place. Federal wildlife officials could consider shutting down the seismic surveys if any of the following scenarios occur, Tinker said.

- An inordinate number of sick or dead otters wash up on local beaches.
- A dead otter is found with damage to its brain or eardrums as a result of the sonic blasts.
- A significant number of female otters are displaced from the survey area.

Female otters are potentially more vulnerable to the seismic surveys, Tinker said. They tend to remain in one relatively small geographic area where they are familiar with food sources.

Any sea otter must consume a quarter of its body weight a day in order to maintain the high metabolic rates needed to stay warm in the chilly waters of the Pacific Ocean. Nursing females need even more food because a third of their diet goes to their pups, Staedler said.

Even under optimal conditions, most females are emaciated and in poor physical shape by the time they wean their pups, a condition biologists call end-lactation syndrome. The stress of being displaced by the seismic testing to areas the females are unfamiliar with could cause lower weaning rates and other problems that may not be immediately evident, Tinker said.

The public is encouraged to report any sick sea otters to the local Marine Mammal Center office in Morro Bay at 771-8300.

As of Wednesday, 42 otters had been tagged, with eight of them coming from outside the seismic survey area. The researchers hoped to tag 50 otters by Friday, when the operation was to conclude.

More otters could be tagged next year to bring the total to the desired 60 animals. PG&E plans to begin the seismic surveys this year and complete them next year.

The researchers encountered several unexpected problems that reduced the number of otters they were able to catch and tag. These included a great white shark scare and poor sea conditions.

Read more here: <http://www.sanluisobispo.com/2012/10/20/2268771/sea-otters-earthquake-tests.html#storylink=cpy>

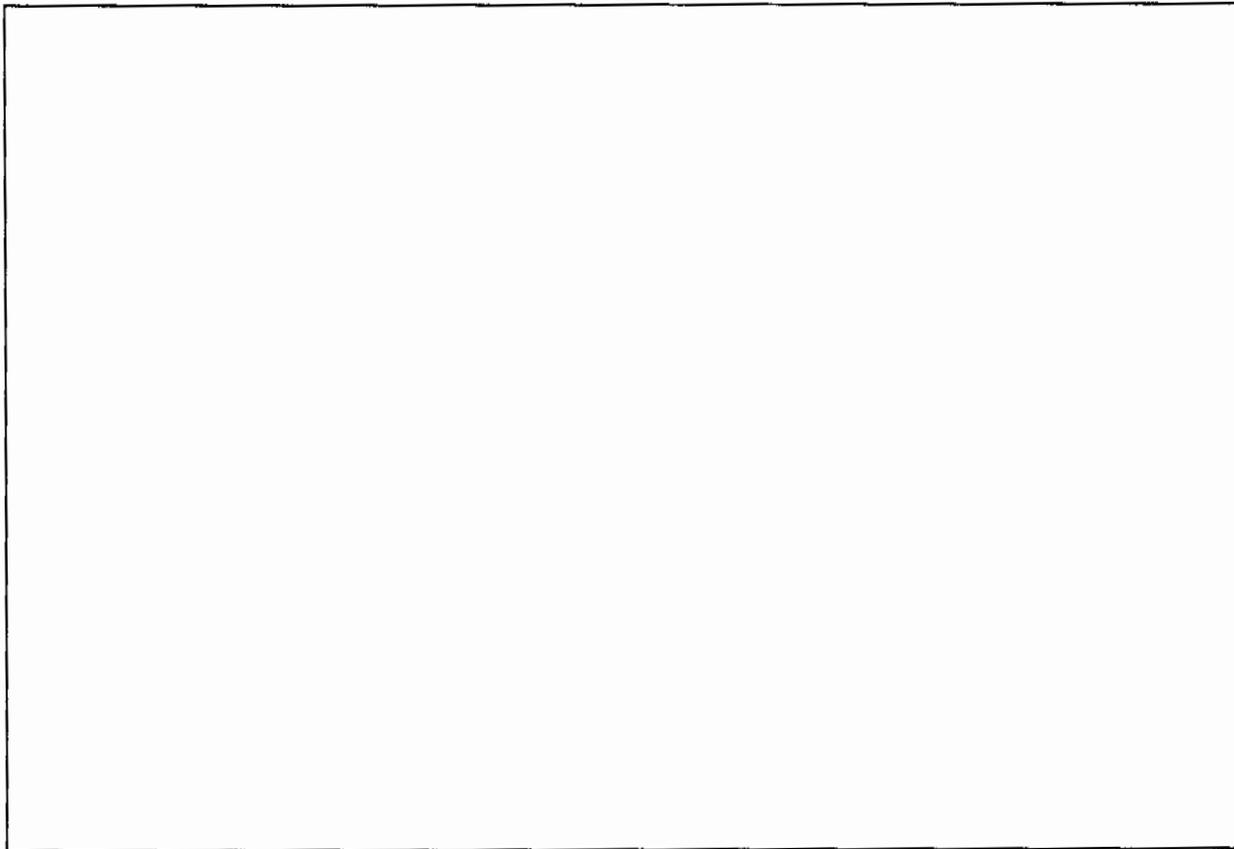
- Related Stories:
- [Nearly 3,000 marine mammals will be harassed in Diablo Canyon seismic survey](#)
- Related Galleries:
- [Gallery: Tracking otters along SLO County's coast](#)

#

<http://www.sanluisobispo.com/2012/10/14/2262743/otters-off-slo-county-tagged-for.html>

# Otters off SLO County tagged for reactions to seismic tests

Published: October 14, 2012



A group of otters frolics in Morro Bay.

David Middlecamp — [dmiddlecamp@thetribunenews.com](mailto:dmiddlecamp@thetribunenews.com)

Researchers want to know how they will respond to high-energy fault mapping off Diablo Canyon

By David Sneed — [dsneed@thetribunenews.com](mailto:dsneed@thetribunenews.com)

*Correction: Due to incorrect information supplied by the U.S. Geological Survey, an earlier version of this story incorrectly stated that the federal Fish and Wildlife Service has issued a permit allowing limited harassment of otters. PG&E has applied for such authorization, but the permit has not yet been given, said Scott Flaherty, USFW spokesman.*

Wildlife biologists and other researchers from along the West Coast are in San Luis Obispo County this month to capture and tag as many as 60 sea otters as a way to measure their response to high-energy seismic studies scheduled to begin next month.

The research consists of surgically implanting into each otter a device that records its diving activity as well as a radio transmitter that allows researchers to track its movements for up to three years. Blood and tissue samples are also taken.

Of the 60 otters captured, 40 will be those living in the area where PG&E will conduct its offshore earthquake fault mapping, and 20 will be from outside that area. By comparing data collected from animals inside and outside the survey area, biologists will be able to measure how the otters react to the loud sounds emitted by the research vessel conducting the surveys.

“Sea otters spend more time on the surface of the water and have less sensitive hearing,” states a fact sheet about the monitoring project. “Thus, impacts of the project on sea otters could be less than the impacts on other marine mammals.”

The capturing and tagging operations are scheduled through Saturday in an area from Port San Luis to San Simeon. Shore-based teams of veterinarians using mobile surgical suites operated at locations north and south of Diablo Canyon nuclear power plant on PG&E land and in Morro Bay Harbor. On Thursday, they moved to San Simeon to finish the captures.

Aerial and shoreline monitoring of the otters will be conducted during and after the surveys to determine whether the animals’ behavior changes as a result of the surveys and to detect any dead or stranded animals.

During the first week of the project, 20 otters were captured and 16 were tagged. Four were pregnant females that could not undergo surgical implantation of the transmitters, said Tim Tinker, research leader with the U.S. Geological Survey.

“All surgical procedures and sampling has been successful and unremarkable, and all animals were returned to their capture sites alert and in good condition,” he said. “Field tracking of the radio-tagged study animals has also been progressing well, with all 11 of the animals tagged in days one and two of captures already resighted at least once.”

California sea otters are listed as threatened on the Endangered Species Act. PG&E has applied for a permit from the U.S. Fish and Wildlife Service that allows limited harassment of otters.

The otters are captured while sleeping by divers using long-handled nets called Wilson traps. In addition to implanting the two devices, a variety of measurements and samples are taken from the otters that allow veterinarians to assess the animals’ health and the type of stressors they are dealing with.

Time depth recorders are a valuable tool in tracking an otter’s feeding habits. The device records how deep the otter dives and how long it stays underwater.

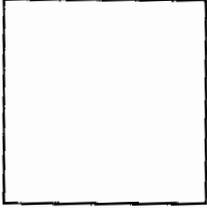
“That gives us a good idea of how much energy they are expending each day, because when otters are diving they are hunting for food,” Tinker said. “The rest of the time, they are on the surface sleeping, grooming or nursing.”

The sea otter research project is a cooperative effort among the U.S. Geological Survey Western Ecological Research Center, U.S. Fish and Wildlife Service, California Department of Fish and Game and the Monterey Bay Aquarium. A USGS biologist from Alaska and veterinarians from Seattle Aquarium are also participating.

PG&E plans to begin its surveys in mid-November. The fault mapping is designed to yield new geologic information that was made more critical in light of the Fukushima disaster in Japan last year.

Read more here: <http://www.sanluisobispo.com/2012/10/14/2262743/otters-off-slo-county-tagged-for.html#storylink=cpy>

#



On Sat, Oct 27, 2012 at 4:47 PM, Dr. C. Hite <[aaaptly@gmail.com](mailto:aaaptly@gmail.com)> wrote:  
[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

---

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
805 5341232

*Already included in the first e-mail . wph*

To whom it may concern;

As a PG&E rate-payer I conscientiously objection to further Seismic Study on the Central Coast of California.

Attached are photographs of sea otter habitat in Los Osos-Baywood Park, Baywood (back bay) - Estero Bay, (Morro Bay), and Avila Bay off the Port San Luis Pier.

The Central Coast of California and our sea otter population is most affected by the PG&E applications for further Seismic Study on the Central Coast. PG&E Diablo Canyon Nuclear Power Plant is located on the Central Coast of San Luis Obispo County.

However, the public of the Central Coast just now have an agenda item set for October 30,2012, to have their voices officially heard by our local representatives. This will be past all important permitting and public comment periods, including; California Department of Fish and Game, National Marine Fisheries, U.S. Fish and Wildlife Services and the California Coastal Commission. Enclosed is the link for official public comments received and posted by the County of San Luis Obispo, on the Central Coast of California. There are many references to habit, food source and marine mammal "take" including the sea otter. Please include these numerous public comments as part of the California Coastal Commissions consideration of public comments, as there is a significant amount of research and representation of the true opinions

**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:14 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 5 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE 102512 FWS.JPG

**From:** Dr. C. Hite [mailto:aaaptly@gmail.com]  
**Sent:** Saturday, October 27, 2012 10:03 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 5 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

Cassidy.Teufel@coastal.ca.gov

California Coastal Commission

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To whom it may concern;

I have conducted my research in the simplest manner by asking these questions;

what does the otter eat?  
what does the mussel eat?  
what does the plankton eat?

and what happens if the plankton dies?

**what does the otter eat?**

<http://www.seaworld.org/animal-info/info-books/otters/diet.htm>

**Diet & Eating Habits**

**FOOD PREFERENCES AND RESOURCES**

1. Food habits vary significantly according to species, location, and season.

- A sea otter's diet consists mainly of slow-moving fishes and marine invertebrates including crabs, sea urchins, abalones, clams, mussels, and snails. Food preferences vary among individuals.

2.

Two or more otter species occupying the same geographical area usually have different food habits.

- In Monterey Bay, California, researchers found that each sea otter tends to specialize in only a few types of the more than 50 available invertebrates. This behavior may reduce competition in the California population.

### **Habitat & Distribution**

<http://www.seaworld.org/animal-info/info-books/otters/habitat-&-distribution.htm>

1. Otters are widely distributed. They are found on all continents except Australia and Antarctica.
2. North America.
  - California sea otters are found off the coast of central California; between Half Moon Bay and Pt. Conception. There is also a small experimental population that originated from relocated animals at San Miguel Island off the coast of Santa Barbara.
  - Historically, sea otters occupied a contiguous range from northern Japan, across the North Pacific, and down to Baja California, Mexico. They were hunted nearly to extinction, but conservation measures have allowed some populations to recover.

### **HABITAT**

1. Otters are usually found no more than a few hundred meters from water. Most species are entirely dependent on aquatic habitats for food.
  - Sea otters (genus *Enhydra*) are found in coastal waters of the North Pacific, rarely more than 1 km (0.6 mi.) from shore.
    - They are capable of spending their entire life at sea, but sometimes rest on rocky shores. The Alaska otter has a greater tendency to haul out (come to shore) than the California otter.
    - California otters often prefer kelp beds, probably because of the protection and food resources they provide.

## REPRODUCTIVE CYCLES

<http://www.seaworld.org/animal-info/info-books/otters/reproduction.htm>

The reproductive cycle in California sea otters is about 12 months. If a female's pup does not survive, she may experience postpartum estrus.

<http://www.seaworld.org/animal-info/info-books/otters/birth-&-care.htm>

## PUP DEVELOPMENT

Sea otters normally have a single offspring. About 2% of all otter births are multiple, but only one pup can be successfully cared for.

## Longevity & Causes of Death

<http://www.seaworld.org/animal-info/info-books/otters/longevity.htm>

## DISEASE AND PARASITISM

In the late 1990s the California sea otter population mysteriously declined. Many of the recovered and rescued animals had a higher than normal rate of parasitic, bacterial, or fungal infections that were probably major factors in the slow population recovery rate. The three most common parasites found in California sea otters are *Toxoplasma gondii*, *Sarcocystis neurona*, and Acanthocephalans.

## PREDATORS

Sea otter carcasses in California have been found bearing wounds and tooth fragments identified as those of white sharks, but there is no direct evidence that white sharks consume sea otters. These findings suggest that white sharks may attack, but not prey on, sea otters.

Other threats to otters include pollution, habitat destruction, and persecution - commercial and game fisheries see otters as competition for resources.

#

what does the mussel eat?

[http://www.ehow.com/facts\\_4964115\\_what-do-mussels-feed.html](http://www.ehow.com/facts_4964115_what-do-mussels-feed.html)

## Food

- A mussel's diet consists of plankton, bacteria and the remains of dead animals and plants.

## Siphoning

- Mussels take in water through an opening in its body called a siphon. Water and microscopic food particles flow in through the incoming siphon, and after the food has been removed, the water passes out of the mussel through a second outgoing siphon.
- 

## Filtering

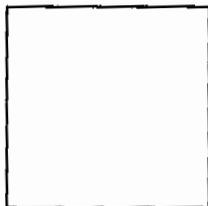
- The gills secrete a thick substance which traps the food inside the mussel while allowing the water to continue flowing. The retained nutrients move to the palps, which is a sensory appendage for the mussel.

#

<http://californiawatch.org/dailyreport/climate-change-may-be-muscling-mussels-11510>

## Climate change may be muscling in on mussels

July 15, 2011 | [Susanne Rust](#)



Kate McCarthy/ FlickrAn experiment by UC Davis researchers shows California mussels are threatened by ocean acidification.

Polar bears may have stolen the show when it comes to climate change, but it may be the lowly California mussel that we really should be watching.

A new study by researchers at UC Davis shows that rising acid levels in the ocean thin and weaken the shells of this diminutive bivalve. And that could spell trouble for entire marine ecosystems.

“This is a very important species, a foundation species,” said Brian Gaylord, lead author of the paper and a researcher at UC Davis. “They provide habitat, food and refuge for literally hundreds of other animals.”

According to the study's authors, weakened shells could make the mussels

more vulnerable to predation and sickness.

Carbon dioxide, a greenhouse gas, is absorbed in the ocean. Research has shown that between 25 and 40 percent of human-produced carbon emissions have entered the ocean since the beginning of the Industrial Age.

Absorbed carbon then decreases the ocean's pH, which means its acidity increases. Studies have shown that since 1750, there's been a 30 percent increase in the ocean's acidity.

To find out what acidification does to some of the creatures living in the ocean, Gaylord and his team decided to focus on the California mussel, which lives in West Coast seabeds stretching from California to Alaska.

In the laboratory, the team exposed mussels to acid levels that the Intergovernmental Panel on Climate Change – a Geneva-based scientific body established by the United Nations – has projected for the next several decades.

Another group was kept in water with the same acid levels found in oceans today.

The researchers found that the mussels living in the high-acid water had smaller, thinner and weaker shells. They also had smaller bodies.

Gaylord said the weaker shell and reduced body size make the mussels more vulnerable to crabs, which could easily crush their weak shells. Carnivorous snails also could easily drill into the weakened shells.

He said one study already has shown declining numbers of California mussels offshore of Washington state.

Quantifying how much of an impact a declining mussel population would have on marine ecosystems is hard to estimate. But with so many animals depending on them, the effect could be devastating.

The study was published in The Journal of Experimental Biology.

#

what does the plankton eat?

<http://answers.yahoo.com/question/index?qid=20090206183118AACM3Gd>

There are two types of plankton. Plant, which is called phytoplankton and animal, which is zooplankton. Phytoplankton use photosynthesis to make their own "food". Zooplankton are consumers. There are many species. They will eat anything smaller than themselves. Any microbes,

phytoplankton, smaller zooplankton, fungus, bacteria and eggs, such as jellyfish eggs.

[http://wiki.answers.com/Q/What\\_do\\_plankton\\_eat](http://wiki.answers.com/Q/What_do_plankton_eat)

Most plankton, known as phytoplankton, (but not all) eat in much the same way as do plants - through photosynthesis, the process by which sunlight is converted into food energy.

#### **More**

Planktonic animals mostly eat other plankton, including the planktonic plants described above, and smaller animals which are also plankton. The smallest of the plankton can eat bacteria and detritus, but the largest of the plankton are true predators. These kind of plankton are called zooplankton, because they are animals.

#

what happens if the plankton dies?

#### **Web Results**

- **Is ocean life being wiped out? - The Week**

Aug 3, 2010 ... **What happens if the phytoplankton die out?** We'll have dead seas, and a rapid build-up of CO2 in our atmosphere which would theoretically ...

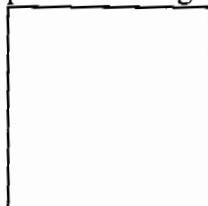
<http://theweek.com/article/index/205607/is-ocean-life-being-wiped-out>

#### **Environment**

## **Is ocean life being wiped out?**

**Plant plankton, the microscopic vegetation that marine life depends upon, is dying out at an alarming rate. That spells bad news for all life, say scientists, ocean-dwelling or otherwise**

posted on August 3, 2010, at 7:15 AM



Diatoms, one of the most abundant phytoplankton: Are they in trouble?  
Photo: NOAA/Wikimedia Commons

They may sit at the bottom of the undersea food chain, but plant plankton, or phytoplankton, perform a vital service to life on Earth. The microscopic algae provide energy for underwater life, absorb carbon dioxide, and produce half the world's oxygen. But they are disappearing from our oceans at an alarming rate. A brief guide to the worrying decline in plant plankton levels:

### **What exactly are phytoplankton?**

Phytoplankton are tiny plants that provide the foundation for the entire marine ecosystem. They supply nutrients and energy to zooplankton, the smallest creatures in the ocean. Zooplankton, in turn, feed fish and other marine life. Phytoplankton also absorb carbon dioxide and produce oxygen. Scientists say that much of the oxygen in our atmosphere was produced by plant plankton, through photosynthesis, over the past 2 billion years.

### **How rapidly are they disappearing?**

Very rapidly indeed. A new study in the journal *Nature* has found that worldwide phytoplankton levels have been declining steadily since 1899. They are down 40 percent since 1950, and drop by about 1 percent every year. "Phytoplankton is the basic currency for everything going on in the ocean," said Boris Worm, one of the study's authors. "It's almost like a recession... that has been going on for decades."

### **Why are they in such rapid decline?**

The primary suspect is global warming, according to the report. The ocean temperature has risen by between 0.5 and 1 degree Celsius in the past century. As surface water gets warmer, it doesn't mix as well with colder, deeper water that is rich in nutrients the phytoplankton need. But the report adds that phytoplankton have also disappeared from cold regions, such as the Arctic Ocean, where phytoplankton growth is mainly limited by sunlight — meaning that "changes in wind and ocean circulation" might also be to blame.

### **Why does all this matter?**

It's bad news for all creatures that rely on the oceans for food — from fish to whales to seabirds. Our fish stocks, which are already affected by overfishing and climate change, will diminish further if the decline continues. And there will be fewer plants to absorb the harmful CO<sub>2</sub> in our atmosphere.

### **What happens if the phytoplankton die out?**

We'll have dead seas, and a rapid build-up of CO<sub>2</sub> in our atmosphere which would theoretically speed up the effects of global warming. But the report's authors say there is no evidence to suggest the decline is terminal.

### What do the pundits say?

It's yet another argument in favor of controlling our carbon emissions, says Michael Graham Richard at Treehugger. "When you don't understand how your life-support system works, you should be more careful when tinkering with it." Let's not "succumb to outright panic *quite yet*," says Megan McArdle in *The Atlantic*. Nature has a way of offsetting big changes — won't all the extra carbon "make terrestrial plants grow more lushly"? Besides, this is just "one paper" — phytoplankton might not be in the dire shape these researchers think. "When you add this to the decline in butterflies, bees and beetles, says Michael Marshall at the *New Scientist*, it's a "remarkably bad piece of news." These tiny creatures do the "lion's share" of sustaining life on Earth and they're dying out. "Never mind the pandas. It's plankton, bugs, and fungi you should be worrying about."

Sources: *Nature*, *Yahoo! News*, *The Scientist*, *New Scientist*, *San Francisco Chronicle*, *The Atlantic*

#

- **Phytoplankton Population Drops 40 Percent Since 1950: Scientific ...**

Jul 29, 2010 ... "The first question is what will **happen** in the future. .... Are there regular summertime **plankton die-offs** as a result of rising temperatures?"

<http://www.scientificamerican.com/article.cfm?id=phytoplankton-population>

## Phytoplankton Population Drops 40 Percent Since 1950

Researchers find trouble among phytoplankton, the base of the food chain, which has implications for the marine food web and the world's carbon cycle

By Lauren Morello and ClimateWire

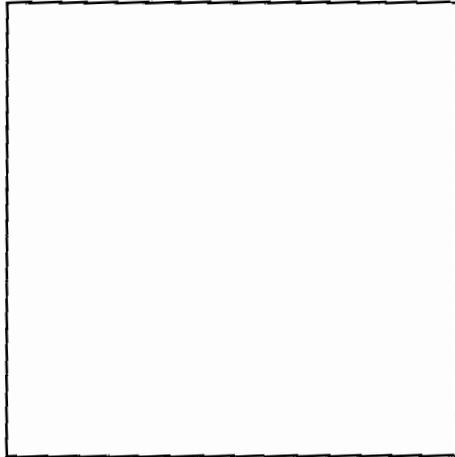


Image: Photo courtesy of Nikon Small

World

## More In This Article

- **Tiny Organisms Provide Power To Move Oceans**

The microscopic plants that form the foundation of the ocean's food web are declining, reports a study published July 29 in *Nature*.

The tiny organisms, known as phytoplankton, also gobble up carbon dioxide to produce half the world's oxygen output—equaling that of trees and plants on land.

But their numbers have dwindled since the dawn of the 20th century, with unknown consequences for ocean ecosystems and the planet's carbon cycle.

Researchers at Canada's Dalhousie University say the global population of phytoplankton has fallen about 40 percent since 1950. That translates to an annual drop of about 1 percent of the average plankton population between 1899 and 2008.

The scientists believe that rising sea surface temperatures are to blame.

"It's very disturbing to think about the potential implications of a century-long decline of the base of the food chain," said lead author Daniel Boyce, a marine ecologist.

They include disruption to the marine food web and effects on the world's carbon cycle. In addition to consuming CO<sub>2</sub>, phytoplankton can influence how much heat is absorbed by the world's oceans, and some species emit sulfate molecules that promote cloud formation.

### **A continuing mystery story**

"In some respect, these findings are the beginning of the story, not the end," Boyce said. "The first question is what will happen in the future. We looked at these trends over the past century but don't know what will happen 10

years down the road."

The study "makes a sorely needed contribution to our knowledge of historical changes in the ocean biosphere," said David Siegel of the University of California, Santa Barbara, and Bryan Franz of NASA in an essay, also published in *Nature*.

"Their identification of a connection between long-term global declines in phytoplankton biomass and increasing ocean temperatures does not portend well for [ocean] ecosystems in a world that is likely to be warmer," they wrote. "Phytoplankton productivity is the base of the food web, and all life in the sea depends on it."

Boyce said he and his co-authors began their study in an attempt to get a clearer picture of how phytoplankton were faring, given that earlier studies that relied on satellite measurements produced conflicting results.

### **Biggest declines at the poles**

The scientists dug back into the historical record, well past 1997, the year continuous satellite measurements began. They examined a half-million data points collected using a tool called a Secchi disk, as well as measurements of chlorophyll—a pigment produced by the plankton.

The Secchi disk was developed in the 19th century by a Jesuit astronomer, Father Pietro Angelo Secchi, when the Papal navy asked him to map the transparency of the Mediterranean Sea.

What Secchi produced was a dinner plate-sized white disk that is lowered into ocean water until it cannot be seen anymore. The depth it reaches before disappearing gives a measure of water clarity.

That can be used as a proxy for phytoplankton population in a given area, since the tiny organisms live close to the ocean's surface, where they are exposed to sunlight they use to produce energy.

Data gathered with a Secchi disk are roughly as accurate as observations collected by satellites, Boyce said, although satellites have greater global reach.

The researchers found the most notable phytoplankton declines in waters near the poles and in the tropics, as well as the open ocean.

They believe that rising sea temperatures are driving the decline. As surface water warms, it tends to form a distinct layer that does not mix well with cooler, nutrient-rich water below, depriving phytoplankton of some of the materials they need to turn CO<sub>2</sub> and sunlight into energy.

#

### **Final Comments**

Sea otters and the sea otters food chain of mussel and plankton are stressed and in decline.

As a PG&E ratepayer I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

Sea otters were "hunted nearly to extinction, but conservation measures have allowed some populations to recover."

The PG&E Seismic Study has and will interfere with conservation measures and the recovery of some sea otter populations.

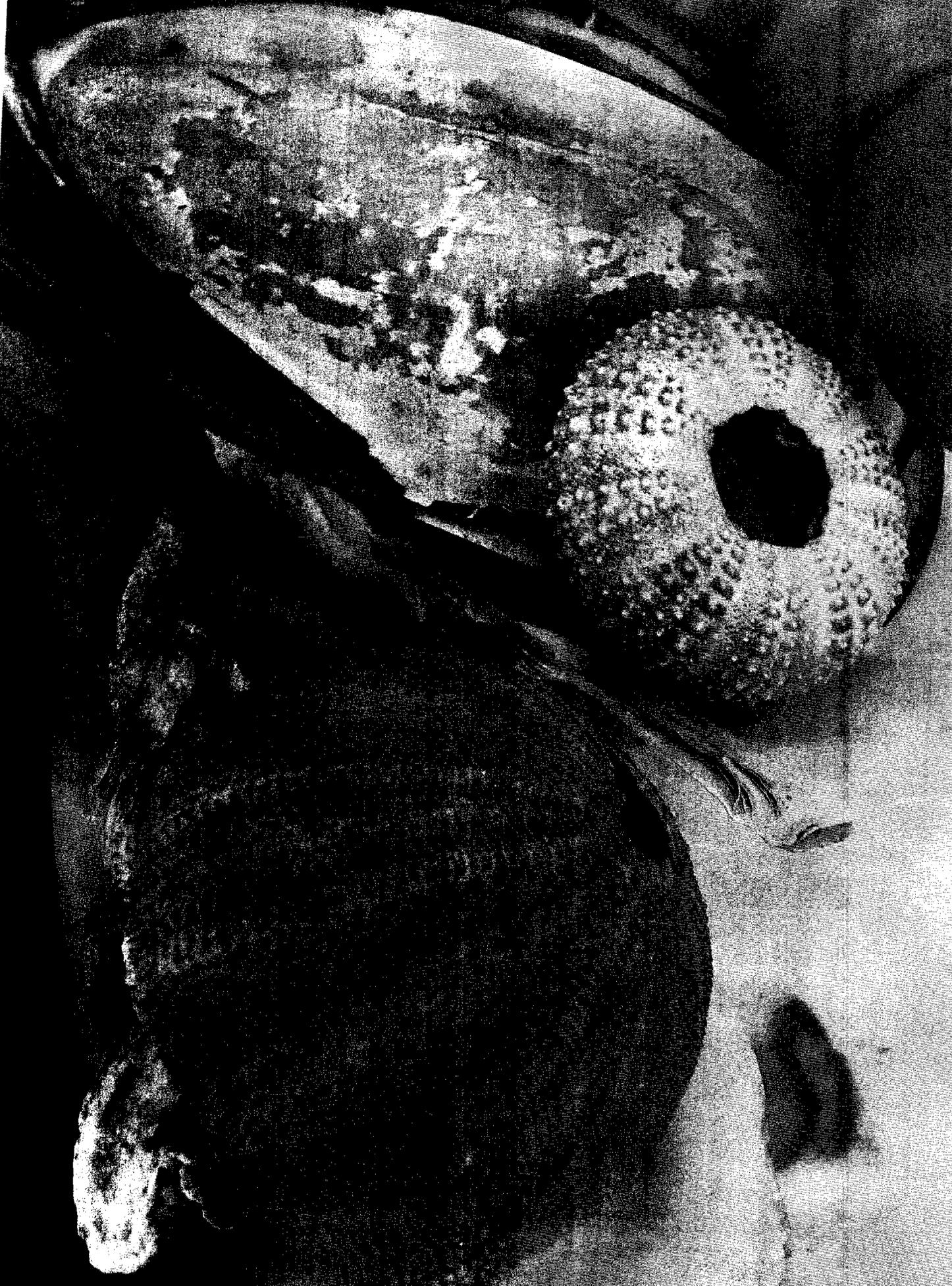
The reproductive cycle of the sea otter is 12 months. There is NO off-season for sea otters and their pups in order for PG&E to conduct the Seismic Study.

The California otter is less inclined to come ashore to escape the harassment caused by the Seismic Study. The otter are dependent on the kelp beds to find food and for shelter, which may be damaged by the air gun blasts. The "hold-fasts," which anchor the kelp beds may be damaged by the air gun blasts. The plankton within the decibel path will die, causing a catastrophic cascades effect. The food chain will be damaged and *broken* following the initial "harassment," which will contribute to hunger and susceptibility to disease.

Most obviously, the sea otter may become malnourished and die.

Attached: HITE 102512 FWS.jpg

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**Tagab, Clarita@Coastal**

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:14 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 7 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE-Mt-St-Helens-1981-001.jpg; ss NOVA Spirit Lake .wmv

**From:** Dr. C. Hite [mailto:aaaptly@gmail.com]  
**Sent:** Sunday, October 28, 2012 2:14 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 7 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To who it may concern;

I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

I have first hand knowledge of what the destruction of an aquatic eco-system looks like when it is truly unavoidable.

Attached: HITE-Mt-St-Helens-1981-001.jpg

Destruction of living cells and organisms within the decibel path will create an environment for bacteria, which depletes oxygen.

Destruction of the plankton = destruction of oxygen and the food source that supports marine mammals, including sea otter.

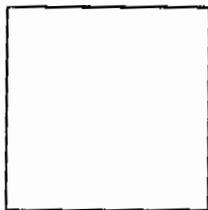
*Yes, the plankton will return,* but not before the interruption in the food chain contributes to starvation.

We have an example of natural disaster that destroyed a food chain.

Attached: s NOVA Spirit Lake.

<http://www.pbs.org/wgbh/nova/nature/mt-st-helens.html>

- Posted 03.01.10
- NOVA



## **Watch Mt St Helens: Back From the Dead**

53:08

Aired May 4, 2010 on PBS.

### **Program Description**

The May, 1980, eruption obliterated all visible life in the lake. The surface was smothered in a blanket of debris. In the murky water, there was an explosion of bacteria.

*CHARLIE CRISAFULLI:* There were a couple of species of pne..., pneumonia that were described, and also the disease, the bacteria that causes legionnaires disease, legionella. And so, many of us working in the lakes, in the early days, came down with a fever.

*NARRATOR:* The bacteria rapidly consumed the oxygen, making life impossible for any air-breathing organisms including fish, amphibians and insects.

*CHARLIE CRISAFULLI:* We said it's going to be decades and decades before this resembles anything like a typical lake in the Cascade Mountain Range. Well, we were surprised, because that's not exactly what happened.

*NARRATOR:* Scientists begin routine water sampling. It's a unique opportunity to see if and when life will return from the dead.

At first there's nothing, but as the debris settles, the water clears, light levels improve. Then, three years after the eruption, there's a crucial discovery: microscopic plants. They're phytoplankton, plants that turn sunlight into oxygen.

They've been brought in by birds or blown in by the wind. They are the basic building block of aquatic life.

Over the following months, as light levels continue to improve, the plankton population grows.

*CHARLIE CRISAFULLI:* In fact, between 1983 and 1986, 135 different species of these tiny plants had colonized the lake. They provide the oxygen and also the prey for the food web.

*NARRATOR*: Sunlight, oxygen and food; several years after its complete destruction, Spirit Lake is coming back to life.

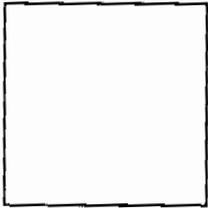
Four miles away, the volcano remains quiet. The lava dome has stopped growing. Many geologists think the show is over, at least in their lifetime.

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<http://www.tandfonline.com/doi/abs/10.1080/07438140609354362>

## Lake and Reservoir Management

**Volume 22, Issue 4, 2006**



# Posteruptive Response of Phytoplankton and Zooplankton Communities in Spirit Lake, Mount St. Helens, Washington

Douglas W. Larson<sup>a</sup>, Jim Sweet<sup>b</sup>, Richard R. Petersen<sup>a</sup> & Charles M. Crisafulli<sup>c</sup>

pages 273-292

Version of record first published: 29 Jan 2009

**Article Views:** 16

[TOC email alert](#) | [Citation email alert](#)

### Abstract

Spirit Lake, Washington was radically altered limnologically by the May 1980 eruption of Mount St. Helens. The eruption provided a rare opportunity to study lake response and recovery in the wake of volcanic disturbance. During the eruption, and for several months thereafter, phytoplankton and zooplankton populations were subjected to extremely deleterious conditions. Consequently, these populations were virtually eliminated except for remnant organisms that somehow survived. During the next two years, the phytoplankton community and presumably the zooplankton community were comprised of only a few opportunistic species whose combined abundance was low. By 1983, however, phytoplankton abundance and species diversity had greatly increased due to increased lake-water transparency and increased availability of inorganic nitrogen. The reestablishment of the zooplankton community was also well underway by 1983, as indicated by the abundance of some species and the presence of most taxa that existed prior to the May 1980 eruption. By 1986, the phytoplankton and zooplankton communities were beginning to resemble those found in subalpine,

oligotrophic/mesotrophic lakes in the Washington-Oregon Cascades. The rapid recovery of Spirit Lake demonstrated the vigor and resiliency of lake ecosystems and particularly plankton communities.

#

<http://creation.com/after-devastation-the-recovery>

## The death and rebirth of Spirit Lake

On the morning of May 18, 1980, Spirit Lake, a paragon of tranquility and beauty, was virtually obliterated. About one-third of the avalanche of debris ploughed directly into this azure jewel, causing its water to slosh over 240 metres (800 feet) up the mountain slopes to the north, where it picked up the soil and vegetation of an old-growth forest, including a million logs. When this organic soup returned, it was to a new lake basin, elevated over 60 metres (more than 200 feet) above its pre-eruption level. Oven-hot flows of volcanic debris boiled into the lake's south shore, and volcanic rocks and ash rained from the sky. The first helicopter crews into the blast zone reported they were unable to find Spirit Lake. They did not recognise it with its surface obscured by a mantle of floating logs and pumice.

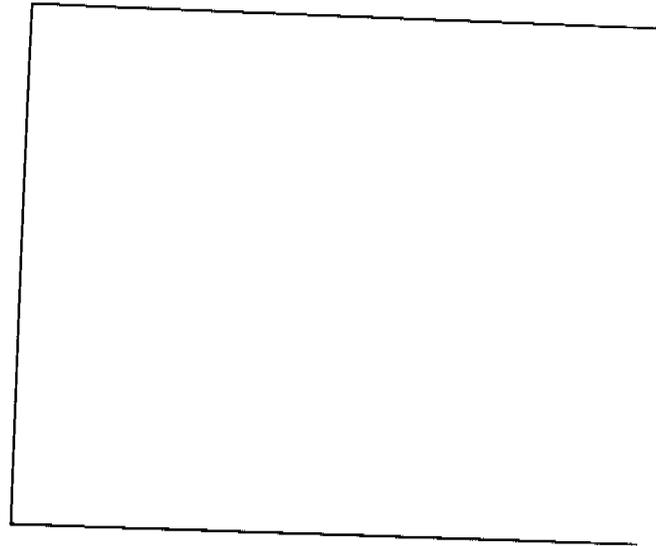
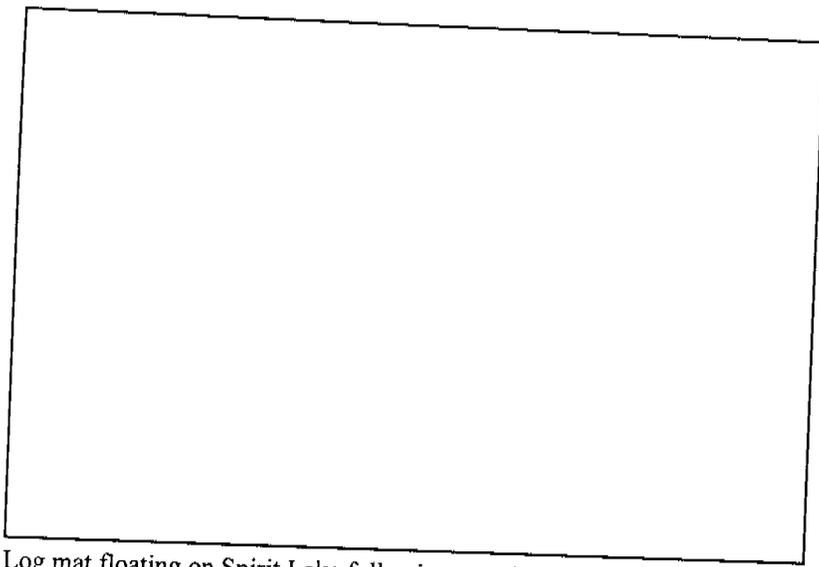
When scientists returned to Spirit Lake in June of 1980, they found it had been 'transformed into a roiling ['roil' = to stir, to make muddy], steaming body of degraded water choked with logs and mud.'<sup>1</sup> They predicted it would take 10–20 years to return to its 'pre-eruption chemical and biological condition.' As it turned out, it took closer to five! How did this happen so quickly?

After the eruption, Spirit Lake became a 'paradise' for microbes. Its waters, once cold (10°C = 50°F) and clear, became warm (over 32°C = 90°F) and muddy, laden with organic debris, mineral nutrients and other chemicals. Bacteria proliferated to an astounding degree in this broth, ultimately peaking at half a billion bacterial cells per millilitre—a 'concentration that is possibly unprecedented in the annals of environmental microbiology.'<sup>2</sup> For a time, the oxygen levels were so depleted by the decomposition activity that the lake could support only anaerobic (i.e. can live without oxygen) microbes. Spirit Lake thus bubbled like a cauldron from escaping carbon dioxide, methane and hydrogen sulfide generated by these bacteria in bottom sediments. For scientists visiting the area, the odour was overwhelming! However, the 'no oxygen' bacteria were crucial in decomposing the huge amounts of organic debris settling on the bottom of the lake during this phase of the recovery process.

Restoration was greatly hastened by the coming of the winter rains. This seasonal influx of fresh water diluted the concentration of toxic chemicals and raised oxygen levels. Wind, waves and seasonal lake turnover stirred in still more oxygen, enabling the return of oxygen-dependent microbes, which absorbed mineral nutrients from the water, and thus helped clear the lake of these and other chemicals. Water clarity improved, and with increased light penetration the phytoplankton reappeared. They produce food by photosynthesis and release oxygen as a by-product. Within just five years, the water quality had nearly returned to its pristine pre-eruption state—a remarkable transformation.

Keith Swenson

U.S. Geological Survey



Log mat floating on Spirit Lake following eruption disaster.

## References

1. Larson, D., The Recovery of Spirit Lake, *American Scientist* **81**(2):166, March–April, 1993. [Return to text.](#)
2. Ref. 1, p. 170. [Return to text.](#)

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## **Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:14 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 8 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** s NOVA Spirit Lake ccc.wmv

**From:** Dr. C. Hite [mailto:aaaptly@gmail.com]  
**Sent:** Sunday, October 28, 2012 2:52 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Re: 8 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Arguments against PG&E Seismic Study

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
805 5341232

To who it may concern;

I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

Destruction of living cells and organisms within the decibel path will create a nitrogen hot fertilizer of flotsam, which will reach our shores.

The Central Coast, most affected by the PG&E Seismic Survey, is already dealing with high bacteria challenges, which affects health and the local economy.

<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=bacteria+levels+pismo+beach>

### **Web Results**

#### **Beach Health Advisories - County of San Luis Obispo**

**Beaches** are posted with advisory signs and remain posted until sample results indicate that **bacteria levels** meet State standards. A **beach** closure occurs when ...

[www.slocounty.ca.gov/health/publichealth/ehs/beach.htm](http://www.slocounty.ca.gov/health/publichealth/ehs/beach.htm)

- **Pollution Source Tracking - Beachapedia**

May 12, 2011 ... As surfers and beach goers who care about the environment, we are becoming ... they evaluated three years of water quality data from **Pismo Beach**. Higher levels of **bacteria** were detected during the dry summer months than ...

[www.beachapedia.org/Pollution\\_Source\\_Tracking](http://www.beachapedia.org/Pollution_Source_Tracking)

- **Bacterial Pollution, Tracking the Sources - Beachapedia**

Apr 29, 2011 ... The results show that **Pismo Beach** has higher levels of **bacteria** during the dry summer months than during the winter when storm water is ...

[www.beachapedia.org/Bacterial\\_Pollution\\_Tracking\\_the\\_Sources](http://www.beachapedia.org/Bacterial_Pollution_Tracking_the_Sources)

- **CSU Sacramento - The California State University**

Jan 24, 2012 ... well as the physical and environmental factors that influence the levels of **bacteria** in the ocean waters at. **Pismo Beach**, California.

[www.calstate.edu/coast/documents/coast\\_boa\\_2012\\_web.pdf](http://www.calstate.edu/coast/documents/coast_boa_2012_web.pdf)

- **Pigeons charged with polluting Pismo Beach water**

Aug 10, 2010 ... Hundreds of pigeons roosting and defecating under the **Pismo Beach** Pier are being held accountable for the high **bacteria levels** in the ocean ...

[calcoastnews.com/2010/08/pigeons-charged-with-polluting-pismo-beach-water/](http://calcoastnews.com/2010/08/pigeons-charged-with-polluting-pismo-beach-water/)

- **PismoFinalReport-v1 4 - City of Malibu**

increases in the number of times warnings for high **bacteria levels** had to be posted for Pismo. Beach. The City of **Pismo Beach** (CPB) applied for funding from ...

[www.malibucity.org/download/index.cfm/fuseaction/download/cid/16031/](http://www.malibucity.org/download/index.cfm/fuseaction/download/cid/16031/)

- **Download - DigitalCommons@CalPoly**

warning people of high levels of potentially dangerous **bacteria** at **Pismo Beach**. Pigeons were suspected to be the culprit, but officials couldn't develop a ...

[digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1668&context=calpoly\\_magazine](http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1668&context=calpoly_magazine)

- **Cal Poly Magazine | Winter 2010**

Cal Poly students and faculty helped determine that pigeons, like this one, at the **Pismo Beach** Pier are causing high **bacteria levels** in surrounding ocean waters ...

[www.calpolynews.calpoly.edu/magazine/Winter-10/pigeons.html](http://www.calpolynews.calpoly.edu/magazine/Winter-10/pigeons.html)

• **Bacteria in San Luis Obispo County waters high | KSBY.com | San ...**

Oct 16, 2012 ... About 14 areas in the County showed a significant amount of water **bacteria**, including Avila, Shell, and **Pismo Beach**. All of the sites listed ...

[www.ksby.com/news/bacteria-in-san-luis-obispo-county-waters-high/](http://www.ksby.com/news/bacteria-in-san-luis-obispo-county-waters-high/)

Attached: s NOVA Spirit Lake ccc.wmv (video)

#

On Sun, Oct 28, 2012 at 2:13 PM, Dr. C. Hite <[aaaptly@gmail.com](mailto:aaaptly@gmail.com)> wrote:  
[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Formal Comments on Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
805 5341232

To who it may concern;

*Already included in the previous e-mail. cut*

I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

I have first hand knowledge of what the destruction of an aquatic eco-system looks like when it is truly unavoidable.

Attached: HITE-Mt-St-Helens-1981-001.jpg

Destruction of living cells and organisms within the decibel path will create an environment for bacteria, which depletes oxygen.

Destruction of the plankton = destruction of oxygen and the food source that supports marine mammals, including sea otter.

*Yes, the plankton will return,* but not before the interruption in the food chain contributes to starvation.

**Tagab, Clarita@Coastal**

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:14 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 9 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** LOWWP dewatering basin 10 16 12\_0002.wmv

**From:** Dr. C. Hite [mailto:aaaptly@gmail.com]  
**Sent:** Monday, October 29, 2012 1:01 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 9 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Arguments against PG&E Seismic Study

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To who it may concern;

I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

San Luis Obispo County, on the Central Coast, does NOT have control of its sewer projects. Spills of sewage and ineffective de-watering plans do and will flow to the ocean.

The Central Coast, most affected by the PG&E Seismic Survey, is already dealing with high bacteria challenges, which affects health and the local economy.

Destruction of living cells and organisms within the decibel path will create a nitrogen hot fertilizer of flotsam, which will reach our shores.

This will only increase the pollution from sewage spills and out-of-control waste water projects.

Attached: LOWWP dewatering basin 10 16 12

Public Comment and photographs of erosion at the newly constructed Los Osos Waste Water Project de-watering basin.

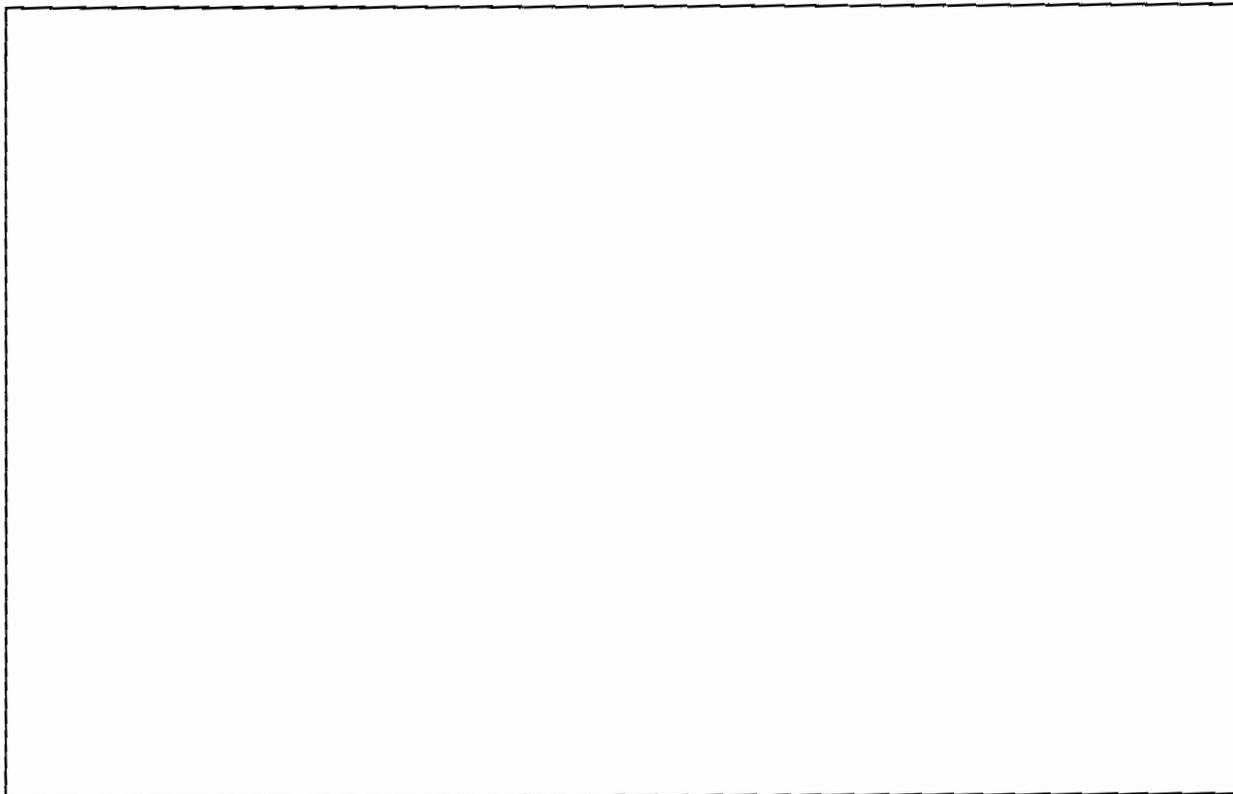
#

On Sun, Oct 28, 2012 at 3:24 PM, Dr. C. Hite <[aaaptly@gmail.com](mailto:aaaptly@gmail.com)> wrote:  
<http://www.sanluisobispo.com/2012/10/26/2276174/sewage-spill-beaches-closed.html>

**Planned seismic tests near Diablo Canyon on the agenda for Tuesday's Board**

## **Public warned to stay out of ocean at Avila Beach, Port San Luis after sewage spill**

Published: October 26, 2012



The Avila Beach Pier.

Joe Johnston — [jjohnston@thetribunenews.com](mailto:jjohnston@thetribunenews.com) Buy Photo

By Tribune staff — [newsroom@thetribunenews.com](mailto:newsroom@thetribunenews.com)

Raw sewage spilled into a San Luis Obispo creek Friday due to a blocked sewer line, and that in turned caused closures at Avila Beach and Port San Luis.

According to the San Luis Obispo County Public Health Department, the spill was reported at 4:20 p.m. by city officials. They discovered that a blocked sewer lateral near 1585 Calle Joaquin Road caused the spill. Approximately 1,000 gallons of raw sewage got into Froom Creek.

County Public Health workers responded and confirmed that the spill had ended. City crews began making repairs to the sewer line. Signs went up warning the public to stay out of the ocean at Avila Beach and Port San Luis. People were also advised to stay out of Froom and San Luis creeks in the area of Calle San Joaquin and Highway 101, as well as San Luis Creek all the way to its mouth at Avila Beach.

Read more here: <http://www.sanluisobispo.com/2012/10/26/2276174/sewage-spill-beaches-closed.html#storylink=cpy>

#

<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=slo+tribune+other+sewer+spills+on+central+coast>

## Web Results

- **State argues for fine against South County sewage district over ...**

Sep 7, 2012 ... By Cynthia Lambert — [clambert@thetribunenews.com](mailto:clambert@thetribunenews.com). UPDATE 1:20 a.m. Saturday: The **Central Coast** Regional Water Quality ... The board will meet in closed session on Oct. 3 in **San Luis Obispo** to deliberate. ... Original story: The cause, the volume and **other** circumstances surrounding a **sewage spill** in ...

[www.sanluisobispo.com/2012/09/07/2216530/south-county-sanitation-district.html](http://www.sanluisobispo.com/2012/09/07/2216530/south-county-sanitation-district.html)

- **Criminal charges possible for 2010 Oceano sewage spill | Local ...**

Aug 22, 2012 ... Tracking otters along **SLO** County's coast ... By Cynthia Lambert — [clambert@thetribunenews.com](mailto:clambert@thetribunenews.com) ... A civil liability hearing before the **Central Coast** Regional Water ... The sanitation district and state water board reached an impasse after negotiating for months on the amount of the **spill**, the fine and **other** ...

[www.sanluisobispo.com/2012/08/22/2196219/criminal-charges-possible-for.html](http://www.sanluisobispo.com/2012/08/22/2196219/criminal-charges-possible-for.html)

- **Treatment plant to be fined \$1.1 million for Oceano sewage spill**

...

Oct 3, 2012 ... South **San Luis Obispo** County Sanitation District will be fined about \$1.1 million for a **spill** in Oceano in December 2010 that **spilled** thousands of gallons of **sewage**. ... Cynthia Lambert **The Tribune** ... The penalty was levied after the **Central Coast** Regional Water Quality Control Board found that the South ...

[www.sanluisobispo.com/2012/10/03/2250287/south-county-sanitation-district.html](http://www.sanluisobispo.com/2012/10/03/2250287/south-county-sanitation-district.html)

#

<http://www.sanluisobispo.com/2012/09/07/2216530/south-county-sanitation-district.html>

## State argues for fine against South County sewage district over Oceano spill

Published: September 7, 2012

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Sewage treatment plant argues against a proposed \$1.3 million fine from the state water board for December 2010 incident

By Cynthia Lambert — [clambert@thetribunenews.com](mailto:clambert@thetribunenews.com)

**UPDATE 1:20 a.m. Saturday:** The Central Coast Regional Water Quality Control Board delayed a decision on whether to uphold a more than \$1.3 million fine against a South County sewage treatment plant for a spill in Oceano in December 2010.

The board will meet in closed session on Oct. 3 in San Luis Obispo to deliberate.

“We have briefly discussed what to do and we all need time to talk about this,” board chair Jeffrey Young said early Saturday morning after hours of testimony. “It cannot be shoehorned in.”

State water board prosecutors had proposed the South San Luis Obispo County Sanitation District be fined more than \$1.3 million in connection with the spill in Oceano on Dec. 19-20, 2010.

The regional board heard testimony starting at 8:30 a.m. Friday to determine whether the sanitation district should have to pay the proposed penalty.

The state water board prosecution team and the sanitation district each had time to present their case and examine witnesses.

In her closing argument, the sanitation district’s attorney urged the board to decrease the fine. Melissa Thorne of Sacramento-based Downey Brand said the district took steps to protect the treatment facility during the spill, took remedial measures and has not had any other spills in 25 years.

“The prosecution team failed to show that the district spill volume was unreasonable,” she said. “They just said they would do it differently.”

She also argued the proposed fine was not consistent with other penalties assessed to treatment plants elsewhere in California.

In response, Julie Macedo, senior staff counsel for the state water board’s Office of Enforcement, argued the sanitation district had years to properly budget funds for projects to address problems.

“Delayed maintenance issues are not acts of God,” Macedo said. “There were several unresolved issues that were known and should have been repaired prior to the spill.”

**Original story:** The cause, the volume and other circumstances surrounding a sewage spill in Oceano in December 2010 were debated Friday during a daylong hearing that pitted state water board prosecutors against attorneys for a South County sewage treatment plant.

The state water board has proposed a more than \$1.3 million penalty against the South San Luis Obispo County Sanitation District in connection with the event that spilled thousands of gallons of sewage on Dec. 19-20, 2010.

The Central Coast Regional Water Quality Control Board, which will decide whether the fine stands, did not issue a decision by press time Friday night.

The testimony ranged from the root cause of the spill, to the amount of sewage that spilled from the plant, to whether the district has enough money to pay the proposed fine — all issues upon which state water board prosecutors and the district's attorney disagreed.

The board also heard from local residents who are worried the fine would be passed on to ratepayers through increased sewer bills. Some urged the fine be lowered.

“Oceano has a lot of poor people, and I don't care what you say, the rates will be raised,” said Oceano resident Larry Bross.

Some residents believe that flooding, which preceded the spill, was caused by improper maintenance of the nearby creek channel and lagoon and that the water board should have involved the county in its investigation.

“The flood wasn't caused by the sewer plant,” said Karen White, a Halcyon resident. “The flood was caused by the Oceano Lagoon and Meadow Creek.”

The wastewater treatment facility, constructed in 1965, serves about 38,000 residents in Arroyo Grande, Grover Beach and Oceano.

During her opening statement, state water board prosecutor Julie Macedo argued the penalty is “fair, appropriate and necessary.”

Macedo said she hoped the regional board would send a message that it's better to deal with problems as they arise rather than let them pile up and lead to a spill.

The state prosecution team alleges the spill was caused by human error, including a lack of preventative maintenance at the plant. They say the district could have prevented it if a project to install waterproof electrical wiring had been completed when originally proposed in 2004.

District officials have said the maintenance project, which has now been largely completed, would not have prevented the spill.

Heavy rain preceded the Dec. 19, 2010, spill, when floodwater flowed into the treatment plant and caused an electrical short that shut down four influent pumps about 10:30 a.m.

The district argues three factors — the storm, the electrical failure and an inadvertently closed valve — were unintentional and beyond the district's control.

“It was really what you could call the perfect storm of events; ones that you could not have foreseen in advance,” said Aaron Yonker of Wallace Group, who testified for the sanitation district.

However, Jeff Appleton, who was the plant superintendent at the time of the spill, testified he told sanitation district officials about wiring problems and other issues at the plant, which were discussed but not fixed.

Appleton, who testified as a witness for the state prosecution team, is on administrative leave from the district.

Appleton also said he stands by his initial spill estimate of 2.25 million to 3 million gallons. He said district Administrator John Wallace and one of Wallace's employees tried to get him to deviate from that amount.

District officials disagreed and noted they submitted Appleton's estimates to the state along with their own.

The sanitation district modified its spill volume estimate in May to 417,298 gallons. A district consultant estimated a larger spill amount, but it was still about 400,000 gallons less than the state water board estimate.

The state water board concluded the volume of the spill was more than 1.1 million gallons.

Also discussed Friday was whether the district has the ability to pay the fine. An economist with the state water board said the district can pay because audited financial statements from previous fiscal years show it had a more than \$5 million surplus.

"The ability to pay by the district is adequate to cover the proposed (fine) without any kind of impact on ratepayers," Gerald Horner said.

The district's attorney opposed Horner's conclusion, arguing the statements are several years old and do not reflect the district's current situation.

The district does not have enough money in unrestricted funds to cover the fine this fiscal year, said Melissa Thorne, a Sacramento-based attorney representing the wastewater treatment plant. Paying the fine would leave the district about \$260,000 in the red as of next July 1.

"We're now two years later and as everyone knows your financial situation can change quickly," she said.

*Reach Cynthia Lambert at 781-7929. Stay updated by following [@SouthCountyBeat](#) on Twitter.*

Read more here: <http://www.sanluisobispo.com/2012/09/07/2216530/south-county-sanitation-district.html#storylink=cpy>

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<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=slo+tribune+cmc+sewer+spills+on+central+coast>

## Web Results

- **[We are San Luis Obispo County's on-line independent news source ...](#)**

**SLO sewage spill** closes Avila Beach. Port San Luis ... [Tribune] Irene Martinez, 39,. ... 28th Annual **Central Coast** Writers' Conference, event photos after party ...

[calcoastnews.com/](http://calcoastnews.com/)

- **KSBY Action News NBC 6 : Central Coast - Page - Channel ...**

**Central Coast** - Page - Channel - Calendars - Snapshots - Business Listings - Post .... 1,000 gallons of raw **sewage spilled** into Froom Creek in **San Luis Obispo**

[www.centralcoastpage.com/modules/KSBY/index.php?page=eachpipe&pipe\\_id=1](http://www.centralcoastpage.com/modules/KSBY/index.php?page=eachpipe&pipe_id=1)

- **San Luis Obispo County Proposition 1E Proposal - Department of ...**

**San Luis Obispo** newspaper, The **Tribune**, "Sewage treatment plants in **San Luis** ... Approximately 300,000 gallons of raw **sewage spilled** into creeks from .... As reported in The **Tribune**, May 29, 2005 from data provided by the **Central Coast** RWQCB. ... upgrade project was brought on-line in January 2006; the **CMC** WWTP ...

[www.water.ca.gov/irwm/docs/ResourcesLinks/Submitted\\_Applications/PIE\\_Round1\\_SWFM/San%20Luis%20Obispo%20County%20Flood%20Control%20and%20Water%20Conservation%20District/Att13\\_SWF\\_Strmrespln\\_1of1.pdf](http://www.water.ca.gov/irwm/docs/ResourcesLinks/Submitted_Applications/PIE_Round1_SWFM/San%20Luis%20Obispo%20County%20Flood%20Control%20and%20Water%20Conservation%20District/Att13_SWF_Strmrespln_1of1.pdf)

- **Appendix - Morro Bay National Estuary Program**

**Central Coast** Ambient Monitoring Program. CCC ... **Central Coast** Regional Water Quality Control Board. CDA... **San Luis Obispo** County Department of Environmental. Health. DO ... Office of Oil **Spillage** Prevention & Response (DFG) ... the discharge from a **sewage** treatment plant or a factory is a point source.

[www.mbnep.org/Library/Files/CCMP/appendix.pdf](http://www.mbnep.org/Library/Files/CCMP/appendix.pdf)

- **February 06, 2006 - County of San Luis Obispo**

Feb 6, 2006 ... Eric Greening, Atascadero, concerned with rate of **sewage spills** of various sizes increasing and question if our County has a **central** repository for the public to report symptoms after ... clinics, **CMC** and **ASH**. ... the **Central Coast** Dental Society quoted an article in The **Tribune**, "tooth decay is by far the most ...

[www.slocounty.ca.gov/Assets/PH/HealthCommission/Minutes/06Feb06M.pdf](http://www.slocounty.ca.gov/Assets/PH/HealthCommission/Minutes/06Feb06M.pdf)

- [www.mbnep.org/Library/Files/CCMP/appendix.pdf](http://www.mbnep.org/Library/Files/CCMP/appendix.pdf)
- [www.slocounty.ca.gov/Assets/PH/HealthCommission/Minutes/06Feb06M.pdf](http://www.slocounty.ca.gov/Assets/PH/HealthCommission/Minutes/06Feb06M.pdf)

#

<https://isearch.avg.com/search?cid={F6FBD5A1-DBED-4A16-AAEC-6CE53E47EE33}&mid=c0caaf6c40b547d6aa7141b2e00444d5-9e62f5f3df670fd2b1ece863d50da82cbe1f4817&ds=AVG&lang=en&v=10.2.0.3&pr=pr&d=2011-09-29%2011:12:48&sap=dsp&q=LOWWP+tri+w+de+watering>

## Web Results

- **Statement of Key Environmental Issues Los Osos Wastewater ...**

e.g., **dewatering**, soil stabilization, and street reconstruction. ... Wastewater Treatment Project (**LOWWP**) Update, Chairman Patterson requested that ..... 23 cubic yards) to accommodate the 1,500 gallon tank measuring 6'W x 11'L x 6.25' D.23 To ..... For further elaboration on the **tri**-metrics of Sustainability see, for example, ...

[www.slocounty.ca.gov/Assets/PW/LOWWP/BOS+Related+Items/KEIS+Document.pdf](http://www.slocounty.ca.gov/Assets/PW/LOWWP/BOS+Related+Items/KEIS+Document.pdf)

- **Project Status Report - County of San Luis Obispo**

Feb 25, 2009 ... <http://www.slocounty.ca.gov/PW/LOWWP.htm> ..... The advantages of the **Tri-W** site are that it is central to the collection system and ... costs and has greater impacts of construction, i.e. trenching up to 23 feet, **dewatering**, and ...

[www.slocounty.ca.gov/Assets/PW/LOWWP/document+library/2-25-09+Project+Status+Report.pdf](http://www.slocounty.ca.gov/Assets/PW/LOWWP/document+library/2-25-09+Project+Status+Report.pdf)

- **Collection System - SLO Green Build**

To achieve sustainability the collection system for the **LOWWP** should: ... e.g., **dewatering**, soil stabilization, and street reconstruction. .... 23 cubic yards) to accommodate the 1,500 gallon tank measuring 6'W x 11'L x 6.25'D.23 To ..... For further elaboration on the **tri**-metrics of Sustainability see, for example, Assemblyman ...

[www.slogreenbuild.org/Library/documents/general/KEIS%20Collection%20Final.pdf](http://www.slogreenbuild.org/Library/documents/general/KEIS%20Collection%20Final.pdf)

#

Attached: LOWWP dewatering basin 10 16 12

**Tagab, Clarita@Coastal**

---

**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:15 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 10 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** 12-HITE-CD-Seismic.jpg; HITE 7 .0 SocioEco.doc; HITE Baywood bus rider.JPG; HITE Baywood erosion.JPG; HITE LO Farmers Fish f.JPG; HITE Homeless woman Los Osos.JPG; HITE Los-Osos Baywood.jpg; HITE sewer unaffordable.JPG; HITE-jpg-TSing.jpg

**From:** Dr. C. Hite [<mailto:aaaptly@gmail.com>]  
**Sent:** Monday, October 29, 2012 1:41 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 10 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Arguments against PG&E Seismic Study based on the EIR

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To who it may concern;

As a PG&E rate-payer I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

Environmental Justice has yet to be addressed by our own representatives of the Central Coast.

<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1563/RXhoaWJpdf82LnBkZg==/12/n/9635.doc>

Low income coastal constituents are mentioned in the EIR to be residing in Los Osos and Morro Bay, (which are National Estuary communities).

However, neither the SLO County Board of Supervisors as a whole, nor our coastal representative Dr. Bruce Gibson has considered the double impacts of Seismic Survey and waste water projects.

In addition; Environmental Justice was inadequately addressed by the EIR. Image Attached: [12-HITE-CD-Seismic.jpg \(image/jpeg\) 179K](#)

Word document Attached: [HITE 7 .0 SocioEco.doc \(application/msword\) 39K](#)

To include; Comments on Seismic Survey - Socio Economic Effects and Environmental Justice

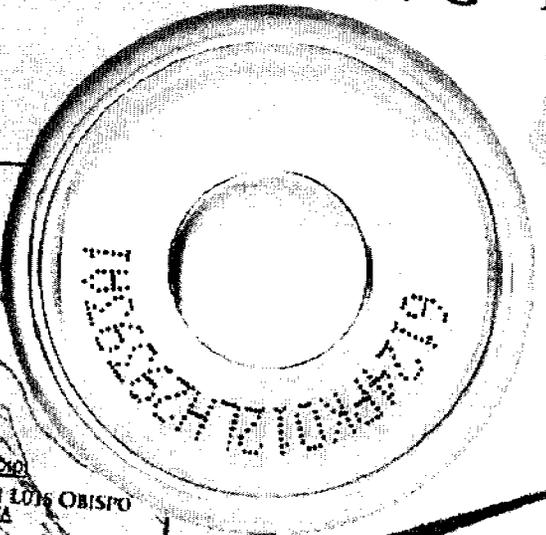
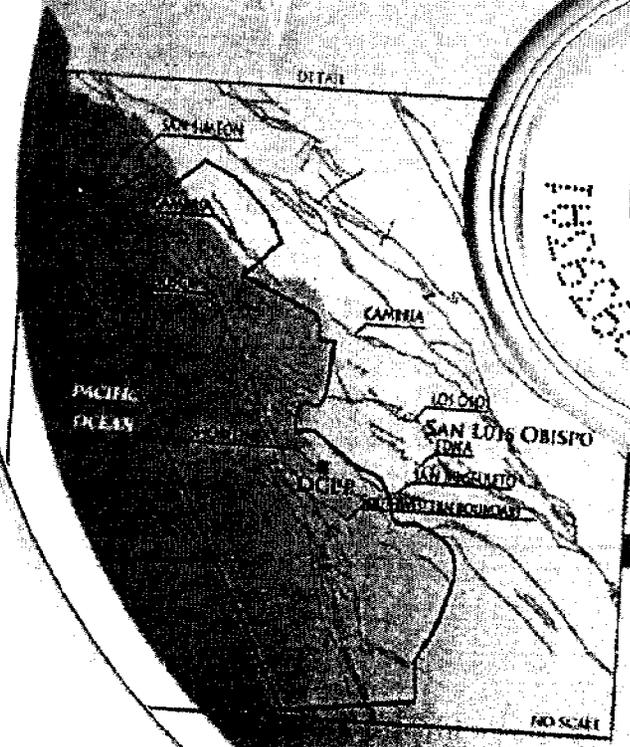
Supportive jpeg files attached;

Baywood bus rider, Baywood erosion, Los Osos farmers market (fish), Homeless woman Los Osos, Los Osos Baywood, sewer unfordable, and photograph by T. Sing of child in diaper fishing

#

FINAL  
ENVIRONMENTAL  
IMPACT REPORT (EIR)  
STATE CLEARINGHOUSE NO 2011061085  
CSLC EIR NO. 758

FOR THE  
CENTRAL COASTAL CALIFORNIA  
SEISMIC IMAGING PROJECT



PREPARED FOR  
CALIFORNIA STATE LANDS COMMISSION  
JULY 2012

## Comments on Seismic Survey

### 7.0 Socio Economic Effects and Environmental Justice

I have advocated before the San Luis Obispo County Board of Supervisors since 2003, specifically about Socio Economic factors and equity within San Luis Obispo County. 34,783 individuals are noted in the EIR below the poverty line. The large populations of homeless persons are NOT counted in the U.S. Census. Therefore the socio-economic data concerning medium income and poverty level is misleading and invalid, as people are people. There is a homeless census or "enumeration" in San Luis Obispo County, which is not mentioned nor duly noted in consideration of social or environmental justice. (Jpeg file Homeless woman, Los Osos enclosed).

16. ...*ALL people, regardless of their race, color, nation or origin or income – are able to enjoy equally high levels of environmental protection.*

At this point I am bound to advocate for the disadvantaged population of Los Osos, Oceano, Grover Beach, Morro Bay and other minorities, including the indigenous peoples; the Nation of Chumash and Coastal peoples, as well as the historic Portuguese. San Luis Obispo County is an exclusive, almost all white county. The diverse choose to live and share in the rich environmental resources of the Central Coast, with little encouragement. The economic impact of the Seismic study will be multiplied upon those below the poverty line and those who fall through the cracks of non-recognition. I have come to the conclusion that the Seismic study is not just an environmental and economically disaster for the Central Coast, it is a potential abuse of the protected class of people within. Therefore I am bound to report such abuse and my comments and continued community participation in this matter will include such reporting.

The largest fallacy I see is that PG&E, a "commercial" interest, is going to try to mitigate damages by compensating another commercial interest; fishermen. Only well established commercial fishermen who can prove their yearly profits will be compensated, which prohibits *newness*. The Seismic Study will deplete resources of an already depleted industry as noted. We have combination Fish and Farmers Markets all up and down the coast, including Los Osos, Baywood Park. Going to the Farmers Market is not just the healthy choice, it is our community participation and it supports the local farmers and sea food vendor. (Jpeg file Baywood Farmers Mrkt, enclosed).

We also have fishing on the nearby pier and many other piers. Fishing on piers is economical because it is free and this serves the interest of the traditional peoples and the poor. The EIR is dismissive of "dock" fishing and does not address whether or not the fish will "bite" while disturbed by the Seismic testing or if they will be driven out of the area.

Example; Wednesday, September 19<sup>th</sup> the weather was so warm in Pismo Beach and the Farmers market was setting up by the pier. Among the numerous people fishing was an elder Portuguese man and his young adult daughters. The daughters had hooked a Perch and struggled with the hook until the father, with his experience, remedied the matter. Fathers worry about their daughters, but a father who teaches his daughter to fish can be confident she can feed herself. Affluent fathers, typically do not have this worry, but practical fathers do. My father taught me to fish as a child and I taught my child to fish, while he was still in diapers. (jpeg file enclosed). The Seismic study will in NO way compensate everyman and every woman, child and grandchild who find the familial tradition of fishing a way of life and not just a hobby or commercial venture. There is NO way to calculate the value and the loss for what is a daily life activity for some.

#### 7.1-1

According to the U.S. Census, Los Osos is a diverse, low income community with a demographic of senior-disabled on fixed income. There are low income areas of Oceana and Grover Beach, with a demographic of disabled in Arroyo Grande Village. The Seismic Study will disproportionately impact an already overburdened population. Averaging the income of the many wealthy residents, in NO way elevates the condition of those below the poverty level. Many fixed income residents live below \$12,000 annually compared to the \$56,000 to \$57,000 medium income noted, (which is noted to be below the California average). In addition, many benefits have been discontinued or reduced since the economic downturn, including homeowner-renters credits, In Home Supportive Services and SSI, SSDI for the aged and disabled. The economic impacts of Seismic testing could make the already tenuous position of the economically disadvantage and diverse population hopeless. Los Osos may lose its USDA loan, expected for home repairs and the new sewer connection. (Jpeg file Sewer, unaffordable, enclosed). The Central Coast could become like a *gated community*. Over the years San Luis Obispo County has declared a health care "crisis," affordable housing crisis, human services crisis,

transportation crisis and now a homelessness crisis. Although funds have been raised, plans to begin a much needed homeless shelter have recently been put on hold. A study by local Cal Poly found hunger and food insecurity in this, one of the richest Counties in California. The EIR does not note the known food insecurity in San Luis Obispo County and the ocean is an available food source. The Ocean is our way of life and will be greatly impacted, as will the people who rely upon it for their health, their well being, and their livelihood. There will be NO study to see if the loss of access to and enthusiasm for our ocean will decrease commerce at our coastal Fish and Farmers Markets where our thriving artist community relies on art sales for their income. There is no notation in the EIR under economic effects and environmental justice concerning the many scheduled events like the Pismo Beach Clam Festival in October.

Los Osos, Baywood is already experiencing closing businesses due to the high assessment costs of a new sewer. As businesses close, people are laid off. This economic hardship will be multiplied by the Seismic testing. 82 days of a downturn in tourism and local activity can put a struggling business in a hopeless position. 82 days of a downturn in tourism and local activity can put minority hotel and restaurant workers into layoffs.

I dispute that the *project would not affect local employment*. It cannot be ignored that California is broke and the nation is struggling to get out of the worst recessions since the great depression. If one of our grocery stores closes, due to a sudden and prolonged (82 days), there will be less competition and less availability to the lower, fixed income residence, especially the retired and disabled who do not drive. Our transportation is already impacted in Los Osos and will be further impacted when trenching starts for the sewer. (jpeg file Trenching, enclosed). If we can't stand the noise decibels from our sewer construction, getting away to the ocean and waterfront activities will be no place to retreat. It remains unaddressed; the profound sadness that our oceans, our way of life, is not available to us and that sea life may be tormented; driven away or irreparably harmed. This angst is not conducive to considering an outing at the ocean, which precludes any related purchases, like restaurants, etc. (Jpeg file Los Osos Baywood, enclosed). The EIR "Socio Economic Effects and Environmental Justice" included NO photos of the affected areas, the thriving ocean and waterfront related businesses and activity. Activity is potentially economic activity and is therefore considered abstractly in the EIR and NOT realistically.

## Analysis

I dispute that 82 days is “short term.” 82 days is over two months.

## Community Involvement

Two meetings were held in the City of San Luis Obispo. The Seismic survey will cover a vast area of the Central Coast and communities are wide spread. The economic justice of the economically disadvantaged would include persons in far reaching communities who are reliant and yet underserved by public transportation. (Jpeg file Baywood bus rider, enclosed). Numerous person spoke against our coastal Board of Supervisor, Bruce Gibson’s nomination for the Coastal Commission, based on the following; he pushed to have bus stops cut out at our natural coastal resources like Sweet Springs and Baywood Park.

Two meetings in San Luis Obispo, which is *inland* and NOT a coastal community, was inadequate. NO meetings were held in the locations facing the greatest impacts and having the highest minority population.

## Recreational Resources

I dispute that subsistence fishing from beaches and docks would NOT be affected by the survey project. It is unpredictable what adverse effects the decibel path will have on the aquatic food chain. There will be NO normalcy. The waters off the Central Coast will NOT be a hospitable place for wildlife, including fish. The seismic testing will disrupt patterns, feeding habits and availability of viable krill and plankton.

Again, 250 decibels that have been stated on public broadcasts is important information that should have appeared in every aspect of consideration of the economic and safety effects of this Seismic study. Of course, concussive sound will dissipate, eventually. But concussive sound waves are damaging, especially in water. I have spoken about a *decibel path*. I am not referring to all life in the surrounding area or the “vicinity” of the survey, I am speaking of direct contact with a decibel level, which will damage, and irreparably harm life forms. I must assume that if 180 dp can kill a human in water, than anything with organs, and a sensitive navigation system will be rendered dysfunctional. We can expect a nitrogen hot fertilizer of biological

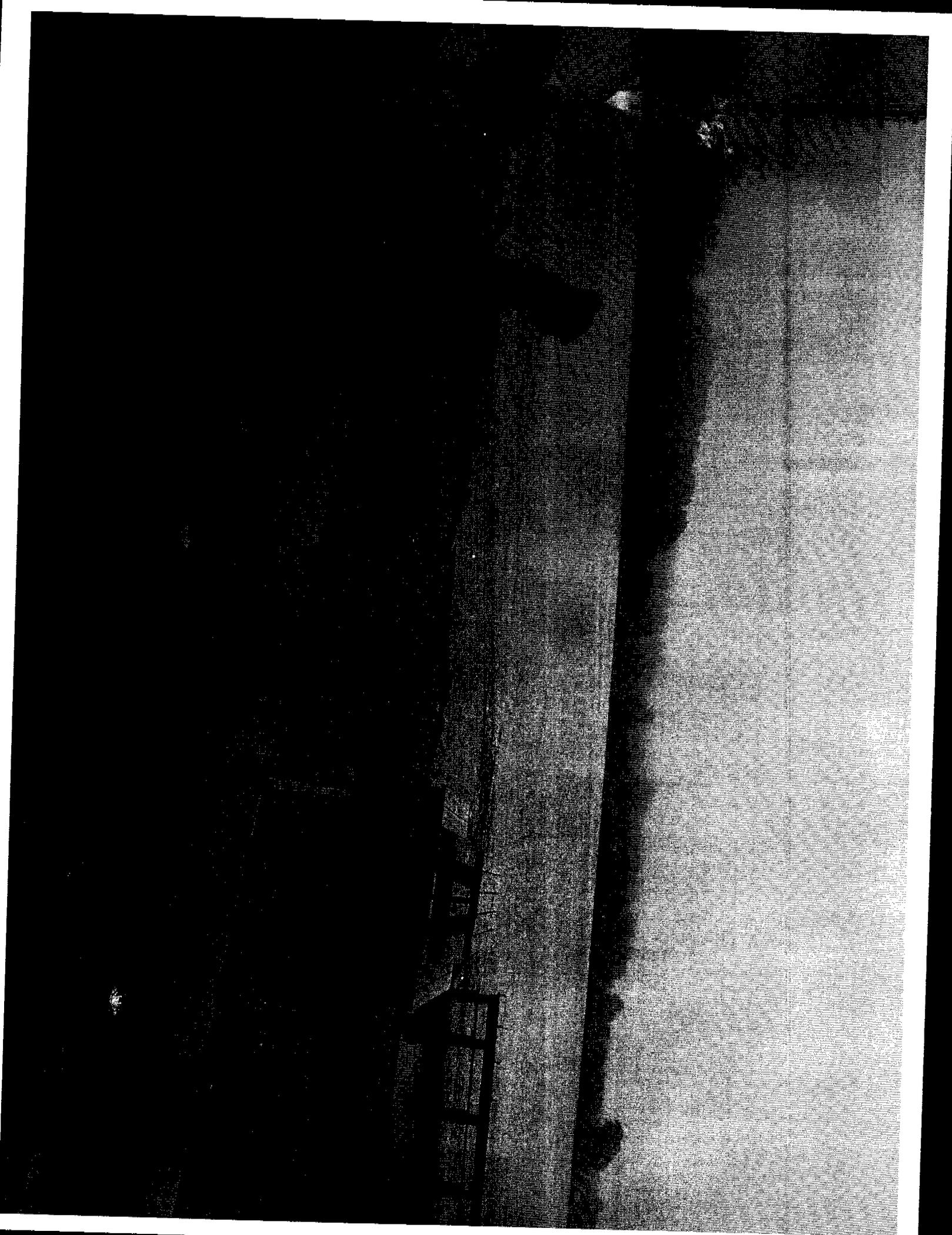
flotsam to wash ashore in our back bay and protected National Estuary. (Jpeg file erosion, enclosed). This nitrogen rich flotsam will be washing ashore at the same time the Los Osos sewer de-watering plan will be sending nitrogen contaminated ground water toward the Back Bay and estuary. There is currently planting efforts of natures nursery; eel grass, depleted in the Back Bay and possibly from the March 2011, Tsunami.

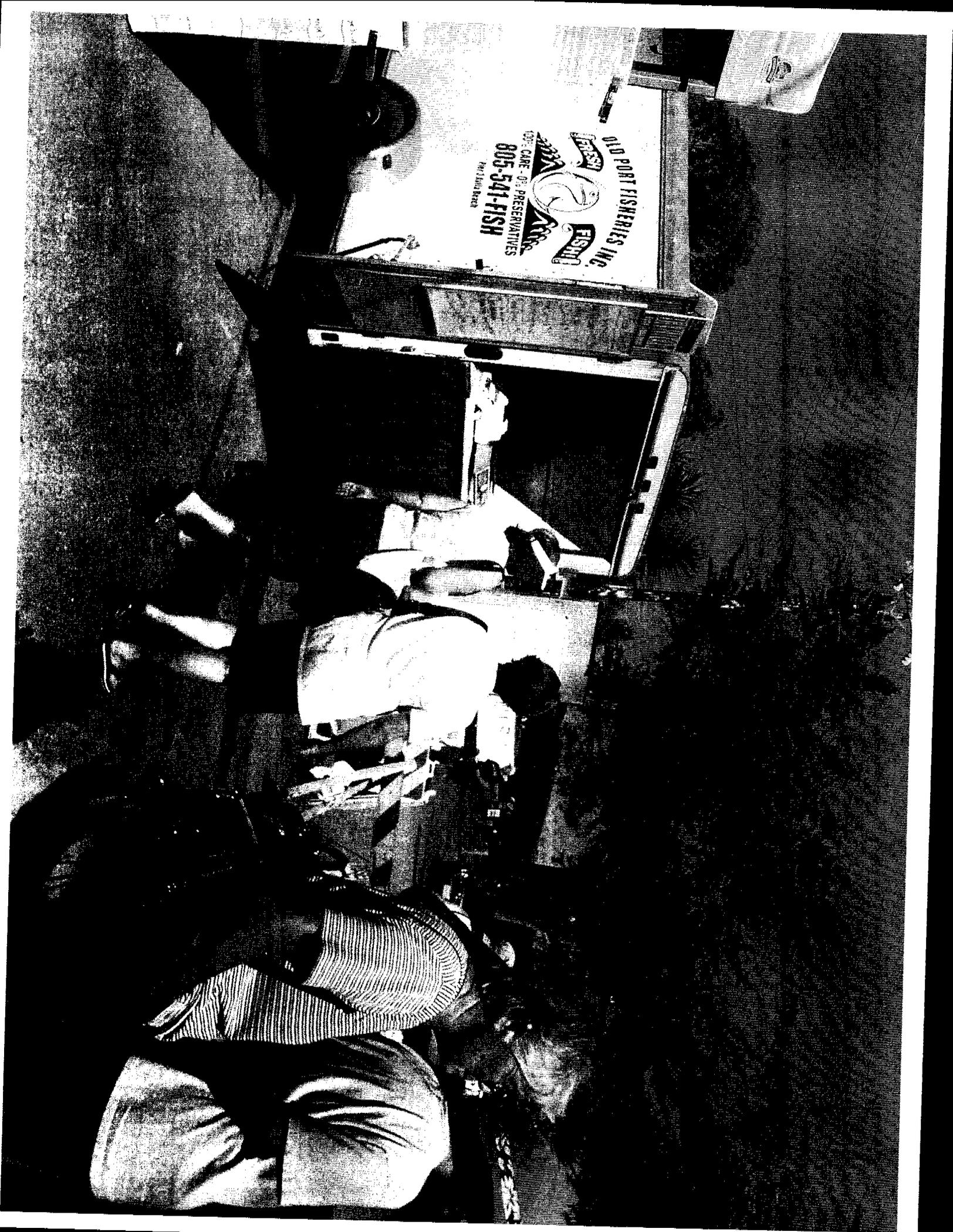
Seismic survey is NOT a misnomer. The *test is seismic in nature*. When we considered a test that would give answers to the condition of the fault lines, we did NOT consider that the test itself would register on the Richter scale. The holdfasts that secure the kelp beds will be dislodged, just as they are in a storm. An underwater landslide could be triggered. The food chain will be disrupted. Abalone are mentioned but there is no consideration if the blasts will kill them or disrupt there food source, as well as urchins, shrimp, crab and other sea life that cannot swim away. Abalones are just starting to make a come back after being depleted from the California Coast. I saw no mention of effects on the coastal Abalone farm, which is in essence, a nursery. There are nurseries in the decibel path, which will be disrupted.

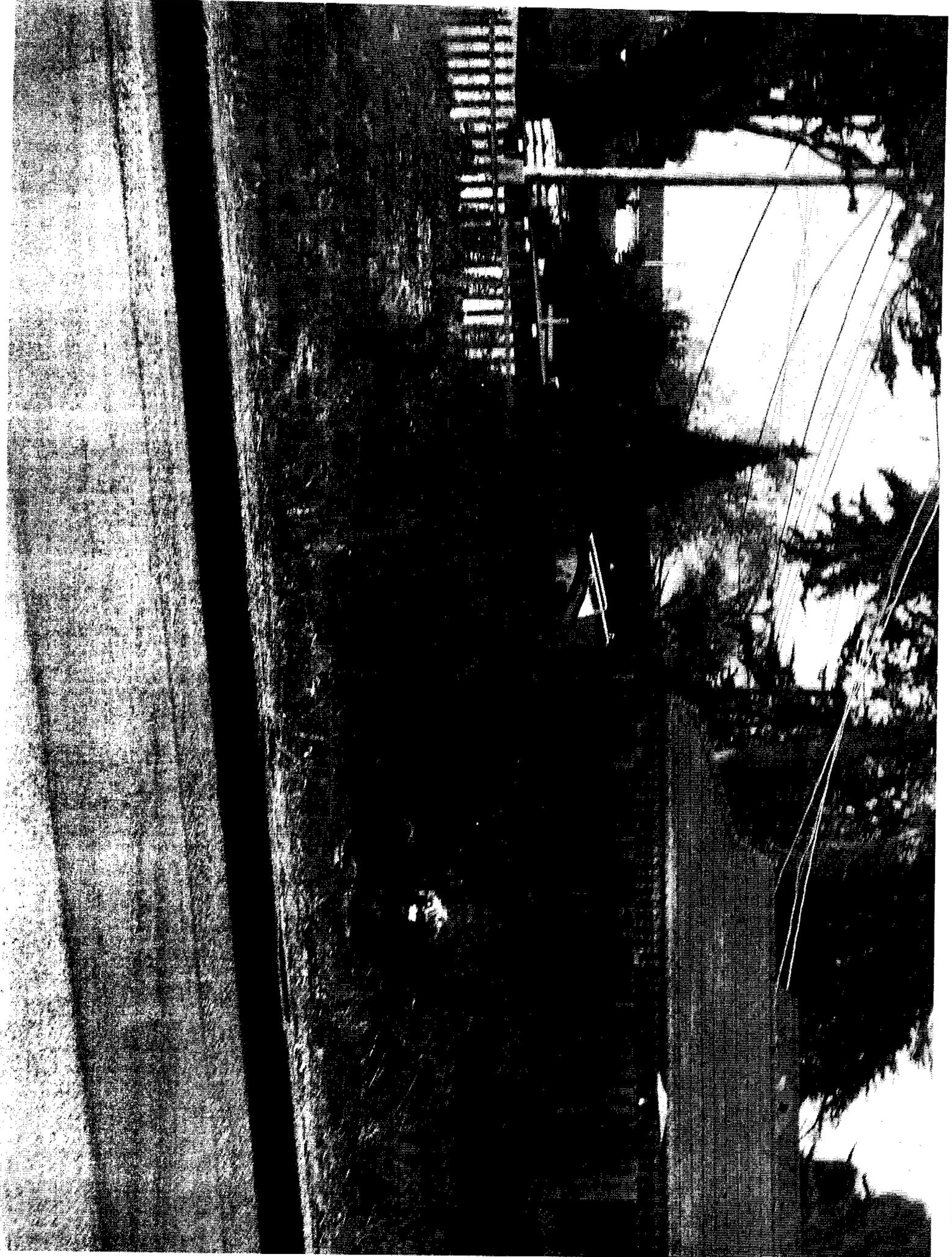
I dispute any insinuation in the EIR that the Seismic survey will NOT have a significant and profound impact on life and life forms of the Central Coast. This insinuation has allowed an impractical approach to a practical assessment. A practical assessment was needed. The consequences of this Seismic study will be uncorrectable without a sensible, practical approach. Unforeseen and uncorrectable consequences will be yet another "crisis" for the Central Coast as well as California.

Bringing life, *as we know it* to a standstill on the Central Coast for 82 consecutive days is unprecedented. We have NO comparison except for natural disasters like Katrina and the gulf oil spill. The lack of comparison enables the trivialization of the importance of daily life activities on the coast and invalidates the conclusions of NO significant impacts.

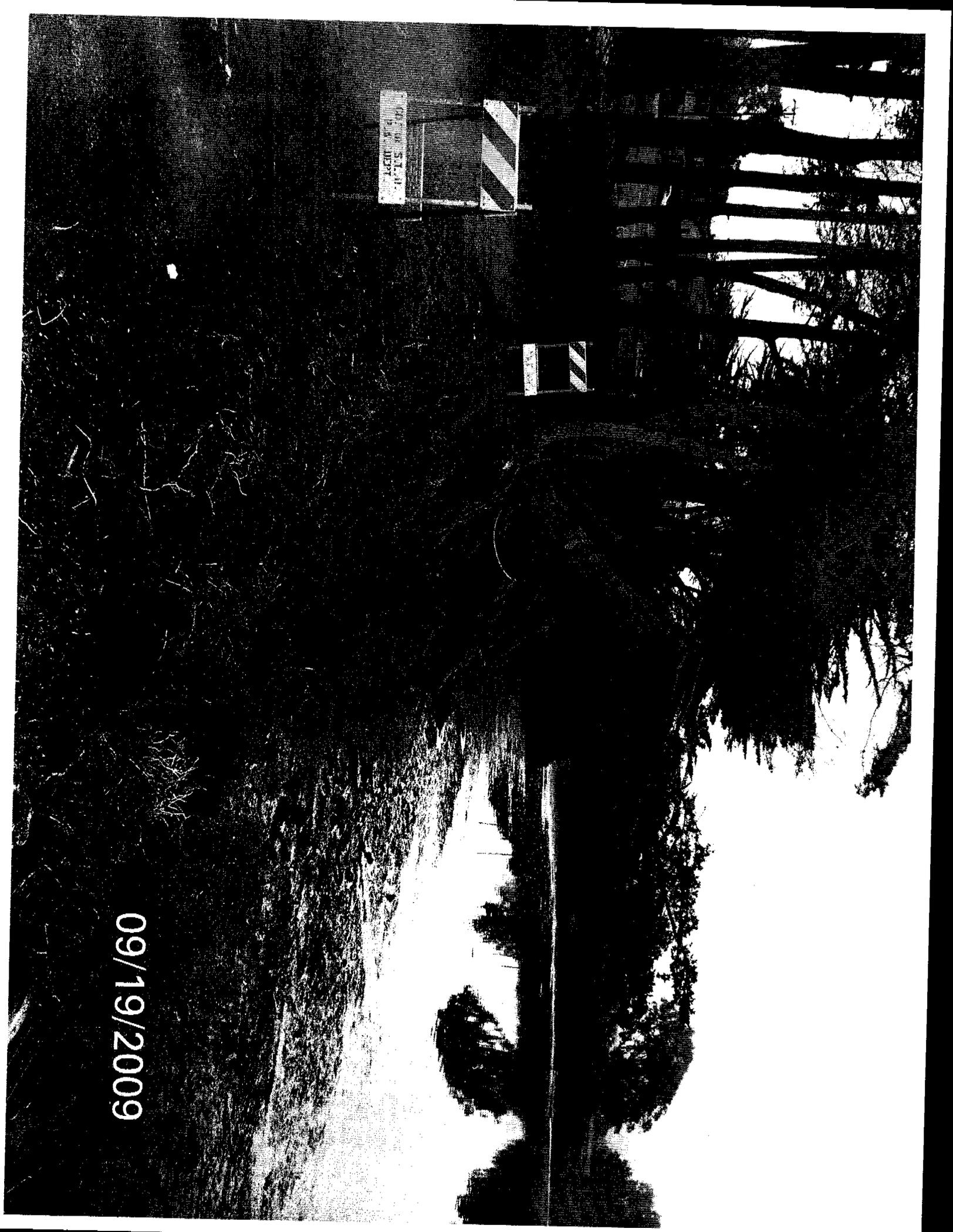
Dr. C. Hite, Los Osos  
World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443







09/19/2009



**Tagab, Clarita@Coastal**

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:15 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: 11 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit  
**Attachments:** HITE 4.11 Noise.doc

**From:** Dr. C. Hite [<mailto:aaaptly@gmail.com>]  
**Sent:** Monday, October 29, 2012 2:04 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 11 Opposition to PG&E Seismic Study: Consistency Certification and Coastal Development Permit

[Cassidy.Teufel@coastal.ca.gov](mailto:Cassidy.Teufel@coastal.ca.gov)

California Coastal Commission

RE: Arguments against PG&E Seismic Study based on the EIR

by Dr. C. Hite, Los Osos

World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443  
[aaaptly@gmail.com](mailto:aaaptly@gmail.com)  
[805 5341232](tel:8055341232)

To who it may concern;

As a PG&E rate-payer I conscientiously object to further Seismic Study on the Central Coast of California for the following reasons;

I disagree with the EIR on the issue of "noise."

Attached: HITE 4.11 Noise.word document

#

## Comments on EIR

A Seismic study project emitting 250 decibels has been reported at public meetings.

250 decibels is the most important fact in all the data, and yet I had to search to confirm the decibels (db). By comparison; the number of decibels that could kill a human in the water is the second most important fact, and I have yet to find it. I am focusing on “concussive” sound vs sound intensity in my comments on 4.11

### 4.11 Noise

“Noise” is poorly defined.

We are talking about concussive sound. Concussive sound will stun, disorient and can cause a “concussion.”

#### 4.11-1

I believe the “seismic airgun array” will most approximate the concussive sound of large mortar cannons.

I have unavoidable personal, close proximity experience with mortar cannons firing in Taiwan. I have personal, close proximity experience with mortar cannons firing while submerged in ocean waters. I have unavoidable personal, close proximity experience during the shelling of Taiwan. There is NO decibel (db) listing for Mortar cannon, which is an explosive, concussive sound. The only “explosive” sound on chart 4.11-1 in the EIR is pile driving and underwater explosion.

My father was a military Advisor to Taiwan. I have personal, close proximity experience with low flying aircraft, (prop). It is known that a single exposure to a jet engine on a flight deck can damage hearing. I have unique personal experience from being on airbases with super-sized B-52 landings and take off, as well as supersonic aircraft. *You do not just hear it, you feel it.* A military jet plane, throwing on afterburners while on the ground, emits a concussive sound. A sonic boom and double sonic boom (space shuttle), emits a concussive sound. *Suddenness* is a factor as it relates to the Seismic testing.

I have been told, but cannot prove; that when the flight test that first broke the sound barrier was considered at Edwards A.F.B there was fear the test would destroy the ozone. It was believe there could be a catastrophic cascade effect in the inner atmosphere, but someone or someone's decided to do it anyway.

*There is a potential for a catastrophic cascade effect within the ocean from the seismic testing.*

I have unavoidable personal experience being in relatively close proximity to a pile driver.243-257 dp. The public may not understand that a pile driver uses explosions.

Today I had personal, close proximity experience with 100 decibel from pneumatic Road Drilling. At times, it was unbearable. I am located 4 foot subterranean and one of my small ponds is set in the ground. I video documented the "noise" level as my startled fish stayed in hiding and would not feed. I documented the evening quite, with nature sounds as my fish did come out of hiding and feed.

4.11-2

The "noise" level of the seismic airgun array is charted between lightning strike and sea floor volcanic eruption. All are explosive, concussive sound.

4.11 – 3

By comparison; rail transit horn, jack hammer, compressor and nail hammer are the only items on this chart that create concussive sound. Sudden *displacement* is a factor in the seismic testing.

Table 4.11 -2 Regulatory Requirements Related to Noise Impacts

Federal: A reasonable man or woman would agree that the Seismic testing will "harass" or be a nuisance to marine mammals. (I personally find this to be an understatement.)

Local: - A reasonable man or woman would agree that the Seismic testing will violate restrictions and allowable noise levels. In Los Osos and

Baywood Park there is an additional burden to a demographic of disadvantaged; senior-disabled population. Pneumatic road drilling has begun in the "Prohibition Zone" as a precursor to the County Sewer Project. There is an unstated, but known additional burden to Los Osos in considering "environmental justice."

#### Level A and Level B Harassment

I agree with the term "torment" and potential to injure. I agree that the 250 dp is well above the 180 dp noted to cause physical injury to whales.

I agree that the 250 dp is well above the 190 dp noted to cause physical injury to dolphins, porpoises, sea lions and harbor seals.

I contend that 250 dp is *excessive* "harassment" and "torment."

#### Table 4.11 – 3

The only comparable outdoor activity on this chart at 70 db is outdoor sports and recreation. San Luis Obispo County allows off-road vehicles access at Oceana Dunes, a lower section of Pismo State Beach. The "noise" of multiple, off-road vehicles is an extremely loud and dangerous deterrent to wild life and beach goers. Death of children, riders, and even rescue workers comes yearly. This outdoor recreation is also very destructive to the environment and creates troublesome hazards from free floating silica, (pulverized sand) that drifts towards Nipomo Mesa. I agree that the 250 db is well above the most annoying and dangerous outdoor activities listed on Table 4.11 – 3.

#### Other tables and data;

Again, 250 Decibels is the most important fact in all the data, and yet it remains illusive in this EIR presentation on "Noise." By comparison; the number of decibel that could kill a human in the water is the second most important fact, and we cannot make this comparison. Project duration of 82 days is the third most important fact, which is more visible then the dp intensity.

#### Figure 4.11 – 5

The minimum decibel level of this chart is 120-129 db closest to shore, which is unacceptable. Maximum db closest to shore is 190-199, which is also unacceptable and conflicts with testimony already publicly released.

#### Figure 4.11 – 6

Noise Impacts shows db at 130 – 139 within the back bay of Morro Bay and Los Osos, Baywood, which is a protected estuary. 130 – 139 db is well above 100 db for a pneumatic road drill, which is unacceptable. The minimum 110-119 dp is above the 100 db of a pneumatic road drill, which is unacceptable for this wetland eco-system.

#### Impact No.1 Mitigation

I disagree that there is a less than significant exposure to harmful noise levels to persons present in the water, based on the decibel levels on the aforementioned charts.

“Studies have shown that high levels of underwater noise can cause dizziness, hearing damage and other *sensitive organ damage* to divers and swimmers.”

Sensitive organs would include the inner ear, a placenta, and blood filled uterus. As women may not know they are pregnant and there are a known percentage of miscarriages in the first trimester; did “mitigation” consider the difference between male and female persons in the water and consider the potential damage to a fetus?

What is known, but is not noted is that the Fall is our warmest season on the Central Coast. The “dead of winter” argument does not hold up, as life does not stop on the Central Coast during our Indian Summers, it thrives. October is so warm that I have to pass out parasols each year to the tourists who come to visit my garden studio. It is well documented women are wearing bikinis and everyone is swimming on New Years Day. New Years is exceptionally warm on the Central Coast.

The statement that swimmers and surfers would “not be fully submerged” is erroneous. A swimmer, surfer or Kayaker or parasailor could and would at any given time, be *fully submerged*. The only part of an individuals body

that would be out of water, once in the water, would be the head, but NOT the brain stem.

The mitigation is flawed because it assumes that life, as we know it on the Central Coast will come to a stand still. Many ocean recreators are from outside areas, and will NOT have the knowledge nor realization of the seismic impacts, in order to protect themselves. Persons from the inland valley know that when it is cold and foggy in Bakersfield and Fresno, it is warm at the beach. Again, 250 Decibels is the most important fact in all the data, and yet I have to research and search for this information to confirm the decibels. By comparison; the number of decibel that could kill a human in the water is the second most important fact, and I have yet to find it

I am giving you two examples why having spotters to mitigate the danger to the public is ludicrous. I passed all my swimming lessons in Taiwan when I was only six years old. I have swum and lap swam ever since.

#### Example

- 1) In 2000, I was jumping waves at Morro Bay beach with some tourists, right in front of a Lifeguard tower. I slipped over the back of a wave and went over my head. I immediately called for help, and my son ran along the shore as the current carried me parallel to shore towards Morro Rock. The current carried me at such speed, that my adult son could not catch up to me, while running. Knowing there is a current that drags swimmers towards the rock, the Lifeguard never saw me caught in the current. As I was losing the ability to swim and stay afloat, I called out to a surfer about to catch a wave. If he had caught the wave, I would have drowned. I would have drowned in front of my only child who could NOT catch up to me. The surfer backed off the wave and tried to take my arm onto his board, and I went under due to exhaustion. A second attempt, I was able to hang on as he ferried me the short distance over the breakers to the shore. The lifeguard never saw the surfer rescue me.
- 2) I was at Water World in Sacramento in the pool with the wave machine, right in front of the Lifeguard tower where I would be safe. I was not over my head, but the waves would be over my head. When the waves came in quick success, I went under and could not surface. The lifeguard could NOT see me right in front of him, because he was looking out at the other swimmers, over my head. My son, then a child, ran for help. I was strangling under the water. When the waves ceased I was no longer

over my head and two men pulled me in with a pole. The Lifeguard, within 12 feet of me was shocked, as he never saw me drowning.

*Observe and remove divers from waters* is impractical and not realistic.

Impact No. 2 – 19

The support vehicle along the Morro Bay sand spit will be unacceptable due to the protected Snowy Plover.

Groundborne Noise vibrations

Mitigating factors on “noise levels” and ground vibrations on Los Osos, Baywood Park is an unaddressed issue. Los Osos is built on a sand dune. There are numerous properties, (homes) which are subterranean to the property next to it. Sound waves travel through the earth. Silica, (sand) is a quartz structure, which conducts energy or the transference of shock waves. Los Osos has high ground water, with areas noted of underground lakes. Liquefaction is an issue in Los Osos, in case of an earthquake. The Seismic testing will take place as the Los Osos sewer is commencing. The de-watering plan calls for pumping out the ground water, and underground lakes for the trenching of 9 – 20 feet. I live over an underground lake and have made an offer to buy this property. There is an inadequate foundation, termites, and my home is subterranean by four feet to the property behind it. Any additional “noise” or sound waves coming through the earth at the time of the de-watering may cause the foundation to sink. The Seismic study places an additional burden on Los Osos, which has a fragile eco-system and a fragile, and diverse population with “disadvantaged” status.

Environmental Justice is an issue for Los Osos, which is NOT fully addressed.

Dr. C. Hite, Los Osos  
World Community Workshop  
P.O. Box 223, Morro Bay, CA 93443

**E-12-005**  
**PG&E SEISMIC SURVEY**

**E-MAILS TO CCC STAFF,  
CASSIDY STAFF**

2167 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012  
AND 18737 HAD SIGNED IT ONLINE

Date:

Thursday, November 01, 2012 4:18:34 PM

s karg gave the following reason for signing this petition:

"Stop this nonsens, and do the right sign"

18728 other people have also signed the following message:

Greetings,

I just signed the following petition addressed to: NOAA Fisheries, California Coastal Commission, California Department of Fish and Game, National Science Foundation, Lamont-Doherty Earth Observatory and U.S. Fish and Wildlife Service

-----  
Halt the Central Coastal California Seismic Imaging Project

The goal of the seismic imaging project is to attempt to measure the three major earthquake fault lines which run along our coast. The existence of these fault lines, especially after the continuing disaster at Fukushima, Japan, call into question the advisability of maintaining the Diablo Canyon nuclear power facility, operating near Avila.

The proposed testing will do nothing to prevent an earthquake on any of these fault lines. The tests will instead produce a large amount of data about dangers that we cannot avoid when these earthquakes occur.

Here is how the environmental impact report for the project describes it:

"The offshore component of the Project would consist of operating a geophysical survey 29 vessel, its associated survey equipment, and support/monitoring vessels . ... The survey would be conducted along the central coast from approximately Cambria to Guadalupe (including marine protected areas around Cambria and elsewhere). ... 18 active air guns ... would discharge once every 15 to 20 seconds."

In other words, huge underwater canons would blast ear-shattering sounds under the water in an area from Guadalupe to Marin County. (These same measures are used to search for offshore oil reserves — coincidence?)

The environmental impact report indicates these tests would kill or injure marine mammals, including seals, dolphins, whales and otters. They could make them go deaf which would mean a lingering death. Already depleted fishing resources would be impacted. Seabirds would be affected as well, with little or no way of mitigating the impacts. Migratory birds would be affected as the tests would go on 24 hours a day and lights at night would be required. Air quality would be impacted and the project would contribute to climate change.

The ocean is our most precious resource. If the life of the ocean does not matter then neither do our lives. Some few persons stand to make lots of money from this outrageous project. PG&E will pass on the costs to us, the consumers. We and all life

in the ocean and the land around us stand to lose. And for what?

The project will not prevent the next earthquake. And if it happens and Diablo crashes, so do we. Think of the economic impact of such a disaster. A recent issue of The Economist has on its front cover a statement that says the dream of nuclear power has become a nightmare. It is time to put our resources into safe energy and abandon nuclear power.

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Sincerely,

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/halt-the-central-coastal-california-seismic-imaging-project>. To respond, [click here](#)

2404 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012  
AND 5286 HAD SIGNED IT ONLINE

Date:

Thursday, November 01, 2012 8:52:17 AM

valentina echavarria zuluagga gave the following reason for signing this petition:

"tienen derecho a vivir

"

5826 other people have also signed the following message:

Greetings,

I just signed the following petition addressed to: California Coastal Commission and California State Lands Commission.

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Protect Whales ~ Stop Seismic Testing off the Coast of Central California!

To: Mary Shallenberger, Chair, California Coastal Commission and Jennifer Deleon,  
Project Manager, California State Lands Commission

Central Coastal California Seismic Imaging Project–Whales Need Your Help NOW!

Pacific Gas & Electric (PG&E) is posed to conduct seismic testing in a grid pattern over a large area off the Central Coast of California from Cambria to the Santa Maria River. Tests could begin as early as September 2012 and last until the end of the year. The research ship would emit blasts of very loud noise into the ocean. Streamers four or five miles long would be towed behind the vessel, which would pick up the sound waves as they penetrate several miles into the Earth's crust and reverberate back to the surface.

Tests would last for 24 hours and would kill or injure marine mammals, including whales, dolphins, porpoises, seals and otters. A deaf marine mammal is a dead one as this is the sense they rely on to communicate, navigate and find food. Seabirds and other species such as endangered sea turtles, could be affected as well, with little or no way of mitigating the impacts. Great potential harm is highly possible to the small population of harbor porpoises in the Morro Bay area. They are most sensitive to loud man-made sound and the mammal most vulnerable to habitat abandonment and to hearing loss.

PG&E's position is that the tests are necessary to map the ocean floor so geologists can better understand the earthquake faults near Diablo Canyon nuclear power plant, close to San Luis Obispo, California. Earthquake faults were known at the time the plant was built. PG&E states these tests are essential in the aftermath of the Fukushima earthquake and subsequent tsunami, and the potential for a nuclear disaster.

If an earthquake happened within the near future, what could be done to ensure that the Diablo Canyon plant would not have a meltdown? How will these tests prevent that scenario? The nuclear plant was constructed knowing that faults were nearby and that earthquakes were a potential danger. Wouldn't it make more sense to spend the millions of dollars the tests will cost to instead begin plans to shut down the plant and find ways to shift to safe energy? Wouldn't this be wiser than

destroying untold numbers of animals within a Marine Protected Area, particularly when the necessary safeguards have not been implemented?

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Sincerely,

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-protect-whales-stop-seismic-testing-off-the-coast-of-central-california>. To respond, [click here](#)

**2367 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012**

**Subject:** Reject PG&E's Proposal for Seismic Testing in Central Coast  
**Date:** Thursday, November 01, 2012 3:28:53 PM

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Dear Commissioners

Dear California Coastal Commissioners:

I'm writing to express my opposition to PG&E's Proposal for Seismic Testing in Central Coast.

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I'm deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

I'm also concerned that PG&E is disregarding the health and safety of ocean users. Their EIR clearly says the proposed activities would expose persons present in the water to harmful noise levels. And a recent PG&E map shows that dB levels could reach upward of 160 at some beaches. This is well over the threshold for human safety.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

Please deny this project. The Coastal Act was created to protect ocean resources and recreation. We believe this project does not conform to following sections of the Coastal Act:

**\*\*Section 30220--Protection of certain water-oriented activities--** Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

**\*\*Section 30224--Recreational boating use--**Increased recreational boating use of coastal waters shall be encouraged...

**\*\*Section 30230-- Marine resources; maintenance**

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

**\*\*Section 30210-- Access; recreational opportunities; posting**

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...

We urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Karyn Boatman  
3025 Hollycrest Dr., #3  
Los Angeles, CA 90068

**1884 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012**

**Subject:** Protect Central Coast Wildlife and fisheries  
**Date:** Wednesday, October 31, 2012 4:45:00 PM

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Oct 31, 2012

California Coastal Commission

Dear Commission,

At October's meeting, you will be asked to make an important decision about the PG&E Central Coastal California Seismic Imaging Project which, if approved as is, could wreak havoc on the stunning marine wildlife of the central coast. The Coastal Act requires the protection of marine and biological resources as well as prevention of impacts to environmentally sensitive habitat areas (ESHA).

In keeping with the mandate of the California Coastal Act, I urge you to:

- Deny the project at this time, and work with the applicant to fully examine alternatives with the potential to greatly reduce impacts on the marine environment. This project should not move forward until alternative methods such as low-impact studies, better modeling, and technology currently in development have been fully examined as alternatives which may provide essential information on slip rates and earthquake risks that the proposed studies may not provide.

Alternatively, if the project does move forward, I urge you to take all necessary and available steps to:

- Avoid impacts where possible: Dr. Douglas Hamilton, a former PG&E geologist, testified before the California Public Utilities Commission that much of the offshore testing simply duplicates previous work. Please fully examine the need to test in areas identified by Dr. Hamilton and delete those that are redundant and unnecessary.

- Reduce impacts where possible: In those areas where offshore testing will take place, the Commission must make every effort to reduce its impacts on marine life, especially threatened and endangered marine mammals. We ask the Commission to deny the extension of the survey to the end of December, when gray whales are migrating through the central coast. We also hope you will fully consider alternative configurations and technologies that could reduce impact to coastal resources.

- Fully account and mitigate for damage to marine resources: The Environmental Impact Report understates the impacts to fisheries and invertebrates. We urge the Commission not to repeat the unfounded assumptions of the EIR and mandate rigorous long-term monitoring and mitigation measures for fish, invertebrates and habitat protection as a condition of any offshore seismic testing.

While I believe that we need to know the real seismic risk of to the Diablo Canyon Power Plant, I think PG&E needs to do this project right the first time.

Thank you for considering my comments.

Sincerely,

Christine Bernardo  
1999 8th St  
Los Osos, CA 93402-2765

1266 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012

Date: Thursday, November 01, 2012 5:06:13 PM

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Nov 1, 2012

Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Dear Teufel,

I'm writing to express my opposition to PG&E's proposal for seismic testing off California's central coast.

This project could have dangerous and deadly impacts on marine life and the ocean ecosystems they depend on for survival.

PG&E's own EIR clearly states unavoidable impacts to marine life. The California coast is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

I urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Lisa Feldman

43123

## **Teufel, Cassidy@Coastal**

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**From:** Anne Leone <anneleone36@gmail.com>  
**Sent:** Monday, October 29, 2012 4:39 PM  
**To:** CoastalPGESeismic  
**Subject:** Stop Seismic Testing

Honorable Commissioners,

I am writing to you today to express my strong opposition to PG&E's proposed seismic testing in the waters off of the Diablo Canyon nuclear power plant. And when I say 'strong opposition,' let me be clear – the proposed project would be an abomination. Nothing less.

I understand that we are living in a post-Fukushima world. I recognize that there is more to learn concerning the fault lines near the Diablo plant. I am aware that state law mandates that PG&E do extensive seismic studies. I know all of this. And yet, I still oppose the project. Why?

While there are a number of reasons, let me start with the 'worst case scenario.' I am sure you are familiar with this argument, but nonetheless, it seems like a good place to start.

The Environmental Impact Report on the project quantified its potential 'take.' 'Take' means, as I understand it, 'losses' ... whatever the testing could potentially 'harass, harm, or kill.' Those are the words used to qualify 'take' – harass, harm, or kill. 'Kill' is easy enough to understand. Anything close enough to the blasts will be killed on the spot, leaving carcasses in our water and on our beaches. 'Harm' doesn't sound quite as serious, until you get into the details. David Gurney, Vice Chair of the Ocean Protection Coalition of Mendocino County, has attempted to elucidate the risks. "Each of these underwater blasts will be at the volume level of a shock wave, that will instantly deafen, maim, and possibly kill everything unfortunate enough to be in its path ... For a human, your ears, or what's left of your ears, would probably never stop ringing. The consequences of experiencing this level of sound can only be presumed to be immediate and permanent deafness – if not worse. For sea life, beyond just broken eardrums, the transfer of low-frequency shock waves from water-air-water causes hemorrhaging of lungs and air-sacks." A representative of Greenpeace has stated, "Dolphins' eyes will burst and bleed. Whales will become confused as their eardrums rupture from the pressure. The lucky ones ... are the smaller marine life forms that will simply be killed immediately." Those creatures unable to see, hear, float... for them, these tests would mean painful, lingering deaths. That is what 'harm' means. Even 'harass,' the most innocent sounding of the three, becomes horrific when you get into the details. Terrified, animals could split from their pods. Babies could be separated from their mothers. Both of these situations would likely prove to be death sentences for the creatures involved.

So what stands to be harassed, harmed, and/or killed? The Environmental Impact Report puts the potential toll at 15 Blue Whales, 13 Humpback Whales, 25 Fin Whales, 1 Minke Whale, 2 Sperm Whales, 97 California Gray

Whales, 1 Short-Finned Pilot Whale, 3 Baird's Beak Whales, 7 Killer Whales, 8 Striped Dolphins, 8 Small Beaked Whales, 81 Dall's Porpoise, 82 Long-Beaked Dolphins, 98 Risso's Dolphins, 114 Northern Right Whale Dolphins, 198 Pacific White-Sided Dolphins, 1,062 Bottlenose Dolphins, 1,834 Short-Beaked Dolphins, 76 Harbor Seals, 1,062 California Sea Lions, and 1,485 Southern Sea Otters, along with innumerable sea turtles, fish, and birds, and the entire next generation of sea life, including nearly 4 million larvae. Thousands upon thousands of animals tortured to death.

PG&E has pointed out that in other areas where similar tests have been done, monitors did not 'observe harm' to whales. But mortally wounded whales sink into the ocean, making 'observing harm' very difficult indeed. PG&E has also said that it will do what it can to mitigate harmful side effects. But no matter how hard they try, in projects of this magnitude, human error is a certainty. There will be side effects. There will be harm. You cannot cruise through marine preserves, blasting twenty 250-decibel 'air cannons' more or less continuously for 42 days and expect that it won't affect something. Nothing exists in isolation. Seismic blasts least of all.

But let's assume for the moment that PG&E can do some of what it is promising, and that it manages to avoid the 'worst case scenario.' Perhaps the tests will only cause 50% of the previously mentioned destruction. Perhaps only 25%. What then?

The Northern Chumash Tribal Council, in a statement opposing the project, referenced its "destruction of the warp and weave of the basket of life." But what does that actually mean? "The warp and weave of the basket of life?" Essentially, it means that our planet's natural systems are delicate, interdependent and unbelievably complex – developed over millennia – and that when we mess with them, we are tinkering in things we do not fully understand. Moreover, and most importantly, our lack of understanding makes it hard to accurately predict the full ramifications of our actions.

This idea is conveyed particularly clearly in David Suzuki's *The Legacy* – a book that could easily be viewed as the *Common Sense* of the environmental movement – and is given especially elegant expression in Suzuki's discussion of salmon.

That salmon are dependent upon the temperate rainforest in whose rivers they are born is common knowledge. They need the shade from the trees to keep the rivers cool, and the roots of the trees to hold the banks in place. They need these things as juveniles, and they need them again when they return as adults, after a life spent at sea, to breed. What is less widely understood is that the forest needs the salmon just as much as the salmon need the forest. Suzuki explains why this is the case. He points out the vitally important fact that the salmon accumulate nitrogen in their bodies while they are at sea, and that they bring this nitrogen back with them when they return to breed. The nitrogen is then passed along to the predators that catch the fish – the bears, wolves, and eagles of the area – who go on their merry way after eating the salmon, excreting nitrogen-rich fertilizer all over the forest. The salmon are thus the source of the forest's nitrogen, and bears are the 'vectors' that carry it. But the system gets even more complex. The bears, as it turns out, eat only the best part of the fish and leave the rest behind on the forest floor. Many creatures then consume the leftovers, including,

significantly, flies. The flies lay their eggs in the carcasses, and the larvae, once they hatch, feed on them. Nitrogen from the ocean is thus passed on to the larvae, which pupate over the winter. Come spring, trillions of nitrogen-rich flies are born – just in time for the annual migration of South American birds to pass through on their way to their nesting grounds in the Arctic. So, the nitrogen is passed from the salmon to the bears, from the bears to the forest, from the bears' leftovers to the flies, and from the flies to the birds. And the birds carry it on with them, depositing their own droppings and feeding their own set of predators as they continue to travel north. This beautiful, delicate system thus not only links our land with our oceans, it also connects South America to the northern hemisphere – and all of this, from salmon.

I offer this anecdote to help illustrate the complexity of the systems we are messing with. We as humans, we tend to take these interconnected systems, divvy them up, and place the resulting 'pieces' under the control of different bureaucracies. (For example, in the system mentioned above... the salmon would perhaps fall under the purview of the Canadian Minister of Fisheries and Oceans, the trees, the Minister of Forestry, the bears, the Minister of the Environment. The rivers would maybe be managed by the Department of Agriculture, and the rocks and mountains by the Ministry of Energy and Mines.) But that is not how nature works. One thing impacts the next, and should a single card fall, the whole house is at risk. THAT is the meaning of "the warp and weave of the basket of life." That is what is at stake. Because make no mistake, the animals that the PG&E tests will endanger are players in complex systems of their own. So, even if PG&E manages to kill slightly fewer animals than the utterly horrifying number put forth by the Environmental Impact Report, the impact could still be massive. The ultimate point being, we do not know – we cannot know – the full extent of the mess we would be making should PG&E's tests go forward.

So, with all of that in mind – all of the massive loss that could be incurred as a result of the project – the next question is, what would be the gain? Presumably, to offset the loss, the gain should be equally massive. But that does not seem to be the case. The Nuclear Regulatory Commission has already concluded that the Shoreline Fault poses no threat to Diablo, and the Natural Resources Defense Council has concluded that seismic testing would "provide only marginal additional informational information that will not affect the safety of the Diablo plant." So, for all that devastation, we would be gaining only 'marginal' information? Moreover, the value of any information is dependent upon how one uses it. In all seriousness, if the project goes forward, what would we do with the resulting data? Is PG&E going to shut down the plant, should the fault lines prove more dangerous than expected? Probably not. Would they increase safety precautions? Maybe. But shouldn't a nuclear power plant sitting on multiple fault lines have top of the line safety measures anyway? We already know that scientists' best guesses can be proved wrong – Fukushima was hit by a 9.0 magnitude quake when the scientists did not believe that the fault line would produce anything stronger than 8.0. Should the PG&E tests go ahead, and prove the faults less threatening than currently presumed, would it really be wise to sit back, relax, and accept less than ideal safety precautions? When it comes to nuclear power, shouldn't we be prepared for the worst anyway? Let's take the \$64 million dollars that would be spent on the seismic tests, and put it towards plant upgrades instead.

In the end, we are talking about massive loss for minimal gain. We are talking about risking the lives of thousands of animals. We are talking about torture. We are talking about endangering the ecosystems upon which we, and so many others depend. We are talking about a lot of things, and it is my hope that the California Coastal Commission is willing to listen.

Concern is not limited to Californians. I am from a town in New Jersey called Haddonfield, located just a few miles from Philadelphia. I studied at Northwestern University in Chicago. And today I write to you from Ohio. Everyone I speak to, everyone who has heard of this project, finds it repugnant. Concern over this is nation wide.

These tests do not have to go forward. They are not, as Amanda Wallner of Sierra Club California said, “the best way or the only way to determine seismic risks.” We can, and must, do better – by ourselves, and by the earth that harbors us.

Sincerely,

Anne Leone

Medina, OH

## **Teufel, Cassidy@Coastal**

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**From:** Swanson Jane <janeslo@kcbx.net>  
**Sent:** Thursday, September 27, 2012 2:48 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Central Coastal SeismicImagingProject

September 27, 2012

Cassidy        Teufel, Coastal        Analyst  
California     Coastal Commission  
45    Fremont        St  
Suite 2000  
San    Francisco, CA 94105

[cassidy.teufel@coastal.ca.gov](mailto:cassidy.teufel@coastal.ca.gov)

Re:    Central Coastal Seismic Imaging Project

San Luis Obispo Mothers for Peace supports gathering seismic information about the earthquake faults near Diablo Canyon Nuclear Power Plant. In the wake of the Fukushima disaster and PG&E's application to renew the licenses, seismic studies must be done to learn more about the potential dangers posed by earthquake faults to the two nuclear reactors and the tremendous amount of high-level radioactive waste that has accumulated on site over the past 28 years.

The current proposed plans for seismic studies offshore and near Diablo Canyon Nuclear Power Plant were set in motion by AB 1632, an act of the California State Legislature. AB1632 is being implemented by the California Public Utilities Commission. At present, Pacific Gas & Electric Company (PG&E) plans to conduct these studies from November - December 2012, with the possibility of the tests being divided into two parts in successive years at the recommendation of the California State Lands Commission. Mothers for Peace asserts that there are additional faults that also need further study in order to determine whether they might lead to more severe consequences than either the Hosgri or Shoreline Fault. These faults include the Diablo Cove Fault, which runs directly under the Unit 1 reactor, the San Luis Bay Fault, and the Los Osos Fault.

San Luis Obispo Mothers for Peace shares the concerns of many local citizens and organizations about the extensive harm that will be inflicted on marine life if these studies are carried out as currently designed. PG&E's plans rely largely on extremely loud underwater air guns, which are acknowledged by all parties to be highly disruptive to the ocean environment. Mothers for Peace urges extreme caution in the method used to obtain data about the faults in the 530 square nautical miles of the proposed testing area.

Because of grave and valid concerns voiced by the fishing and environmental communities, Mothers for Peace advocates that the seismic testing be delayed to allow time to thoroughly explore other technologies less harmful to marine life, and baseline studies of marine life must be completed and analyzed before any testing begins.

Because there is no plan for storing the radioactive wastes for the 250,000 years they will remain lethal; because Homeland Security classifies all nuclear facilities as targets of terrorism; and because of the 13 earthquake

faults in the area around Diablo Canyon, San Luis Obispo Mothers for Peace for decades has recommended that the plant be shut down and all stored radioactive waste transferred to hardened casks as soon as possible.

Jane Swanson, Spokesperson

San Luis Obispo Mothers for Peace

[Mothersforpeace.org](http://Mothersforpeace.org)

P.O. Box 3608

San Luis Obispo, CA 93403

[janeslo@me.com](mailto:janeslo@me.com)

(805) 595-2605

Jane Swanson  
[janeslo@me.com](mailto:janeslo@me.com)  
[janeslo@kcbx.net](mailto:janeslo@kcbx.net)  
(805) 595-2605

## **Teufel, Cassidy@Coastal**

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**From:** Lester, Charles@Coastal  
**Sent:** Thursday, September 27, 2012 11:38 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: no to PG&E

### **Charles Lester**

Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

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**From:** [karinuphoff@gmail.com](mailto:karinuphoff@gmail.com) [<mailto:karinuphoff@gmail.com>] **On Behalf Of** Karin Uphoff  
**Sent:** Thursday, September 27, 2012 11:29 AM  
**To:** Lester, Charles@Coastal  
**Subject:** no to PG&E

Dear Charles Lester,

It is up to people in positions such as yourself, to stop what most Californians consider illegitimate use and abuse of OUR shared Marine habitat. The required environmental impact statement is based on a study that cannot be ignored. The seismic testing proposed by PG&E would permanently cause damage to the species listed below and has potential to adversely effect our marine habitat and destroy resources that other businesses in California depend upon (fishing, tourism etc).

*I urge you to take the responsibility you are in office to do and oppose this action by PG&E*

“Takes of Marine Mammals Incidental to Specified Activities: Marine Geophysical Survey off the Central Coast of California, November to December, 2012,” is a National Marine Fisheries Service (NMFS) document that reviews the survey specifics as related to local marine mammals and marine life.

The 116-page report s: “To avoid the potential for injury, NMFS (1995, 2000) concluded that cetaceans and pinnipeds should not be exposed to pulsed underwater noise at received levels exceeding 180 and 190 dB re 1  $\mu$ Pa (rms), document “Takes of Marine Mammals

Here’s the list as noted on the *Daily Kos*:

One Minke Whale,  
2 Sperm Whales,  
5 Dwarf Sperm Whales,  
15 Blue Whales and  
97 California Gray Whales,  
25 Fin Whales,  
13 Humpback Whales,  
a single Short-Finned Pilot Whale,  
3 Baird’s Beak,  
7 Killer Whales,  
8 Striped Dolphins,  
8 Small Beaked Whales,  
81 Dall’s Porpoise,  
82 Long-Beaked Dolphins,  
98 Risso’s Dolphins,

114 Northern Right Whale Dolphins,  
198 Pacific White-Sided Dolphins,  
1,652 Bottlenose Dolphins,  
1,834 Short-Beaked Dolphin  
76 Harbor Seals,  
Countless numbers of turtles.

Sincerely,  
Karin Uphoff, registered voter in California

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Karin C. Uphoff  
author of Botanical Body Care  
[www.rainbowconnection.net](http://www.rainbowconnection.net)

## **Teufel, Cassidy@Coastal**

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**From:** roger andriola <roger\_andriola1@mail.com>  
**Sent:** Tuesday, September 25, 2012 3:54 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** PG&E'S PENDING SEISMIC TESTING PERMIT

TO THE CALIFORNIA STATE COASTAL COMMISSION FOR CONSIDERATION ON THE PENDING PG&E SEISMIC TESTING PERMIT

### PG&E'S PENDING ASSAULT ON THE SEA AND GRAY WHALES

Some say, short of thermonuclear war, PG&E's Diablo Canyon nuclear power plant, with its radioactive, spent fuel posing a toxic hazard lasting longer than the quarter million years we Homo sapiens have populated this planet, presents the biggest threat to our land and sea, one that, with either PG&E or one of its corporate successors at the helm, aided and abetted by its state regulatory sponsors, will eventually render our California scenic central coast, like Fukushima, Japan, permanently uninhabitable, and that we ought to wake up to reality, and not grant it any more permits.

During the last decade, while he held the reins, this government protected, PG&E monopoly, was good to its CEO, first mate Peter Darbee, with its money. It put him into the top 1%, of the top 1%, of american income, America's daca-millionaires club, those who pull in, whether they earn it or not, more than \$10m per year. Then as this 'stick-up team' pulled away from the bank, they took a parting shot. As a gift for his many 'missteps', when he stepped down, PG&E let him walk away with a \$35m retirement package, to help him maintain the lavish lifestyle to which he became accustomed while 'running' this utility. And a good run it must have been for you, Peter. Too bad we poor captive rate payers were left holding the bag.

Its new head honcho (whose total title would take too much time to type), Anthony F. Earley, Jr, to whom Peter Darbee turned over the reins, now eager, naturally, to position this Fortune 200, energy-based, holding company, corporate parent to Pacific Gas and Electric, California's largest investor-owned utility, for ever more government protected-monopoly profit, (both Boards are the same, except for the 13th member added to the Utility, its 'junior' president, Chris Johns, and include Fred J. Fowler, Chair of the Board for Spectra Energy Partners, LP, and Roger H. Kimmel, Vice-chair of Rothchild Inc.), and Alan Gordon, the State Lands Commission's August 20, public hearing, acting chair, which granted PG&E'S seismic testing permit, need to come clean on their 'sans souci,' 'hey, no troubles, mate' attitude.

Some now say the "fix was in" between Alan Gordon, pretending to consider input from a 'public meeting hearing', and Ken Wiseman, Executive Director of the phony, 'named for public consumption only', newly evolving, Marine Lflfe Protection Act (MLPA).

Whatever their relationships, these three questionable characters need to address some of the underlying contentions, like the one that Diablo Canyon nuclear waste storage poses no public concern problem. A good start for these three would be to step up to the plate, set an example, and show the public that they are well meaning, legitimate public servants, by burying Diablo Canyon's spent fuel in their back yards. We would sure rest a lot easier if they would just take that first, simple step, to reassure us. (News Alert! Russia has been secretly dumping its nuclear wastes into the arctic seas where the Gray whales feed, while the Japan plan is to dispose of its Fukushima Daiichi nuclear mess into the forest to poison, into perpetuity, their unsuspecting forestry friends).

PG&E's Tony Earley, State Lands' Alan Gordon, and MLPA Executive Director Ken Wiseman, do not own the Pacific Ocean's marine mammal, wild sea life, nor is it theirs to destroy.

The Mysticeti Gray whales, magnificent sea creatures in their own right, a gift to all humanity from Father God and Mother Nature, growing up to 50' in length and weighing more than 50K pounds, thriving through more than 30M years of evolution, are now being driven to extinction in a few short centuries.

With the north Atlantic population ruthlessly, and mindlessly, human hunted to extinction in the 18th century, (can you imagine the careful community consideration that must have gone into making sure you work your way down to and then kill the last surviving mating pairs and pregnant cows of this vital resource), by the 'captains of commerce' of their day, working with their government regulatory sponsors, and the north Pacific, western population now near extinction, all that we have left of this 30m year old, magnificent leviathan of the sea, is the North Pacific eastern population, our California gray whales, with its own population plunge from more than 100K a few short centuries ago, to less than half that now.

In 1936, the Gray whale became a protected, endangered species in U.S. waters.

As PG&E and our three questionable characters no doubt know, the well established, primary extinction threats to this, the only remaining Gray whale population, survival hope, are the 'oil and gas exploration geophysical seismic surveys' of the type PG&E proposes for this November, (as one of our SLO CO's Supervisors seems to understand), 'near shore industrialization and shipping congestion' throughout their migratory corridors, human commercial (not subsistence) predation, ocean pollution, and again, the "acute noise" from PG&E'S proposed, underwater, seismic testing, now little more than one month away.

When, on their spring season, more than 5k mile, longest mammal migration on the planet, northward along the continent to their summer season, amphipod-filter-feeding, Bering and Chukchi seas destination, this last remaining Gray Whale population, (and not this wild mammal species alone), belongs to all the peoples on the eastern pacific shores.

On their autumn season, more than 5k mile long, southward, return migration, (now no longer able to birth in the polluted, congested, industrialized waters off southern california, they must travel still further south), all the way to the Baja California calving lagoons, and beyond, for their January through February, (note the similarities to their cousins, our own, central coast, Northern Elephant Seals), warm, winter season, southern birthing and breeding seas, now limited mostly to Laguna Ojo de Liebre, they belong, again, to all the peoples of the eastern pacific shores, not just to PG&E'S Tony Earley, State Lands' Alan Gordon, and MLPA'S Ken Weisman.

So Tony, Alan, and Ken's second step should be to assure us of the solvency, and PG&E'S willingness to shore up, its 'marine mammal and sea-food-fishing-loss,' trust fund, as necessary, to certainly more than \$1T to cover the costs of all their marine mammal 'losses,' to all the affected peoples of our planet, plus whatever additional compensation would be appropriate for further diminishing for everyone, our quality of life, by hastening this rush to extinction.

Perhaps Earley, Gordon, and Weisman could cough up a contrition contribution to the trust fund to salve their consciences.

roger ANDRIOLA, cambria

----- Original Message -----

From: Teufel, Cassidy@Coastal

Sent: 09/25/12 03:40 PM

To: 'roger\_andriola1@mail.com'

Subject: FW: test

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Tuesday, September 25, 2012 3:39 PM  
**To:** 'roger\_andriola@mail.com'  
**Subject:** test

**Cassidy Teufel**

**California Coastal Commission**

Energy, Ocean Resources and

Federal Consistency Division

*45 Fremont St., Suite 2000*

San Francisco, Ca 94105

T: (415) 904-5502

F: (415) 904-5400

## **Teufel, Cassidy@Coastal**

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**From:** Michele Stoutenborough <autumnleavesslo@yahoo.com>  
**Sent:** Tuesday, September 25, 2012 12:51 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** I Oppose Seismic Testing in San Luis Obispo County!s

To: Coastal Commission of California

From: Michele Stoutenborough  
1241 Pismo Street  
San Luis Obispo, CA 93401  
805-544-6494  
Email: [autumnleavesslo@yahoo.com](mailto:autumnleavesslo@yahoo.com)

I was given your email address after I called a few phone numbers I found on the California Coastal Commission's Website, which did not give me a way to email directly. I hope I have reached the right email address!

I am writing to vehemently oppose PG&E's current plan to conduct deep water seismic testing off our pristine coast in San Luis Obispo County. The destructive ramifications to our abundant sea life and unsuspecting sea mammals of these highly powerful tests; utilizing high density, high powered and extremely high-decible underwater blasts has not appropriately been determined. No one can predict the outcome and potential damage to our pristine ocean environment, which is a huge reason why many of us choose to live here, and to take vacations and visit here in beautiful San Luis Obispo County.

It could result in wide spread and wholesale destruction of ocean life, affecting sea life populations for many years to come!

If we allow the massive killing of sea life and ruin the re-emerging fisheries with these pointless tests, we are not thinking clearly! No matter how powerful PG&E is, they should NOT be allowed to dictate damaging testing in our county in order to further their profit goals at the expense of sea creatures who can't prevent it and don't know it's coming.

We also do not have a "clue" how this potential total destruction of sea life will affect the economic vitality of our thousands of local businesses that are totally dependent upon a healthy sea life and fish population - tourism, seafood restaurants, hotels and motels, fishing vessels and the fishing industry, deep sea tourist boats, whale watching expeditions, State Parks, beaches and natural preserves, etc. etc. - what if we take a hike along the beautiful coast and have no hope of seeing the surprise of a sea otter, playing in the waves; no more hope of viewing the majestic whale or dolphin? Can we imagine such a desolate future? It is totally insane to even consider such a holocaust - tantamount to a genocidal slaughter!

The Diablo Canyon Nuclear facility is getting OLD, the storage of nuclear waste on-site is still a threat, but to continue to operate such an antiquated plant is courting disaster! Why conduct seismic underwater studies to tell us what we already know? And kill hundreds if not thousands of innocent creatures in order to continue to "prop up" an already dangerous technology? Not to mention the huge cost of such a project - which will be passed on to us ratepayers, for many years to come! I refuse to pay to sponsor wholesale killing and destruction of sea life - whales, porpoises, seals,

dolphins, sea otters, elephant seals, all types of fish, and their spawning areas; and many more species that may be "wiped out" by such testing is unconscionable, horrific and totally unnecessary. Why aren't we totally protecting these marvelous beings, who obviously are smarter than we humans? This is analogous to wholesale destruction of a precious environmental resource! We cannot allow this to happen!

I remember fondly attending Anti-Diablo rallies in the 1970's, at which Governor Brown was present and spoke eloquently, to the many thousands who attended. We protested then; many thousands of people protested, but to no avail as the plant was constructed and has been in operation and in our midst now for over 30 years. That should never have happened! But to relent now, after over 30 years of operation, to allow PG&E to continue to operate a highly toxic, dangerous and OLD plant is tantamount to insanity. Enough is enough! I, and many of my friends and neighbors, are totally aghast at such a proposal!

Please, please use your influence and power to put a stop to this madness and insanity, NOW! Thank you for your attention and I appeal to you to do the right thing; in opposing and preventing a monumental disaster, the proportions of which we now cannot even fathom. I have faith that you will do the "right thing" NOW!

Sincerely,  
Michele Stoutenborough

**Teufel, Cassidy@Coastal**

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**From:** Carol Georgi <cgeorgi@hotmail.com>  
**Sent:** Friday, September 21, 2012 3:44 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Seismic Tests not mandated, only recommended

Dear Coastal Commissioner,

Please do not issue a permit to PG&E for seismic testing.

AB1632 does not mandate 3D seismic tests off California's coast.

AB1632 directs the CA Energy Commission (CEC) to assess seismic risk.

The CEC recommended the 3D seismic tests for both nuclear plants.

No thought was given to marine life destruction, end to local fishing, or economic impacts to local communities.

In 2008, the California Energy Commission issued recommendations for further intensive geophysical surveys in their AB 1632 report.

<http://www.energy.ca.gov/2008publications/CEC-100-2008-009/CEC-100-2008-009-CMF.PDF>

## **ABSTRACT**

The report *An Assessment of California's Nuclear Power Plants: AB 1632 Committee Report* was prepared in response to Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006). **The bill directs the California Energy Commission to assess the potential vulnerability of California's largest baseload power plants, Diablo Canyon Power Plant and San Onofre Nuclear Generating Station, to a major disruption due to a seismic event or plant aging;** to assess the impacts of such a disruption on system reliability, public safety, and the economy; to assess the costs and impacts from nuclear waste accumulating at these plants; and to evaluate other major issues related to the future role of these plants in the state's energy portfolio. The AB 1632 assessment will be included in the California Energy Commission's *2008 Integrated Energy Policy Report Update*, which is scheduled for adoption in November 2008.

The report provides findings and policy recommendations resulting from the AB 1632 assessment. It considers the seismic vulnerabilities of the nuclear plant sites, structures, and spent fuel storage facilities and the vulnerability of the plants to age-related degradation. The report also considers the impacts of a major disruption at these plants on the reliability of California's transmission grid and power supply. Finally, the report considers a number of policy areas related to California's operating nuclear power plants, including the cost, land use, and local economic impacts of nuclear waste accumulation at

the plant sites; the economic and environmental tradeoffs among alternative power supply options; and potential implications of renewing the operating licenses of these plants.

- **The California Energy Commission recommends that PG&E** should use three-dimensional geophysical seismic reflection mapping and other advanced techniques to explore fault zones near Diablo Canyon;

<http://www.energy.ca.gov/2008publications/CEC-100-2008-009/CEC-100-2008-009-CMF.PDF>  
assembly bill 1632 (Blakeslee, Statutes of 2006, Chapter 722), directs the Energy Commission to assess the vulnerability of the state's operating nuclear power plants to a major disruption due to a major seismic event or plant aging, the potential impacts of such a disruption, potential impacts from the accumulation of nuclear waste at the state's existing nuclear plants, and other key policy and planning issues regarding the future role of California's existing nuclear plants.

California's two operating nuclear power plants are Diablo Canyon in San Luis Obispo and the San Onofre Nuclear Generating Station (SONGS) in Orange County. Nuclear power makes up 12.9 percent of California's electricity supply. These two plants are located in seismically active zones along California's central and southern coast. In addition, they generate spent nuclear fuel, which will be stored at the plants indefinitely until the federal government develops a permanent means for nuclear waste disposal.

The bill requires the Energy Commission to adopt the assessment by November 1, 2008, and include the assessment in the 2008 energy policy review.

Sincerely,  
Carol Georgi  
243 Vista Del Mar  
Pismo Beach, CA 93449

## **Teufel, Cassidy@Coastal**

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**From:** Jules London <julesoflondon@yahoo.com>  
**Sent:** Sunday, October 28, 2012 11:12 AM  
**To:** CoastalPGSEismic  
**Subject:** Seismic testing.....

Last night Canada had a 7.7 magnitude earthquake followed by a tsunami watch advisory for Hawaii. Fukushima was a 9.0 followed by a tsunami of great force that took the lives of 10's of thousands. All the SEISMIC testing in the world cannot keep Diablo Canyon Nuclear Power Plant "safe." It is NOT safe. Any one who thinks it is safe, is living under a false pretense. Even if the seismic testing was done, what would it gain? Would it make Diablo withstand an earthquake larger than it was built for? No. It would not. If an earthquake larger than a 7.5 hits near the power plant and is followed by a tsunami, many lives are at stake. It is ludicrous that PG&E is requesting a "permit" to do seismic testing for a "better understanding" of what lies beneath and for the tune of \$64 million dollars!!!! The big joke here is that they, PG&E, are NOT forking out this bill. NO. They have the audacity to charge us, their paying customers for the \$64 million by rate increases!!! Unbelievable! Absolutely I am opposed to the seismic testing. It is not only a waste of PG&E's customer dollars but a HUGE waste of thousands of marine mammals precious lives for what? "Keeping US safe" ??? Really? Does anyone honestly believe this will make us better informed by knowing what lies beneath the Power Plant. I can tell you for free what lies beneath the PP!!! You know what lies beneath? Fault lines!!! See now you know what is down there and I didn't even charge you a dime for the information, nor did I cause thousands of sea mammals to wash ashore on your beaches, let alone bill someone ELSE \$64 million dollars to give you the information. See, no need for seismic testing!.....

Jules London  
SLO County Resident

Sent from my iPad

## **Teufel, Cassidy@Coastal**

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**From:** Michael J Phillips <phillips.michael07@gmail.com>  
**Sent:** Wednesday, October 31, 2012 11:44 PM  
**To:** CoastalPGESEismic; Joey Racano; Diane Smith; Maryann Avila  
**Subject:** Seismic testing  
**Attachments:** photo.JPG; ATT00001.txt

Dear commissioners;  
The world is watching ... Please do the right thing and STOP SEISMIC TESTING We must show compassion to the animals of the oceans

Thank you and Bless you  
Brother Michael J Phillips OCS  
Pueblo Colorado  
Phone 918-766-4091

**Teufel, Cassidy@Coastal**

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**From:** joannepiurk@aol.com  
**Sent:** Wednesday, October 24, 2012 7:14 PM  
**To:** CoastalPGESeismic  
**Subject:** STOP SEISMIC TESTING

To Whom It May Concern,

Stop seismic testing in our oceans. I wish to preserve the abundant marine life and habitat, and do not want the marine life harassed with the seismic testing. I do not approve of any testing that may potentially cause death or damage to our marine life. The stewardship of our oceans belongs to all of us, including our future generations. I wish to honor ALL life on the planet.

Sincerely,  
Joanne Piurkowsky  
Simi Valley, Ca.

## Teufel, Cassidy@Coastal

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**From:** cowboy-pirate <sticktitefarm@yahoo.com>  
**Sent:** Wednesday, October 24, 2012 2:00 PM  
**To:** CoastalPGESeismic  
**Subject:** testing

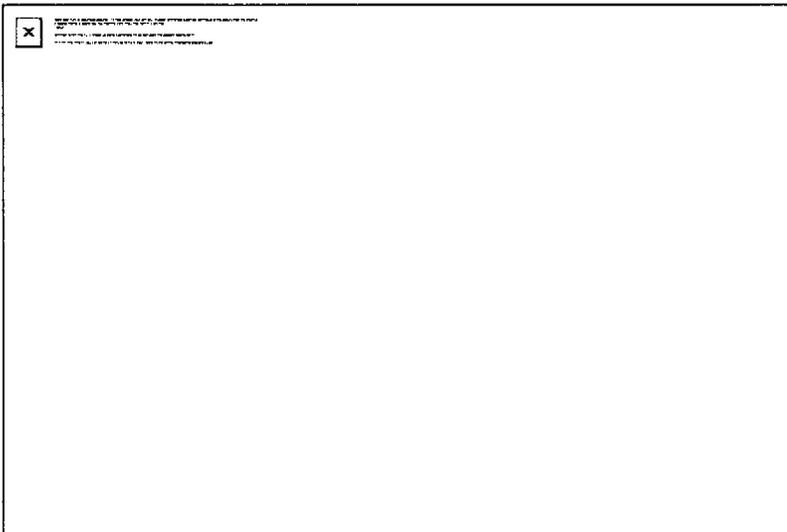
Please do not do the testing-

**"Make No Bones About It."**

**If Seismic testing is approved, ALL MARINE LIFE WILL DIE with in a 120 mile radius-**

**SACRED SITES that have ended up being submerged will be damaged and possibly destroyed-----**

**OUT OF THE AREA? you can still take 5 minutes to have your voices heard! EMAIL  
[PGSEismic@coastal.ca.gov](mailto:PGSEismic@coastal.ca.gov)**



[Like](#) · [\[Comment\]](#) · [Share](#) · [27325](#) · [2 hours ago](#) ·

## **Teufel, Cassidy@Coastal**

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**From:** Hedda Beckman <heddabeck@yahoo.no>  
**Sent:** Wednesday, October 24, 2012 11:19 AM  
**To:** CoastalPGESEismic  
**Subject:** Stop it!

If Seismic testing is approved, ALL MARINE LIFE WILL DIE with in a 120 mile radius-

SACRED SITES that have ended up being submerged will be damaged and possibly destroyed-----

## **Teufel, Cassidy@Coastal**

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**From:** robin123@efn.org  
**Sent:** Wednesday, October 24, 2012 12:14 PM  
**To:** CoastalPGESeismic  
**Subject:** stop seismic testing

If Seismic testing is approved, ALL MARINE LIFE WILL DIE with in a 120 mile radius-

SACRED SITES that have ended up being submerged will be damaged and possibly destroyed-----

so have a heart and a brain and don't kill and destroy anymore beings and structures. its really simple.

respect life.

thank you,  
bonnie palmer

## **Teufel, Cassidy@Coastal**

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**From:** Hanny <h\_braakhekke@hotmail.com>  
**Sent:** Wednesday, October 24, 2012 1:09 AM  
**To:** CoastalPGSEismic  
**Subject:** Disturbing coastal marine life California

Please Stop The Diablo Canyon Seismic blasting on the Central coast.

A Dutch lady begs you!

Hanny Braakhekke  
Arnhem, the Netherlands

**Teufel, Cassidy@Coastal**

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**From:** karen archer-hutchison <kdragonlady@gmail.com>  
**Sent:** Tuesday, October 23, 2012 8:41 PM  
**To:** CoastalPGESeismic  
**Subject:** Seismic slaughter of our oceans

I am unbelievably upset about this pending decision. I find this some of the most disturbing news of my life. What Lizard Brain on What Planet dreamt up this plan? By all accounts there was a huge outcry of protest by the residents of the areas surrounding Diablo Canyon when it was announced that it was to be built, right there on that big fat fault line. Who would PLAN, actually plan, to build a Nuclear Power Plant (always considered an accident waiting to happen) right on top of a HUGE faultline? Now we are told in order to save this abomination from being turned off (finally) we have to submit to a scouring of our ocean treasures, a literal SEISMIC SCOURING of our ocean and all it's life. Are you serious?

To make matters worse, it turns out the justification for this "testing" is rather bogus considering the lack of value of the results of said "testing" in regards to furthering knowledge of the faultline. Then to make matters worser I find out MY TAX DOLLARS have been allocated by ? to pay the whale killers 64 MILLION DOLLARS OF OUR TAX MONEY! This sounds like another scam created to advance the reckless, destructive, and continuous search for oil and natural gas ALL OVER THE WORLD via seismic "testing". A veritable natural resource grab? You people are complicit in promoting this immoral agenda. We are watching and waiting and so are our lawyers with their pens in their hands.

**Teufel, Cassidy@Coastal**

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**From:** Nate Leal <nate-is-great@hotmail.com>  
**Sent:** Tuesday, October 23, 2012 7:18 PM  
**To:** CoastalPGESeismic  
**Subject:** Please don't.

Hello Cassidy,

I am writing you to say, please don't blow out my eardrums...

I surf within a mile of where you plan to do seismic testing, and from what I understand it can do some serious damage to humans and animals alike. I implore you to reconsider. Feel free to contact me with any questions or thoughts.

Thank You  
Nate Leal  
(805) 909-9618

**Teufel, Cassidy@Coastal**

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**From:** Amber Barnard <ambernarnard@yahoo.com>  
**Sent:** Sunday, October 21, 2012 5:25 PM  
**To:** CoastalPGESeismic  
**Subject:** Seismic Testing...

Dear California Coastal Commission,

I am writing to ask that you would do all that you can to stop the Seismic testing from happening on the California Central Coast. As you know the Sonar blasting would harass, harm, and kill many of our diverse species, many of which are endangered species, and migrating whales. Our community depends on tourism and sea food. Our fishermen would be out of business. We had the largest gathering of Humpback Whales in Avila Beach a few weeks ago. This brought a lot of attention to the sea life here. This is also a Marine Protected Area. We have fought hard to get the sea life protected, and this would completely defeat that point. It is a sacred land that the Chumash Indians have lived on for centuries. And there are Sacred Sites below the water. Please hear the cry of the people of this land. Please do all you can to Stop the Diablo Canyon Seismic Testing.

Thank you,  
Amber Barnard  
Central Coast Resident

## **Teufel, Cassidy@Coastal**

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**From:** annette adams <bellaella21111@gmail.com>  
**Sent:** Sunday, October 21, 2012 12:34 PM  
**To:** CoastalPGSEismic  
**Subject:** CASSIDY TEUFEL...I LOVE THE CALIFORNIA COASTLINE AND DON'T WANT SEISMIC TESTING DONE THAT WILL HARM LIFE...

C. Teufel

I do not NOT want the PG&E or any other energy company to do seismic testing off the California coast. I am pretty sure you are looking for gas and oil but whatever your devious reasons...DO NOT USE YOUR MENACING AIR CANNONS off our coast Knowing more about the ocean floor will not NOT help any of us in the event of a quake...so prepare for a big one like in Fukusima by shutting down the ugly nuke plant that is old and run down. Go away

Annette Adams

Califronia native born in San Francisco and live in SLO

## **Teufel, Cassidy@Coastal**

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**From:** Dana Gibson <treemom532000@yahoo.com>  
**Sent:** Friday, October 19, 2012 8:03 PM  
**To:** CoastalPGESeismic  
**Subject:** please do not allow pg&e seismic testing off coast of morro bay

hi, we do not need these tests to find out how dangerous it is to have a nuclear power plant on top of or near several earthquake faults. the tests will kill much life in the ocean. it is time to decommission the nuclear power plant. the storing of the nuclear waste has never been dealt with. it is past time to switch to green, safe energy. please do not kill our marine life. and if you think that death will not happen, you are not being honest with yourself.

thank you  
dana gibson

## **Teufel, Cassidy@Coastal**

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**From:** Renee <renee@rightstepmarketing.com>  
**Sent:** Tuesday, October 16, 2012 10:01 PM  
**To:** CoastalPGESeismic  
**Subject:** Reconsider The Seismic Testing At Diablo Canyon

To Whom It May Concern:

I respectfully urge you to reconsider and use your influence to vote down the Seismic Testing scheduled for Diablo Canyon.

This is a terrible assault to the marine life environment that can be avoided.

Can you imagine if they were using the equivalent of the same testing in your neighborhood????? 260db sound blasts every 13 seconds, unceasing day and night for 30+ days????

Can you imagine what an effect it may have to your health by the end of such a testing period??? That is, if you "chose not to" or "could not" flee at the earliest opportunity.

Wildlife is a precious asset that the human family has been entrusted to protect against the selfish interest that would disrespect their right to share our planet.

They deserve better consideration. The number of "take" in the EIR are unacceptable. Level "A" Harrassment we know will lead to Level "B" injury and death in many cases.

This information being sought comes at too high a price. There has to be another way of collecting the data being sought while respecting and preserving resident wildlife.

I respectfully urge you to consider and use your influence to vote down the Seismic Testing scheduled for Diablo Canyon.

This is a terrible assault to the marine life environment that should not be tolerated.

Can you imagine if they were using the equivalent of the same testing in your neighborhood????? 260db sound blasts in their environment every 13 seconds, 24/7 for 30+ days????

Can you imagine what an effect it may have to your health by the end of such a testing period??? That is, if you "chose not to" or "could not" flee your neighborhood at the earliest opportunity.

Wildlife is a precious asset that the human family has been entrusted to protect against the selfish interest that would disrespect their right to share our planet.

They deserve better consideration. These number of "take" in the EIR are unacceptable. Level "A" Harrassment we know will lead to Level "B" injury and death in many cases.

This information being sought comes at too high a price. There has to be another way of collecting the data being sought while respecting and preserving resident wildlife.

Respectfully,

Renee Metoyer  
P O Box 10725

## **Teufel, Cassidy@Coastal**

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**From:** Greenpeace <info@wdc.greenpeace.org> on behalf of Joelle Ziemian <jziemian@gmail.com>  
**Sent:** Tuesday, October 16, 2012 3:06 PM  
**To:** CoastalPGESeismic  
**Subject:** This is not what PG&E stands for!

Oct 16, 2012

Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Dear Teufel,

I am extremely opposed to PG&E's proposal for seismic testing off California's central coast. Causing death and destruction of marine life does not fit the brand image PG&E has worked so hard to build.

Please do not do this.

People care and they are watching.

Joelle Ziemian

Sincerely,

Joelle Ziemian

20007

## **Teufel, Cassidy@Coastal**

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**From:** ISABEL AYALA <isabel-ayala@sbcglobal.net>  
**Sent:** Tuesday, October 16, 2012 10:14 AM  
**To:** CoastalPGESeismic  
**Subject:** Seismic Testing

Dear Sirs :

PLEASE SAVE US...Stop the Diablo Canyon Seismic Testing from occurring It will be 250 decibel Sonic Blasts every 15 seconds, 24 hours a day, from November 1st (new start date TBA) to December 31st effecting Guadalupe to Cambria, California. This will cause unimaginable Maiming and Killing of Ocean Life, Ecological Damage, Economic Hardship, and Loss to All Coastal Recreation and Tourism. Please save our whales, seals, dolphins and other valuable and loved sea creatures. This testing will harm our ocean creatures to a point where they may never recover. I beg you please not let this testing happen. Thank you for your attention to this matter.

Cheryl Marositz

**Teufel, Cassidy@Coastal**

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**From:** ISABEL AYALA <isabel-ayala@sbcglobal.net>  
**Sent:** Tuesday, October 16, 2012 10:14 AM  
**To:** CoastalPGESeismic  
**Subject:** Seismic Testing

Dear Sirs :

PLEASE SAVE US...Stop the Diablo Canyon Seismic Testing from occurring It will = 250 decibel Sonic Blasts every 15 seconds, 24 hours a day, from November 1st (new start date TBA) to December 31st effecting Guadalupe to Cambria, California. This will cause unimaginable Maiming and Killing of Ocean Life, Ecological Damage, Economic Hardship, and Loss to All Coastal Recreation and Tourism. Please save our whales, seals, dolphins and other valuable and loved sea creatures. This testing will harm our ocean creatures to a point where they may never recover. I beg you please not let this testing happen. Thank you for your attention to this matter .

**Angela Melendez**

**Teufel, Cassidy@Coastal**

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**From:** ISABEL AYALA <isabel-ayala@sbcglobal.net>  
**Sent:** Tuesday, October 16, 2012 10:11 AM  
**To:** CoastalPGESeismic  
**Subject:** Seismic Testing

Dear Sirs :

PLEASE SAVE US...Stop the Diablo Canyon Seismic Testing from occurring It will = 250 decibel Sonic Blasts every 15 seconds, 24 hours a day, from November 1st (new start date TBA) to December 31st effecting Guadalupe to Cambria, California. This will cause unimaginable Maiming and Killing of Ocean Life, Ecological Damage, Economic Hardship, and Loss to All Coastal Recreation and Tourism. Please save our whales, seals, dolphins and other valuable and loved sea creatures. This testing will harm our ocean creatures to a point where they may never recover. I beg you please not let this testing happen. Thank you for your attention to this matter .

***Isabel M. Ayala***

## **Teufel, Cassidy@Coastal**

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**From:** Greenpeace <info@wdc.greenpeace.org> on behalf of Wolfgang Rougle  
<twiningtreefarm@yahoo.com>  
**Sent:** Monday, October 22, 2012 8:10 PM  
**To:** CoastalPG&ESeismic  
**Subject:** Protect our coast from seismic testing

Oct 22, 2012

Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Dear Teufel,

I'm writing to oppose PG&E's proposal for seismic testing off California's central coast.

As PG&E's own EIR admits, the harm to ocean life will be unavoidable. The underwater cannons will deafen any blue whales, humpback whales, otters, dolphins and porpoises who happen to be in the region. Hearing loss for these animals can mean failure to find food, social isolation, inability to find a mate, and navigation problems. Many will certainly die as a result of their disabilities. The damage will not be limited to the large, intelligent and breathtakingly beautiful marine mammals, however: In the words of one local official, the testing "would cleanse the Point Buchon State Marine Reserve of all living marine organisms."

Our system of state marine reserves is there to provide a safe haven for biodiversity, not a slaughter ground for it. PG&E's proposal has no justification other than to provide a better picture of the underwater fault lines which may be jeopardizing the safe operation of a nuclear power plant. But why can't PG&E analyze the decades of data already collected by several sources to paint a full picture of geologic hazards near the power plant? Will new testing tell us the power plant is totally safe? If we doubt it will, why don't we just shut down the power plant now on the principle that it's better to be safe than sorry?

Ordinary Californians are widely suspicious that this seismic testing's real purpose is to "incidentally" provide underwater maps to enable eventual drilling for hydrocarbons. Whether that's true or not, there is no excuse for the kind of devastation the proposed cannons will unleash.

I urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Wolfgang Rougle

96022-8205

**Teufel, Cassidy@Coastal**

---

**From:** Cecile Cutler <ananda@mcn.org>  
**Sent:** Monday, October 15, 2012 9:07 PM  
**To:** CoastalPGESeismic  
**Subject:** No seismic testing, please

Dear Coastal Commission:

I join the people of Morro Bay, Los Angeles, Los Osos, Avila Beach and San Luis Obispo to oppose PG & E's proposals for seismic testing and using sound to measure the earthquake faults.

The blasts from the underwater air cannons have been known to kill whales, porpoises, sea lions, and all the life in the area around the cannon.

Thank you.

Cecile Cutler  
360 N McPherson St.  
Ft. Bragg, Ca. 95437

**Teufel, Cassidy@Coastal**

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**From:** Julianna Krolak <thegoldndrgrn@yahoo.com>  
**Sent:** Saturday, October 13, 2012 11:20 PM  
**To:** CoastalPGESeismic  
**Subject:** P G & E Seismic testing comment

Dear Coastal Commissioners,  
Please deny any permits associated with P G & E's proposed Central Coast acoustic seismic survey. Please deny any permits associated with this project due to the potentially devastating loss of marine life and devastating impacts to the fishing, tourist, and whale watching industries in the affected area.

Thankyou,  
Julianna Krolak  
(805) 320-7061  
31 Palm Ct. #C  
Santa Paula, CA 93060

**Teufel, Cassidy@Coastal**

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**From:** bigbear@mcn.org  
**Sent:** Saturday, October 13, 2012 3:11 PM  
**To:** CoastalPGESeismic  
**Subject:** No No No

I'm totally against the seismic testing and effects on ocean life and possible earthquake resulting from this testing so close to major faults.

Sam GitcheI

## **Teufel, Cassidy@Coastal**

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**From:** jundre Teixeira <jundre@gmail.com>  
**Sent:** Saturday, October 13, 2012 3:23 AM  
**To:** CoastalPGSEismic  
**Subject:** Seismic Testing

Dear Mr. Teufel,

I thank you for the fact that you are known for being accessible to the general public and that is why I am contacting you, as I am hoping you will take my message seriously.

I am a member of the public living most of my time with my family and grandchildren in the magnificent area of San Luis Obispo.

I am vehemently opposed to PG&E proposing to go ahead this fall with the seismic testing which is stated to be conducted in the Central Coast waters.

I realize that Bill AB42 was a safety bill brought in by the policymakers to protect Central Coast residents following the Japanese tragedy last year. I am sure you know the drawbacks of this too, and just how accurate is this going to be?

This testing comes at a huge cost to an already bankrupt state, and will this really benefit the public whom it is supposed to protect. Protect from what???

The actual cost of the devastation of the Central Coast unique and abundant marine life could be worse, especially for the future.

I know the fishing industry were first interested when they realized they could benefit by what they would get being compensated by PG&E for damage to the sea life in our waters, but now they are more interested in the preservation of our sea life.

Why are they being so selfish as to not think about our future generations.

We have to stop this testing debacle from happening and I am begging you to please use your influence.

Please acknowledge this e-mail, so that I know you have received it.

Many thanks,  
Jundre Teixeira



**Teufel, Cassidy@Coastal**

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**From:** Nicole Chastain Price <darlingnikki1172@gmail.com>  
**Sent:** Friday, October 12, 2012 12:58 PM  
**To:** CoastalPGSEismic  
**Subject:** Please stop seismic testing

Please, please, please stop the seismic testing off of our central coast. I live here in the Central Coast and just recently celebrated my first wedding anniversary visiting the coast and seeing the amazing sea animals-along with thousands of other tourists... If the porpoises, whales, seal lions and otters deaths and distress don't convince you perhaps the hundreds of thousands of tourists dollars lost due to this practice will. No one wants to go on vacation and see animals in distress, or worse, no animals because they will either die off or move away....

Sincerely,

Nicole Chastain Price

Sent by Pony Xpress-YeeHaw

## **Teufel, Cassidy@Coastal**

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**From:** Matthew P. Schwarberg <mschwarb@calpoly.edu>  
**Sent:** Tuesday, October 09, 2012 1:09 PM  
**To:** CoastalPGESeismic  
**Subject:** seismic testing prevention

PLease do not allow the diablo canyon seismic testing. It would be devastating to the ecosystem, local businesses, surfers/ocean goers, and community life as a whole. Please do your part to prevent it from happening. Protect our coasts. Protect our world.

Matt Schwarberg

**Teufel, Cassidy@Coastal**

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**From:** kate chase <chakase@gmail.com>  
**Sent:** Sunday, October 07, 2012 10:21 PM  
**To:** CoastalPGSEismic  
**Subject:** seismic testing offshore DCP

Dear Sirs,

Our families are long time residents of the Central Coast and are very concerned that the PG&E's proposed seismic imaging testing will be extremely harmful to the health of the marine life of the area, there is no requirement to actually change the safety structure of the Diablo Canyon Power Plant, this testing will violate the Endangered Species Act by harassing the whales with noise to make them move away, it will violate both the Marine Mammal Protection Act and the Magnuson-Stevens Fishery Conservation and Management Act, the local fishing industry which has finally redeveloped relatively decent fish stocks will be severely damaged which will have tremendous effect to the local economy, PG&E plans to pass the cost of testing on to ratepayers.

We can't believe this proposal has not already been thrown out.

Please do NOT allow this testing to take place.

Thank you,

Martha Chase

Katherine Chase

**Teufel, Cassidy@Coastal**

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**From:** milesjwallace <jalamafred@yahoo.com>  
**Sent:** Sunday, October 07, 2012 5:46 PM  
**To:** CoastalPGESeismic; cristasand@yahoo.com  
**Subject:** Seismic Testing

To whom it may concern,

I am a Santa Barbara County native and commercial fisherman whose livelihood depends on our natural resources health and vitality. We are, as fishermen, heavily regulated with severe penalties in order to maintain our fishes stocks, with good results as many fish stock levels have returned to sustainable levels from the overfished statuses they were down to years ago. I oppose seismic testing in our ocean and know the devastating effects it will have on these fish, as well as all marine organisms, are unknown, unforeseen and untold! I desperately urge you to STOP SEISMIC TESTING!

Sincerely,

Miles Wallace

**Teufel, Cassidy@Coastal**

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**From:** Rochelle Reed <rochelle\_me2@hotmail.com>  
**Sent:** Sunday, October 07, 2012 11:59 AM  
**To:** CoastalPGSEismic  
**Subject:** Seismic Testing Diablo Canyon

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From: [rochelle\\_me2@hotmail.com](mailto:rochelle_me2@hotmail.com)  
To: [c.teufel@coastal.ca.gov](mailto:c.teufel@coastal.ca.gov)  
Subject: Seismic Testing Diablo Canyon  
Date: Thu, 4 Oct 2012 12:12:46 -0700

Dear Mr. Teufel,

I am writing to you today to voice my urgent concern over the seismic testing that PG&E is hoping to conduct off of the Central Coast. Being a resident of the area my entire life, this affects me and my family. The price tag for this sonic mapping is far far too costly at \$64 million dollars, and the cost in marine life far too great for something that will not change anything at Diablo Canyon Nuclear Power Plant, an aging Nuclear Reactor that sits on ALREADY known earthquake faults and needs to be closed down immediately, not granted new license to stay operational longer. Please I urge you NOT TO APPROVE the project on October 10th!!

Thank you,

Rochelle Reed  
501 E. Chapel  
Santa Maria CA 93454  
805-363-2617

## **Teufel, Cassidy@Coastal**

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**From:** Vanessa Carbia <vcarbia@hotmail.com>  
**Sent:** Saturday, October 06, 2012 3:03 PM  
**To:** CoastalPGSEismic  
**Subject:** PG&E seeking approval for seismic testing on California's central coast

Attention: Cassidy Teufel  
California Coastal Commission

Dear California Coastal Commission:

I strongly oppose PG&E's proposal for seismic testing off California's central coast. This project would have dangerous and deadly impacts on marine life and the ocean ecosystems they depend on for survival. PG&E's own EIR clearly states unavoidable impacts to marine life. In regions where this sort of testing has been done, countless dead marine animals have washed ashore for weeks during and after testing, with blood dripping from areas such as their eyes, nose, ears or mouth — a sign that they have suffered catastrophic internal hemorrhaging.

The California coast is known for its rich ocean waters, and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing. Also, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, and new testing will only provide marginal improvement to what is already known.

I strongly urge you to deny this project and to protect marine life from this unnecessary project.

Thank you in advance for your thoughtful consideration.

*Vanessa Carbia*

**Gainesville, FL**  
**tel/cel/fax 352-336-4044**  
**cel 352-215-7200**

## **Teufel, Cassidy@Coastal**

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**From:** Laurie Tooch <laurtooch@msn.com>  
**Sent:** Saturday, October 06, 2012 2:57 PM  
**To:** CoastalPGESeismic  
**Subject:** Diable canyon

Good Afternoon,

I am writing to plead with you to listen to your heart. I know it will tell you that this kind of testing is needless. The results are minimal, and we already know that there is a fault there. We also know that Nuclear power is a very dangerous thing for our planet as a whole. I can tell you that having Nuclear plants on the ocean, in California is inviting disaster. Have we learned nothing from Japan? The world will never be the same since that incident. If this was the only power available, I would still opt for none. Mother earth gave us wind, solar, and water power that is neither dangerous nor depleting.

As well educated people, you know this to be true. There comes a time in the earths history where we must make a change. This planet has survived for millions of years without doing the damage that humans have done in the name of progress. Killing innocent sea life for a test sohorrendous, is irresponsible. We have a duty to protect our coastline and our planet as a whole. Please, if you are even reading this, put a stop to the madness!!

Thank you for your heartfelt consideration of this matter.

Laurie Tooch  
Newport beach, Ca

**Teufel, Cassidy@Coastal**

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**From:** Patrick Bang <xsharpie13@yahoo.com>  
**Sent:** Saturday, October 06, 2012 12:43 PM  
**To:** CoastalPGESeismic  
**Subject:** Please Stop Seismic Testing

Hello,

I am a central coast ocean enthusiast. Please do not proceed with seismic testing. It is unwanted by many and harmful to all.

Thank you,

Patrick Bang

[xsharpie13@yahoo.com](mailto:xsharpie13@yahoo.com)

**Teufel, Cassidy@Coastal**

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**From:** pegasus flying <pegasusnm@yahoo.com>  
**Sent:** Saturday, October 06, 2012 12:26 PM  
**To:** CoastalPGESeismic  
**Subject:** sounding of bombs

PLEASE STOP EXPLORATION WITHOUT CONSIDERATION!!!

That is my personal plea. We need to stop destroying the planet we live on before we go too far!

Thank you,

Peggy Schine

**Teufel, Cassidy@Coastal**

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**From:** Steve Howard <stevehowar@gmail.com>  
**Sent:** Saturday, October 06, 2012 11:59 AM  
**To:** CoastalPGESeismic  
**Subject:** Please stop the madness

We do not need seismic testing done here or anywhere in the worlds oceans. It is like taking bulldozers to Yosemite! What they no doubt are thinking about is mapping out natural gas, oil, minerals et al. for profit? At what expense? We want to commune with nature not destroy it with 260 db blasts every 13 seconds. Hogwash it is. A jet engine is about 140 db if you stand 100 ft away is it readys for take off. It is **unbelievably loud!! This will kill everything around it. Please stop!**

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Please let me know if you have any other questions or concerns.  
Kindest Regards,

Steve Howard

Sales Manager  
Trailer Hitch RV 805 929-8095 [WWW.Trailerhitchrv.com](http://WWW.Trailerhitchrv.com)

Steve Howard Photography 714 251-4410

Please visit my photo website at

<http://stevehoward.smugmug.com>

## **Teufel, Cassidy@Coastal**

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**From:** smoran1945@comcast.net  
**Sent:** Friday, October 05, 2012 9:44 PM  
**To:** CoastalPGESeismic  
**Subject:** PG&E Seismic testing

To: Cassidy Teufel

I am writing to voice my opposition to the proposed seismic testing PG&E is requesting in the waters around the El Diablo Nuclear Power Station. The seismic testing will be extremely destructive to the marine life and the proposed 'take' PG&E has requested is appalling. The 'take' count reads...

One Sei whale, two Minke Whales, a single Sperm Whale, 3 Humpback Whales, 6 Mesoplodont beaked whales, 7 Killer whales, 7 Baird's Beak Whales, 14 Fin Whales, 26 Cuvier's Beaked Whale, 33 Blue Whales, 357 California Gray Whales. Dolphins of many kinds, 4 Striped Dolphins, 8 Small Beaked Whales, 38 Northern Right Whale Dolphins, 81 Dall's Porpoise, 385 Long-Beaked Dolphins, 178 Risso's Dolphins, 269 Pacific White-Sided Dolphins, 3,044 Bottlenose Dolphins and 10,036 Short-Beaked Dolphins...6,085 California Sea Lions, 175 Northern Elephant Sea, and 49 Guadalupe fur seal, untold sea turtles of various varieties, countless fish and bird species and the next generation of sea life. This amounts to thousand of sea life large and small and many more uncounted.

Tom Franciskovich states in his article in SLO Life: "While policymakers' intentions appear to be noble—looking after the safety of Central Coast residents—it is not entirely clear how the results of seismic testing would achieve that goal. Just how do highly detailed three-dimensional maps of the area's spider web of fault lines change anything currently taking place at Diablo Canyon? There is nothing that can be done to, say, add steel bracing to shore up a fault line here or fill in with cement a fault line over there. Eventually they will produce an earthquake. That's just what faults do and there is nothing that can be done to stop it. And it is unclear how the information we gain by doing the testing, which may or may not—depending on who you ask—come at a great cost to our sensitive local marine ecosystem, would mitigate the disaster resulting from a massive earthquake. It would be one thing if seismic testing was able to forecast earthquakes. For example, if by doing this we knew that next summer the Hosgri fault would produce somewhere between a 7.0 and 8.0 earthquake, then that would certainly change the equation, but predicting earthquakes with seismic testing has long been debunked—it just doesn't work. Any way we slice it, for better or worse, we are left with an aging nuclear power plant resting upon a hotbed of seismic activity perched on the side of an ocean cliff. Besides, no amount of retrofitting, it seems, could have prevented the Japanese meltdowns resulting from what turned out to be a 9.0 earthquake. Realizing this reality, Japan last month announced that it is phasing out all 50 of its nuclear reactors by 2040".

Not only is it questionable that the seismic testing will be of any real value, PG&E will pass the estimated cost of \$64 million on to its customers which in my opinion is adding insult to massive injury. A power station built on a fault line is way past foolish, and no amount of testing will change the fact that there is a strong possibility that we could end up with a situation similar to Japan's after the tsunami.

Please do not go forward with this plan that will most definitely decimate large numbers of sea life, cost the customers of PG&E 64 million dollars, and in the end, not change the fact that the power station is still built on a fault line that will eventually slip causing who knows what kind of destruction

**Teufel, Cassidy@Coastal**

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**From:** Rita Meehan <rita.meehan@gmail.com>  
**Sent:** Friday, October 05, 2012 6:22 PM  
**To:** CoastalPGESeismic  
**Subject:** diablo testing, recommendation

Hi Cassidy.

I spoke to you last week about the recommendation you prepared for the Diablo testing, however I couldn't find it on the website. Could you direct it to me? As you know, I am very concerned about the impact it would have to my friends in the sea.

thanks!  
Rita

## **Teufel, Cassidy@Coastal**

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**From:** Marie Trout <marie@waltertrout.com>  
**Sent:** Friday, October 05, 2012 4:41 PM  
**To:** CoastalPGESeismic  
**Subject:** Diablo Canyon Project

To The California Coastal Commission,

I urge you to take into consideration that untold sea animal life, our fragile ecosystem, will be affected with the Diablo Canyon Project and the SONGS project.

The projects will kill thousands of sea animals. And I urge you to find a much more sustainable solution. We can develop green energy projects that would make the Nuclear Plants obsolete. We can use natural gas. I am hoping you and other officials will show real vision and leadership and find a sustainable solution short term as well as long term that does not put our aquatic friends' lives in jeopardy. Ultimately the goal being that we also keep both animals and Ocean Conditions in general healthy for our children and their children.

Respectfully,  
Marie B Trout



Manager/CEO Fish-Net Productions, Inc.  
Walter Trout Personal Management  
Phone: 714 235 7749  
[www.waltertrout.com](http://www.waltertrout.com)

## **Teufel, Cassidy@Coastal**

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**From:** Matthew P. Schwarberg <mschwarb@calpoly.edu>  
**Sent:** Thursday, October 04, 2012 10:02 PM  
**To:** CoastalPGESeismic  
**Subject:** concerns with seismic testing

Hello,  
I am very concerned about the seismic testing for diablo canyon power plant. I am 100 % against it and hope and pray that it doesn't go through. Please, please, please do all that you can to stop it from happening. I have an ocean dependent business that will be unable to operate during the period of time the testing is being done, which will severely hurt my ability to support myself and my family. Also, obviously it will be detrimental to the ecosystems and life up and down the coast. Please do all that you can to stop it from happening. Thank you.

Sincerely,  
Matt Schwarberg

**Teufel, Cassidy@Coastal**

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**From:** Gee Whizz <geewhizz52@gmail.com>  
**Sent:** Thursday, October 04, 2012 6:49 PM  
**To:** CoastalPGESeismic

To whom it may concern,

I am writing to express my opposition to the Diablo Canyon seismic testing. I don't understand how the testing could be considered when it can kill and/or severely hinder the lives of so many animals and species. This would never be considered on land due to the ASPCA, so what's the difference. Why does PGE have the write to kill animals?

Simon Evans

Melbourne

Australia

## **Teufel, Cassidy@Coastal**

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**From:** Madonna Dunbar <madonna\_dunbar@yahoo.com>  
**Sent:** Thursday, November 01, 2012 4:33 PM  
**To:** CoastalPGSEismic  
**Subject:** No seismic testing for Diablo Canyon

Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division

I am writing to voice my vehement opposition to the proposed PG&E seismic testing in the ocean outside Diablo Canyon. My family lives in the Oceano, CA area, and I visit the Central Coast often.

The earthquake threats to Diablo Canyon are known. There is no way to adequately measure what these earthquake faults are capable of producing. The Diablo Canyon plant can sit there thinking it's ready for a 9.0 quake and still not be adequate.

**So put the money into retrofitting the plant instead of wasting money on unnecessary testing that will do more harm than good!**

The impacts to marine life from extended sonic testing IN A MARINE SANCTUARY have the potential to be devastating to the ocean wildlife that live there, and seriously affect the area's recreation based economic livelihood.

The state study mandated by Assembly Bill 1632, found the project likely to have "unavoidable adverse effects" on marine life and the environment. Citizens of San Luis Obispo County, SLO County Commission, biologists, environmental groups, fishermen and resort based businesses and persons have opposed using the high-energy air guns, for the reasons that the blasts have tremendous potential to harm endangered whales, California sea otters and other creatures in these waters.

Please honor the will of the community; stop the testing and work on the facility infrastructure; better yet CLOSE IT DOWN!

Sincerely,

Madonna Dunbar

Resource Conservationist

Incline Village, NV

## **Teufel, Cassidy@Coastal**

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**From:** KRISTIN BAUER <kbcauses@gmail.com>  
**Sent:** Thursday, November 01, 2012 12:48 PM  
**To:** CoastalPGESeismic  
**Subject:** Diablo Canyon Seismic testing

I am an actress and I also pay attention to what is being done to nature.

The Diablo testing is suspicious. We know we are on faults, this will harm sea life and not protect humans ultimately.

The fact that you say you will be mindful of sea life...well, no one is ever mindful of sea life. These kind of statements mean nothing to us. We re used to companies lying to us — we juts witnessed BP and still are.

If this testing disturbs one dolphin I am against it. And I will FB and tweet so. It is unacceptable.

Kristin Bauer van Straten

**Teufel, Cassidy@Coastal**

---

**From:** mc@studiostatue.info  
**Sent:** Tuesday, October 23, 2012 4:22 PM  
**To:** CoastalPGESeismic  
**Subject:** Request for no Seismic Blasting on Central Coast

Hello,

It is our governance as human beings to watch out for the creatures of the earth,  
stop the Diablo Canyon Seismic blasting on the Central Coast.

Thank you for your consideration.

Merna Chance  
Central Valley California Farmer

## **Teufel, Cassidy@Coastal**

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**From:** Greenpeace <info@wdc.greenpeace.org> on behalf of Phillip Price  
<psignup@creekcats.com>  
**Sent:** Tuesday, October 16, 2012 12:04 PM  
**To:** CoastalPGESeismic  
**Subject:** Seismic testing kills whales

Oct 16, 2012

Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Dear Teufel,

Please deny PG&E's request to do seismic testing off the California coast. It will cause great harm to the natural ecosystem while providing an extremely modest amount of new information about earthquake risk.

I'm 47 years old and am cynical by nature but I have to say that even I am flabbergasted that a project like this is being proposed, especially for a marine reserve.

Say no.

Sincerely,

Phillip Price

94709



“The WHALE TAIL<sup>®</sup> Grants Program distributes funds from sales of the WHALE TAIL<sup>®</sup> License Plate. The grants support programs that teach California’s children and the general public to value and take action to improve the health of the state’s marine and coastal resources.”

October 8, 2012

California Coastal Commission  
Energy & Ocean Resources  
Cassidy Teufel  
45 Fremont Street, Suite 2000  
San Francisco CA 94105  
(415) 904-5502  
(415) 904-5400 fax  
PGSEismic@coastal.ca.gov

Dear California Coastal Commission,

**“PG&E is requesting to “take” 78 California gray whales, 11 humpback whales, 12 blue whales, 1,468 short-beaked dolphins, 66 long-beaked common dolphins, 152 Pacific white-sided dolphins, 91 Northern right whale dolphins, 1,321 bottlenose dolphins, 849 California sea lions, 1,188 Southern sea otters, and 3,736 Morro Bay harbor porpoises, among others.” (New Times article by Matt Fountain).**

It would be cruel and inhumane to subject highly intelligent mammals that utilize sonar to survive to the damaging blasts necessary to conduct seismic testing. It would surely mean a horrible slow death to many of them. To me, we would be conducting something just as, or even more horrific than the annual dolphin kill in Japan. The Gray Whale has come back from near extinction, its numbers are still limited, and yet, seismic testing is planned as they make their annual migration through the very area the testing is to take place.

The Coastal Commission espouses on its own page the importance “to value and take action to improve the health of the state’s marine and coastal resources.”

Please do not allow the Seismic Testing slated to take place. It is too large a threat to the irreplaceable resource of marine life that resides within and passes through the testing area.

Earnestly,

Cindy Fear  
317 E. Cherry Ave.  
Arroyo Grande CA  
93420

1266 INDIVIDUALS HAD SUBMITTED THIS LETTER VIA EMAIL AS OF 6PM ON 11/1/2012

**From:** [Greenpeace](#) on behalf of [Lisa Feldman](#)  
**To:** [CoastalPGESeismic](#)  
**Subject:** Protect whales from dangerous seismic testing  
**Date:** Thursday, November 01, 2012 5:06:13 PM

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Nov 1, 2012

Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Dear Teufel,

I'm writing to express my opposition to PG&E's proposal for seismic testing off California's central coast.

This project could have dangerous and deadly impacts on marine life and the ocean ecosystems they depend on for survival.

PG&E's own EIR clearly states unavoidable impacts to marine life. The California coast is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

I urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Lisa Feldman

43123

## **Teufel, Cassidy@Coastal**

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**From:** Anya <goldenanya@gmail.com>  
**Sent:** Wednesday, October 10, 2012 12:26 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Seismic Testing

Please STOP PLANS FOR SEISMIC TESTING!!!!

There will always be a threat for natural earthquakes (and ones that are too big to ever plan for), and there will always be the human threat for bigger and more destructive bombs, so the money and energy for this testing and upgrading the power plant need to be used to develop different sources of electricity. We can save the precious and irreplaceable earth we live on and save the lives of people living near the power plant if things are SERIOUSLY reconsidered. I think it's time to get real.

Anya

## **Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Tuesday, September 11, 2012 12:03 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: My concerns for Marine Life well being

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**From:** PAULINE GOSTLING [<mailto:lena.gostling@virgin.net>]

**Sent:** Tuesday, September 11, 2012 5:58 AM

**To:** Carl, Dan@Coastal

**Subject:** My concerns for Marine Life well being

I am writing to you, as I am concerned about the devastating and destructive effect the proposed seismic testing will have on the marine life around the Pacific Gas & Electric plant located on the Central Coast of California. As all the info regarding this issue is freely available on the Internet for you to look at yourself, I will get straight to my point:

These life forms are all essential to the well being of 'Our' Planet, and I do appreciate and understand safety tests are required, but why do they have to kill or maim any life? If these weren't creatures, but were your families, friends, the public, if they were HUMANS, I really don't think these tests would be considered at all.

Included in the marine life are beautiful and magnificent creatures as well as essential life forms that you can't even see and I just can't understand how anyone would be happy to allow this destruction to happen?

I ask you to at least look into this please, if not for me, for yourself, for humanity.

I don't know if little old 'ME' way over in little old England can do any good, but I'm going to try, and at least my concerns should be listened to. And all the little old voices from all over the world should be listened to, after all, if we have taken the time and effort to contact you, then you should really reciprocate with your time and effort to look into this.

You may wonder why I'm even bothered about all of this, over here in England? I'm not a 'crack-pot'. I'm just an ordinary 42-year-old wife and mother who works in payroll. Well this is my planet too and I care what happens to it, so I thought I'd write to you and tell you that ☺

Thank you for reading my comments and not just deleting or recycling them.

Regards  
Lena Gostling  
Stoke Ferry, Norfolk, England.

## **Teufel, Cassidy@Coastal**

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**From:** Toby Champion <frcampion@yahoo.com>  
**Sent:** Sunday, September 16, 2012 11:25 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** from a fellow traveler of the Chumash

Dear Cassidy...We would like to join our voices in protest of the sound experiment planned to take place off Morro Bay in Nov and Dec. We consider this an outrage, highly disrespectful to our relatives in the ocean such as the dolphins and whales. The recent disaster off Peru adds substance to the charge that these high decibel shenanigans are indeed damaging to the fauna of the ocean. Thank you for passing along our opinion to those in charge of decision making...Respectfully, Toby and Anita Champion

## **Teufel, Cassidy@Coastal**

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**From:** Pam Arment <pjarment@yahoo.com>  
**Sent:** Thursday, September 20, 2012 4:54 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Opposition to PG & E testing

Dear Coastal Commissioners,

At the State Lands Commission hearing on August 20, 2012 I stated the following at the public comment period from Morro Bay. I would like this to go on record to you in my opposition to PG & E's testing.

***This State Lands Commission must determine whether the public's need for the survey data is sufficient to outweigh environmental and socio-economic concerns. It's not.***

***PG & E probably has enough information on the fault lines through their low energy 2D tests that they've done already over the past two years. There's enough time for them to provide the required information for their 2015 deadline assessment. I question the need to do this high energy test now where the harm is much greater than any benefit of such testing. This isn't the place to experiment.***

***There is no guarantee that PG & E will even have to upgrade after any results of further testing. But it will guarantee they're doing what they have to get to renew their license. This looks to me like a bail out for PG & E. We ratepayers will have to pay \$64 million to destroy the town we live in and our ocean wildlife for PG & E to comply with what they have to do. How do you mitigate such destruction to all the businesses that rely on the ocean wildlife? What mitigation could there be for the lives of dolphins and whales that will be killed?***

***The majority of people here don't know about the extent of the damage or cruelty to mammals, they only know that seismic tests will be done Local new articles and TV reports have not mentioned once the extent of the damage to mammals for miles and miles up and down the central coast. Most people will find out when it's too late.***

***Morro Bay's tourist brochure features all the sea life here. There's no place like Morro Bay. It is unique. It's a tourist town. It's motto is "discover your better nature". This town survives on tourism; a place to come with the family and watch the sea creatures up close. It's the only place that you can walk down to the water on any given day and see otters, sea lions, egrets and pelicans up close. It's packed full of wildlife - like no other place I've seen in California. The birds won't stay if the fish are gone. The otter will be gone. The sea lions will be gone. All that will be left is people - unhappy people!***

***As the lead agency, if you approve the permit, other agencies are sure to follow. You have the ability to stop the insanity right here.***

***Morro Bay will get nation attention now which would normally be great, but the devastation to our ecosystem and killing of mammals won't be the good kind of publicity. And national coverage of our nuclear plant around these fault lines will get the national attention too. I can't imagine that Gavin Newsom will want to be known for this action to destroy so much.***

The only other thing I want to mention at this point is that your commission brought up the invasive species from Japan reaching our coast. If the ocean is cleared out by this test, aren't we making way for these species to have the place to themselves? ... and earthquakes, after this test was done in Peru there was an earthquake, after this test was done in Costa Rica there was a earthquake. When you fool around with Mother Nature like this we just can't predict what can happen especially when they've admitted they do not know of long term effects.

Thank you for your consideration and time. I hope you commissioners will do the right thing and stop or at least delay this until further investigation and thoughts are in place.

Sincerely,  
Pam Arment

## **Teufel, Cassidy@Coastal**

---

**From:** al barrow <a.barrow@charter.net>  
**Sent:** Thursday, September 20, 2012 7:57 PM  
**To:** Aaron Ochs; Abe Perlstein; 'Alissa Feldman'; 'Ann Calhoun'; Ann Kudart; 'Barry Branin'; 'baywoodrealty: charter.net'; bcuddy@thetribunenews.com; Ben DiFatta; betty; bev; bmorem@thetribunenews.com; Bryn Smith; California OneCare Walter Heath; Teufel, Cassidy@Coastal; Lester, Charles@Coastal; chuck; 'Debby Grisanti'; 'Elaine Watson'; elquadrillo@charter.net; Fantasy Art by Cara and Christi Brown; fjaunion@aol.com; fmecham@co.slo.ca.us; 'Fred Dellagatta'; Gary Freiberg; george and gwen taylor; jack beardwood; jaime bea; 'Jan Harper'; 'Janice Rohn'; jay bonestell; Jeanne Hardebeck; jerry waidner; john; john; larry raio; lars lindgren; leo; Leon Goldin; 'Linde Owen'; mandy; marie; mary mccurnin; mike saunders; 'Mimi Whitney'; monnica hunter; nathaniel blair; neil; 'Paul Malykont'; Piper Reilly; Rob Stout; 'Ron Crawford'; roslynjean@aol.com; sahernandez@co.slo.ca.us; 'Vicki Milledge'; Vivian Krug; Wade Rathke  
**Cc:** 'a.barrow: charter.net'  
**Subject:** Save humpback and blue whales from seismic testing in California!

Dear Friend,

The blue whales, humpback whales, sea otters, dolphins and porpoises living off of California's central coast are at serious risk of coming under attack from deadly seismic testing.

An energy company called Pacific Gas & Electric (PG&E) is trying to get approval to continue operating a dangerous nuclear power plant that sits at the intersection of multiple earthquake fault lines.

According to one local official, the testing PG&E is planning would "cleanse the Point Buchon State Marine Reserve of all living marine organisms." We can't let that happen.

Join me and take action by telling the California Fish and Game Commission to block PG&E's reckless seismic testing plan and to protect whales off the coast of California.

[https://secure3.convio.net/gpeace/site/Advocacy?cmd=display&page=UserAction&id=1180&s\\_src=TAF&s\\_su\\_bsrc=Email](https://secure3.convio.net/gpeace/site/Advocacy?cmd=display&page=UserAction&id=1180&s_src=TAF&s_su_bsrc=Email)

## **Teufel, Cassidy@Coastal**

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**From:** Jkimcrowder@aol.com  
**Sent:** Monday, September 24, 2012 3:04 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** seismic testing

Here is a letter I have sent to local newspapers. I am shocked that this seismic testing may be allowed to destroy our precious central coast marine environment. I am a docent for Friends of the Elephant Seal and associated with California State Parks. I hope the Coastal Commission will not approve this:

A seismic survey of the ocean floor by PG&E would emit sounds at such high decibels that they would not just scare the animals away, but could do irreparable damage to the ocean ecosystem. In the report "Findings for Central Coastal California Seismic Imaging Project," PG&E writes: "Noise generated underwater during the seismic survey would adversely affect marine mammals by either masking other noises needed for survival" (such as whale songs and calls); "disturbing their behavioral patterns" (such as migrations of whales and elephant seals and birthing of seals, otters and sea lions); "resulting in temporary or permanent hearing loss; or causing other physiological effects, such as stress or immune response."

The same report offers "mitigation measures," but in its summary, concludes that in spite of those measures "the impact is significant and unavoidable." This is a phrase that is repeated over and over in the document.

Other sections of the report acknowledge "significant and unavoidable" impacts to fish and fishing and boating activity, to the air quality from emissions from the vessels doing the surveying, and slightly less significant hindrances to such human activities as swimming, diving, and surfing—as long as those swimmers, divers and surfers are aware of the seismic testing activities.

"Disturbance" is much too kind a word. Hearing loss, migration changes, and even death should be considered. The report acknowledges that "mortality" is a possibility. The worst case scenario is that our beaches and bays could become littered with the stench of dead fish, giant rotting whale carcasses and the corpses of seals, otters and dolphins.

Ironically, this testing is not really necessary. The earthquake faults have been mapped before. We know they are there and we can't do anything about them.

**Teufel, Cassidy@Coastal**

---

**From:** LEONARD J BERRY <lbval@sbcglobal.net>  
**Sent:** Monday, September 24, 2012 6:37 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** OPPOSED to Seismic Testing off central California coast

Honorable Coastal  
Commissioners,

As a resident 5 miles downwind from Diablo Canyon Nuclear Plant I know that my safety is not of any concern to PGE. Marine Mammal Sanctuaries and Federal Laws protecting marine life also don't matter to PGE. PGE spokesman at today's Fish and Game Commission blazently told all of us what matters to PGE--MONEY. I will not be safer if this seismic testing is approved and the destruction of the marine life is not acceptable as so clearly reasoned and stated by the Fish and Game Commissioners at their meeting today. We all expect a utilities company to be concerned about money; that is the reason that we have trusted entities such as yourself to protect us and our marine life. As a 35 year resident of this area I am well aware of the power of The Coastal Commission. Thank you for your tireless and well reasoned, and ethical decisions that keep us safe and preserve our beloved and irreplaceable marine environment including protected sanctuaries enjoyed by locals and visitors from around the world. This will be a landmark decision. I trust that you will deny this permit.

R

espectfully,

Valarie

Bennett

Arroyo Grande, California

**Teufel, Cassidy@Coastal**

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**From:** joanna Darden <seacrystal777@hotmail.com>  
**Sent:** Monday, September 24, 2012 7:08 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** STOP

DO NOT DESTROY US..THE PEOPLE OF THE CENTRAL COAST YOU FOOLS....AND THE CREATURES..OMG..WHAT ARE YOU THINKING..PLEASE HELP ALL OF US...

*Joanna*

**Teufel, Cassidy@Coastal**

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**From:** Sierra Club <information@sierraclub.org> on behalf of Alexander Smith  
<alpoalex@yahoo.com>  
**Sent:** Monday, September 24, 2012 11:19 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** NOOOOO to Seismic Testing in Morro Bay

Sep 25, 2012

California Coastal Commission

Dear Commission,

How about this: don't do seismic testing for the Morro Bay nuclear power plant (that will harm marine life), and just decommission the plant altogether.

Nuclear power is a horrible solution for power and dangerous no matter how safe a plant appears to be. Even if the plant were to pass a seismic test, nuclear power should be abandoned. Let's not kill a bunch of our marine life just to keep an antiquated form of energy generation alive.

Sincerely,

Alexander Smith  
1315 Shippee Ln  
Ojai, CA 93023-9330

## Teufel, Cassidy@Coastal

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**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 9:45 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Please deny PG&E

Charles Lester  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

-----Original Message-----

From: James Dorsey [<mailto:whalekeeper@yahoo.com>]  
Sent: Tuesday, September 25, 2012 9:19 AM  
To: Lester, Charles@Coastal  
Subject: Please deny PG&E

Dear Mr. Lester,

It is imperative that you deny the PG&E project.

As one who has spent most of my life on the water, I have seen first hand the effects such experimentation has on wildlife and this initiative will only harm marine animals, especially large cetaceans. They are an integral part of the puzzle of life and to remove them from the equation would be another step on the slow death of this planet.

You have the opportunity to choose life over corporate profits.

Sincerely,

James Michael Dorsey  
(310) 836-4439  
website, <http://www.jamesdorsey.com/>

## Teufel, Cassidy@Coastal

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**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 10:19 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: PG&E Seismic exploration

Charles Lester  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

-----Original Message-----

**From:** Thomas Yeates [<mailto:tyeates@arrowflight.com>]  
**Sent:** Tuesday, September 25, 2012 10:06 AM  
**To:** Lester, Charles@Coastal  
**Subject:** PG&E Seismic exploration

Dear Charles,

Please do everything in your power to stop PG&E's insane sonic "air cannons" from assaulting the California coast. Whoever dreamed up this outrage at PG&E needs to be fired.

Sincerely  
Thomas Yeates

## **Teufel, Cassidy@Coastal**

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**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 12:41 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: testing

Charles Lester  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

-----Original Message-----

**From:** Carrie Durkee [<mailto:cdurkee@mcn.org>]  
**Sent:** Tuesday, September 25, 2012 12:29 PM  
**To:** Lester, Charles@Coastal  
**Subject:** testing

Hello

It seems beyond belief that you and yours could do this kind of damage to live animals in the ocean.  
Please think of what your children would think, if they knew.  
Carrie Durkee

## **Teufel, Cassidy@Coastal**

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**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 1:01 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: [OPC] URGENT PROTEST OVER P G & E HI ENERGY SEISMIC PROJECT  
**Attachments:** Attached Message Part; Attached Message Part  
  
**Importance:** High

**Charles Lester**  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

---

**From:** Mitch Clogg [mailto:mitchc@mcn.org]  
**Sent:** Tuesday, September 25, 2012 12:53 PM  
**To:** discussion@lists.mcn.org; Lester, Charles@Coastal  
**Subject:** [OPC] URGENT PROTEST OVER P G & E HI ENERGY SEISMIC PROJECT  
**Importance:** High

That we do this, to thinking, sea-bound, helpless creatures, is OBSCENE. In a sane world, it would be a dire felony, a hanging offense. It doesn't just bring death, it brings agony, disorientation, disintegration of senses and unimaginable terror--THEN death. IS THERE ANY DEBATE OR UNCERTAINTY IN THIS? THIS IS NOT A RHETORICAL QUESTION.

Nobody but humans can inflict this. Nobody but humans can fully grasp this. Nobody but humans can stop it and finally FORBID IT. If we have compassion and understanding, WHAT OTHER RATIONAL CHOICE IS THERE?

PG&E, despite a cockeyed law, is not a human. The California Coastal Commission is--a collection of responsible humans.

I FORMALLY REQUEST THAT THIS BE PLACED IN THE CALIFORNIA COASTAL COMMISSION FILES AND ON THE RECORD.

Thank you.

Mitch Clogg  
Mendocino

On 9/24/2012 9:39 PM, Elaine and Ed wrote:

## from the California Gray Whale Coalition

Dear Friends,

It's vitally important that we pick up pen to paper ( email) to CEO of the California Coastal Commission to request that the CCC denies the PG& E project. The nuclear power station is concerned, as a result of Fukushima, that the seabed could cause problems in the event of an earthquake.

A high energy seismic event is planned from September through to possibly February impacting the Gray whale migration and potentially, any western Grays which are now migrating down the California Grays' migration route into the Baja Lagunas.

Gray whales are highly sensitive to low, mid and hi frequency sonar and this experiment which is designed to go seven days a week, non stop is also likely to drive the whales offshore where they are at risk from transient orcas and sharks. Especially as many newborns are now being born at sea.

One of our Board members, Charmaine Coimbra lives in Cambria and she, together with our Central Coast Director, Hunter Kilpatrick are on the job I@

I m pasting below information from Charmaine together with the email for the CCC CEO. Please do take action as its not only Gray Whales which will be impacted but other whale species as well. Charmaine's excellent blog can be found

at: [www.Neptune911.wordpress.com](http://www.Neptune911.wordpress.com)

This summer, Pacific Gas and Electric (PG&E), owners of the central coast nuclear power plant, began "low energy" seismic exploration to better understand the faulting along the ocean's real estate that could impact the power plant.

The decibel level to shatter glass is over 100dB. So a jackhammer at 95 db would just irritate nearby neighbors and not shatter their wine glasses. A jet engine produces about 140dB. Hearing tissue dies at 180 dB

Here's what PG&E proposes as reported by Dan Bacher for the Daily Kos: *According to a PG&E representative at an informational meeting, the proposal calls for a 240-foot ship to tow a quarter-mile wide array of twenty 250 decibel "air cannons," along a 90-mile stretch of California's Central Coast. The cannons will shoot deafening underwater explosions once every twenty seconds, day and night, for 42 days and nights. The region of California's Center where this devastating assault on wildlife is expected to take place includes the "protected" Point Buchon State Marine Reserve.*

"Takes of Marine Mammals Incidental to Specified Activities; Marine Geophysical Survey off the Central Coast of California, November to December, 2012," is a National Marine Fisheries Service (NMFS) document that reviews the survey specifics as related to local marine mammals and marine life.

The 116-page report s: "To avoid the potential for injury, NMFS (1995, 2000) concluded that cetaceans and pinnipeds should not be exposed to pulsed underwater noise at received levels exceeding 180 and 190 dB re 1  $\mu$ Pa (rms), document "Takes of Marine Mammals

Here's the list as noted on the *Daily Kos*:

One Minke Whale,

2 Sperm Whales,

5 Dwarf Sperm Whales,

15 Blue Whales and

97 California Gray Whales,

25 Fin Whales,

13 Humpback Whales,

a single Short-Finned Pilot Whale,

3 Baird's Beak,

7 Killer Whales,

8 Striped Dolphins,

8 Small Beaked Whales,

81 Dall's Porpoise,

82 Long-Beaked Dolphins,

98 Risso's Dolphins,

114 Northern Right Whale Dolphins,

198 Pacific White-Sided Dolphins,

1,652 Bottlenose Dolphins,

1,834 Short-Beaked Dolphin

76 Harbor Seals,

Countless numbers of turtles.

PLEASE EMAIL CHARLES LESTER, CEO OF THE CALIFORNIA COASTAL COMMISSION AT: [clester@coastal.ca.gov](mailto:clester@coastal.ca.gov)

Best regards, Sue Arnold, CEO California Gray Whale Coalition

**Teufel, Cassidy@Coastal**

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**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 1:26 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: PG&E seismic testing offshore

**Charles Lester**  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

---

**From:** Antonia Lamb [<mailto:antonia@mcn.org>]  
**Sent:** Tuesday, September 25, 2012 1:12 PM  
**To:** Lester, Charles@Coastal  
**Subject:** PG&E seismic testing offshore

to: Charles Lester, California Coastal Commission  
and all comissioners  
Dear Mr. Lester et alia

I am appalled by PG&E's plan to kill, deafen, seriously injure and destroy precious marine life in the name of further destructive energy practices and sources. Not only is this in support of an aging and unsafe nuclear plant located on an earthquake fault, it is timed to impact the gray whale migration and birthing process. . The list of 'permitted' kills is horrifying and in the thousands. I demand as a citizen of this state and nation and planet that you live up to your responsibility as a human being on a very small and seriously challenged planet and deny this request.

(PG& E now wants permission for a 240-foot ship hauling a quarter-mile wide array of twenty 250 decibel "air cannons," along a 90-mile stretch of California's Central Coast. These cannons will shoot deafening underwater explosions once every twenty seconds, day and night, for 42 days and nights. The area where this devastating assault on wildlife is expected to take place includes the "protected" Point Buchon State Marine Reserve.)

This is inhumane. It is criminal. Please stand up for the Coast and protect its living, precious, rare, necessary creatures even if they are not human. We can't afford to lose any more. We don't need any more Fukushima-like disasters here in California either.

sincerely

Antonia Lamb

ps: please put my letter in the record and share it with all the commissioners. Thank you!

antonialamb.com  
P.O.Box 395 Mendocino CA 95460  
707-937-0119

On the radio - KMUD.fm 911, kmud.org, Redway CA  
last Wed. of the month 10-noon, mini-forecast every Wed. at 11:05 am

## Teufel, Cassidy@Coastal

---

**From:** Lester, Charles@Coastal  
**Sent:** Tuesday, September 25, 2012 2:53 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW:

Charles Lester  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

-----Original Message-----

**From:** [cflum@mcn.org](mailto:cflum@mcn.org) [<mailto:cflum@mcn.org>]  
**Sent:** Tuesday, September 25, 2012 1:42 PM  
**To:** Lester, Charles@Coastal  
**Subject:**

Dear Mr. Lester,

Please don't approve the PGand E plan to allow the sonic warfare on marine life. The plan is flawed and can only do harm that is unnecessary to the California ocean and the lives of the creatures therein.

I sincerely urge you to prevent this potential massive kill off and preserve marine life, The tourism and the lives of the wonderful sea life that are here, depend on the Commissions approval or denial.

Respectfully,

Char Flum  
310 N. Harold  
Fort Bragg, Calif. 95437

## **Teufel, Cassidy@Coastal**

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**From:** Marian Fricano <MFricano@scu.edu>  
**Sent:** Wednesday, September 26, 2012 9:30 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** PG&E seismic testing

Dear members of the California Coastal Commission,

I am writing to strongly protest any permit to PG&E to conduct seismic testing of the sea bottom just offshore of the facilities at Diablo Canyon and San Onofre nuclear power facilities in Avila Beach and San Clemente, respectively.

It is clearly established in existing geological surveys that they are built adjacent to significant earthquake fault zones. However, this horrible test that PG&E proposes would result in the likely death of hundreds of marine mammals including many Great Whales.

Even if the death of only one of these Great Whales would occur, THE VIOLENT CONCUSSIONS FROM AIR CANONS SHOULD NOT BE DONE. Who knows how many painful injuries and deaths would go unnoticed?

Please, for the sake of our oceans and our sealife:

DENY THE APPPLICATION OF PG&E TO CONDUCT SEISMIC TESTING.

Very Sincerely Yours,  
Marian Fricano  
4271 N 1st St., Spc. 12  
San Jose, CA 95134

Marian Fricano  
Head, Access Services  
Michel Orradre Library  
Santa Clara University  
Phone: (408) 554-5439  
email: [mfricano@scu.edu](mailto:mfricano@scu.edu)

"Customer Services: Where service excellence is an everyday occurrence."

## **Teufel, Cassidy@Coastal**

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**From:** Gail Gradowski <ggradowski@scu.edu>  
**Sent:** Wednesday, September 26, 2012 9:37 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Urgent Appeal

Dear members of the California Coastal Commission,

I am writing to strongly protest any permit to PG&E to conduct seismic testing of the sea bottom just offshore of the facilities at Diablo Canyon and San Onofre nuclear power facilities in Avila Beach and San Clemente, respectively.

It is clearly established in existing geological surveys that they are built adjacent to significant earthquake fault zones. However, this horrible test that PG&E proposes would result in the likely death of hundreds of marine mammals including many Great Whales.

Even if the death of only one of these Great Whales would occur, THE VIOLENT CONCUSSIONS FROM AIR CANONS SHOULD NOT BE DONE. Who knows how many painful injuries and deaths would go unnoticed?

Please, for the sake of our oceans and our sealife:

**DENY THE APPPLICATION OF PG&E TO CONDUCT SEISMIC TESTING.**

Very Sincerely Yours,

Gail Gradowski

## **Teufel, Cassidy@Coastal**

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**From:** Carolee Bird <cbird@scu.edu>  
**Sent:** Wednesday, September 26, 2012 10:55 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Fwd: Urgent request!

Sent from my iPad

Begin forwarded message:

>  
> Dear members of the California Coastal Commission,  
>  
> I am writing to strongly protest any permit to PG&E to conduct seismic testing of the sea bottom just offshore of the facilities at Diablo Canyon and San Onofre nuclear power facilities in Avila Beach and San Clemente, respectively.  
>  
> It is clearly established in existing geological surveys that they are built adjacent to significant earthquake fault zones. However, this horrible test that PG&E proposes would result in the likely death of hundreds of marine mammals including many Great Whales.  
>  
> Even if the death of only one of these Great Whales would occur, THE VIOLENT CONCUSSIONS FROM AIR CANONS SHOULD NOT BE DONE. Who knows how many painful injuries and deaths would go unnoticed?  
>  
> Please, for the sake of our oceans and our sealife:  
>  
> DENY THE APPLICATION OF PG&E TO CONDUCT SEISMIC TESTING.  
>  
> Very Sincerely Yours,  
Carolee Bird

## **Teufel, Cassidy@Coastal**

---

**From:** tillypat.mccain@gmail.com  
**Sent:** Wednesday, September 26, 2012 2:29 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** California Coastal Commission,

Dear members of the California Coastal Commission,

I am writing to strongly protest any permit to PG&E to conduct seismic testing of the sea bottom just offshore of the facilities at Diablo Canyon and San Onofre nuclear power facilities in Avila Beach and San Clemente, respectively.

It is clearly established in existing geological surveys that they are built adjacent to significant earthquake fault zones. However, this horrible test that PG&E proposes would result in the likely death of hundreds of marine mammals including many Great Whales.

Even if the death of only one of these Great Whales would occur, THE VIOLENT CONCUSSIONS FROM AIR CANONS SHOULD NOT BE DONE. Who knows how many painful injuries and deaths would go unnoticed?

Please, for the sake of our oceans and our sealife:

DENY THE APPPLICATION OF PG&E TO CONDUCT SEISMIC TESTING.

Very Sincerely Yours, Patricia J. McCain, Bryan, TX



**FREE Animations for your email** [Click Here!](#)

## **Teufel, Cassidy@Coastal**

---

**From:** Carl, Dan@Coastal  
**Sent:** Wednesday, September 26, 2012 2:38 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Please No Seismic Test off San Luis Obispo!!!

---

**From:** Nancy Evans [<mailto:nancygevens@yahoo.com>]  
**Sent:** Wednesday, September 26, 2012 2:33 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Please No Seismic Test off San Luis Obispo!!!

The marine web-of life will not survive the planned sonic tests that could be up to 260 decibels (dB). The Central Coastal California Seismic Imaging Project Environmental Impact Report states there will be many adverse impacts to commercial fishing and suggests fishing could end for an unknown length of time. Please hear our plea - the people of this area DO NOT WANT seismic testing to destroy our environment.

Sincerely,  
Nancy Evans  
2445 Tierra Drive  
Los Osos, CA93402

## **Teufel, Cassidy@Coastal**

---

**From:** Sierra Club <information@sierraclub.org> on behalf of Terrace Verdugo  
<sockmonkettv@aol.com>  
**Sent:** Friday, September 28, 2012 9:43 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Hiroshima blast was 240 decibels. How can you allow 130,000 blasts on our coasts

Sep 28, 2012

California Coastal Commission

Dear Commission,

You are suppose to be our heroes defending this. what is happening?

Permanent hearing damage and pain	130 decibels
A rocket launch	180
decibels	
Human death	200
Decibels	
The Hiroshima atomic bomb	240 decibels

These blasts will be at 250 decibels (stronger than Hiroshima) at a rate of every 20 seconds for 30 to 60 days. That is more that 130,000 atomic blasts to all our marine life on the California

Every where there has been air cannons blasts devastation has followed including Peru.

Sincerely,

Terrace Verdugo  
1945 Columbia St  
San Diego, CA 92101-2201

## **Teufel, Cassidy@Coastal**

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**From:** Shana Garrett <shana\_garrett@hotmail.com>  
**Sent:** Sunday, September 30, 2012 9:52 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** The seismic activity that doesnt need to happen!!!!

It doesnt

matter about the seismic activity. you are putting marine life in danger and if they cant eat, they will die.

They were here before the humans were. so why would want this to affect them. you ARE destroying I  
their ocean marine life. who gives about the seismic activity! you people need to get the  
point marine life was here before us. why destroy there ocean marine life with seismic boom?

I love the marine life animals if there one way i can stop it

i would. the only thing i can say or do is say "STOP IT" the seismic activity. the only reason you are  
doing it is to see the fault lines in  
the ocean. but honestly who cares about. if i would be able to be a marine biologist to stop and speak  
my mind i would.

IT JUST NOT RIGHT, THE MARINE ANIMAL HAVE THE RIGHT TO MIGRATE  
AND NOT HERE THE SONIC BOOM YOU WANT P&GE TO DO IN NOVEMBER.

i love

seeing the whales go through the central coast and if they stop and they die because of the noise that is  
not right.

i hope you understand and not let them do the seismic activity at all!!!

thanks

Read more here: <http://www.sanluisobispo.com/2012/09/29/2245703/more-than-2000-marine-mammals.html#storylink=cpy>

## **Teufel, Cassidy@Coastal**

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**From:** Joe Mangiardi <joemangiardi@yahoo.com>  
**Sent:** Monday, October 01, 2012 1:54 PM  
**To:** itp.goldstein@noaa.gov; Teufel, Cassidy@Coastal  
**Subject:** Diablo seismic studies

TO NMFS and the CCC:

Please allow me to state my opposition to the proposed seismic testing and to offer a solution. My qualifications include a BS in Marine Science, a MS in Wildlife and Fisheries Science, and as a resident of the Central Coast for the last 25 years. My comments are not intended to be in favor or against nuclear power generation, but are against the proposed seismic testing.

The conditions for the license renewal at PG&E Diablo Nuclear Power Plant are mandated by the NRC and include a requirement for seismic testing. The California Coastal Commission has also imposed a seismic testing mandate. I am sure PG&E personnel deeply regret having to inflict severe destruction to this ecosystem, and to their image in the community. Of course they will be left no choice but to pass the monetary cost onto their customers. The long lasting effects to the health and well being of the marine ecosystem and to those that depend on it are not clearly quantifiable and the final costs are not knowable.

There have been numerous studies on the deleterious effects of man made sound impacts on marine mammals, fishes and invertebrates. A 240 dB low frequency underwater burst has been recorded as 140 dB at a distance of 1000 miles! It is speculated that these tests will have "minimal impact", but there will INDEED be impact. It has been suggested to spread these studies out over two seasons. The reason is to see IF these impacts will be severe and not minimal which is a direct admission that these studies will be conducted without knowing what the impacts will be.

Here are several salient points:

1. PG&E's Diablo Plant has already been evaluated in terms of the worst case seismic scenario, what do we expect to find?
2. How accurate and informative can any evaluation actually be considering the immense subjectivity of any entity given this task?
3. Who will be given the evaluation task and in what time frame?
3. There is no person alive that can predict the time, magnitude and duration of any major seismic event.
4. These tests are in direct and continued violation of the state Department of Fish and Game MPA rules and regulations. (See page 51 of the regulations).
5. Nobody wants to bear the costs of these studies, whether financial recreational or ecological.

I propose that the NMFS, PG&E, and the state Department of Fish and Game petition the CCC and NRC to make a substitution to the seismic studies mandate requirements in their consideration of the license renewal process. That substitution may include:

Formation of an independent, international scientific review team to review the current fault, oceanographic data, structural engineering, emergency response plan and seismic information and make a formal report and recommendation to the NRC.

Thanks for your consideration.

## **Teufel, Cassidy@Coastal**

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**From:** Amber Barnard <amernbarnard@yahoo.com>  
**Sent:** Wednesday, October 03, 2012 7:43 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Seismic Testing...

Dear California Coastal Commissioners,

I am writing to ask that you would take a stand against this seismic testing on the California Central Coast. Everyone who knows about this is outraged. Besides the fact that we don't want it and we have to pay for it, we are sure that from this level of blasting in our sea it will inevitably harm our beautiful sea life! We have migrating whales right now that would be affected. We have endangered species including our California Sea Otters. Our sea lions, dolphin, our elephant seals, and pelicans... We have the most diverse and amazing sea life here. And that is what makes the Central Coast so great. What about our fishermen, surfers, divers? Our economy and tourism? I work at a hot spring resort and people come from all over the world to take in what we have here. It is a little slice of paradise, and it needs to be preserved for all to experience! This is a Marine protected area for a reason. Please, don't let PG&E do this here. We all know that Diablo Nuclear Power Plant is not safe being on multiple fault lines. This testing would do nothing for us. We need the plant shut down!!! Please do all you can to stop the Diablo Canyon Seismic testing...

Thank you,  
Amber Barnard  
California Central Coast Resident

## **Teufel, Cassidy@Coastal**

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**From:** Lester, Charles@Coastal  
**Sent:** Thursday, October 04, 2012 8:57 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: P G & E HI ENERGY SEISMIC PROJECT

**Charles Lester**  
Executive Director  
California Coastal Commission  
[www.coastal.ca.gov](http://www.coastal.ca.gov)  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
415-904-5202

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**From:** Ken Manzoni [<mailto:kenmanzoni@premiereyachtcharters.com>]  
**Sent:** Thursday, October 04, 2012 8:03 AM  
**To:** Lester, Charles@Coastal  
**Subject:** P G & E HI ENERGY SEISMIC PROJECT

Mr. Charles Lester,

I would like to express my concern over the proposed PG & E Seismic Project to potentially take place off of the Central Coast during the months of November and December.

With our company Adventure RIB Rides, (based out of San Diego, California) we have done whale and dolphin watching excursions year-round for the last eight years. We see Gray Whales beginning to pass by San Diego on their southward migration by late November and early December. We typically have steady and regular daily sightings of Gray Whales by mid to late December. The same whales we see passing by San Diego at this time of year, generally speaking would have passed by the Estero Bay area at least a few days to a week prior.

Where it is generally understood that the first of the Gray Whales to migrate south are pregnant females (following a more near coastal route); the potential harassment to these individuals and the potential negative impact on the Gray Whale population (not to mention the other species that would certainly be adversely effected) by the proposed PG & E Seismic Project would be detrimental.

My feeling is that alternative means of exploring the seismic potential of the sea floor should be considered before this quite hazardous process be approved.

Sincerely,

Ken Manzoni  
[www.PremiereYachtCharters.com](http://www.PremiereYachtCharters.com)  
Phone: (619)410-5222  
Fax: (800)530-7668

**Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Thursday, October 04, 2012 10:42 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** Amanda Canterbury [mailto:mail@change.org]  
**Sent:** Tuesday, October 02, 2012 3:03 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----

Sincerely,

It is absolutely nothing less than a massacre if this happens. We do not have the right to affect other species when there is an alternative method to use to gather the SAME data.

Amanda Canterbury  
Morro Bay, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

**Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Thursday, October 04, 2012 10:43 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** Dan Reddell [<mailto:mail@change.org>]  
**Sent:** Tuesday, October 02, 2012 1:37 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----  
Sincerely,

Dan Reddell  
Los Osos, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

**Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Thursday, October 04, 2012 10:43 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** Karen Archer-hutchison [<mailto:mail@change.org>]  
**Sent:** Monday, October 01, 2012 5:07 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----

Sincerely,

Because Christ said "as you do to the least among you, so you do to me". We must stop this sick immoral behavior now! No More Seismic Slaughter!

Karen Archer-hutchison  
lompoc, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

## **Teufel, Cassidy@Coastal**

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**From:** Jkimcrowder@aol.com  
**Sent:** Monday, October 08, 2012 1:24 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** seismic testing

It was encouraging to hear that PG&E shortened and postponed seismic testing on the Central Coast, but the new proposed time table places the testing into the season of migration of the pregnant gray whales and the pregnant elephant seals. The whales pass through this area on the way to Baja to give birth to calves, and the elephant seals are migrating to their birthing rookeries where they birth their pups on the Channel Islands and Piedras Blancas beaches. So the harm--stated in EIR reports as changes in migration, possible deafness, and even death--threatens not just one generation of these federally protected marine mammals, but two generations--the mothers and their unborn offspring.

Joan Crowder, Cambria

[jkimcrowder@aol.com](mailto:jkimcrowder@aol.com)  
(805) 927-0479  
2466 Leona Drive  
Cambria, CA 93428

**Teufel, Cassidy@Coastal**

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**From:** Alex Stevenson <alex@navywalk.com>  
**Sent:** Thursday, October 11, 2012 3:51 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Against Seismic Testing

Hello,

Please help stop testing at Diablo Canyon & San Onofre.

Sincerely  
Alex Stevenson

**Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Monday, October 15, 2012 4:13 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** David Gurney [mailto:mail@change.org]  
**Sent:** Sunday, October 14, 2012 12:55 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----

Sincerely,

David Gurney  
Fort Bragg, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

## **Teufel, Cassidy@Coastal**

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**From:** Angelena Masicampo <amasicampo@yahoo.com>  
**Sent:** Thursday, November 01, 2012 2:51 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Against Seismic Testing at Diablo Canyon-please help

Hey Cassidy,

My name is Angelena Masicampo and I was born and raised in San Luis Obispo, California. (I currently live at 312 Sandercock St in San Luis).

I, herby, petition against the seismic testing PG&E is trying to do at Diablo Canyon.

Please let me know what else I can do to show I am against this.

I want to do whatever I can to help this cause.

If you have any updates you can give me or any contact information you can give me so I can keep in the loop about where and how to protest, I would be very grateful.

Thank you for your time,  
Angelena

## Tagab, Clarita@Coastal

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**From:** Teufel, Cassidy@Coastal  
**Sent:** Thursday, November 01, 2012 4:09 PM  
**To:** Tagab, Clarita@Coastal  
**Subject:** FW: Please share with the Commissioners  
**Attachments:** Whale breaching Morro Rock.docx

-----Original Message-----

**From:** Julie Tacker [<mailto:julietacker@charter.net>]  
**Sent:** Friday, September 14, 2012 1:23 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Please share with the Commissioners

Dear Commissioners,

This photo was taken less than 1.4 miles from Morro Rock that the seismic testing will take place. The Environmental Assessment for the project admits "take" of one minke whale, two sperm whales, five dwarf sperm whales, 15 blue whales, 13 humpback whales, 25 fin whales, 97 California gray whales, a single short-finned pilot whale, three baird's beak, seven killer whales, eight striped dolphins, eight small beaked whales, 81 dall's porpoise, 82 long-beaked dolphins, 98 risso's dolphins, 114 northern right whale dolphins, 198 Pacific white-sided dolphins, 1,652 bottlenose dolphins and 1,834 short-beaked dolphins... 76 harbor seals, 1,062 California sea lions, and 1,485 southern sea otters, untold sea turtles of several varieties, numerous fish and bird species and the next generation sea life including nearly 4 million larva of all types. Even though the project claims to take place when whales are not migrating.

This humpback whale breaching in the photo may one of the 13 "taken" as part of the project unless you intervene. Please deny the permit sought by PG&E and send the Nuclear Regulatory Commission back to the drawing board for the information it seeks.

Thank you,  
Julie Tacker

EMERGENCY  
ESST



## **Teufel, Cassidy@Coastal**

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**From:** Connie Edwards <cedwards56@sbcglobal.net>  
**Sent:** Tuesday, October 30, 2012 9:31 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Seismic Testing Central Coast Diablo Canyon

Dear Mr. Teufel,

I am writing to you in order to ask you to reject the proposed PG&E Seismic Testing with Air-guns that will, in my estimation, cause great damage to the marine and human population in the testing area around Diablo Canyon Nuclear Plant.

PG&E already knows that there is significant potential for seismic activity and earthquakes to occur in this coastal location. I feel that there are ample scientific studies that have been done on the physical, and or physiological damage to all forms of Marine mammals and non-mammals. It has also been studied and assessed that there will be adverse behavioral effects to these creatures. I am also concerned that this unnecessary testing of a known dangerous earthquake fault area will result in 'long term 'damage to the economy of our fishing industry, tourist industry, and therefore the general well being of the entire Central Coast as well as the inland cities.

PG&E does not need any more earthquake data. They know that the potential for damage to Diablo Canyon is high, and any other testing is just a way to spend down some of their 81% increased earnings. I respectfully urge that the Coastal Commission denies the application of PG&E to do this destructive, unproductive and senseless seismic testing.

Sincerely,

Constance Edwards  
1957 Sherwood Dr.  
Cambria, CA 93428

## **Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Monday, October 29, 2012 9:46 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** Cara koppel [<mailto:mail@change.org>]  
**Sent:** Friday, October 26, 2012 11:06 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----  
Sincerely,

Cara koppel  
north hollywood, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

**Teufel, Cassidy@Coastal**

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**From:** Carl, Dan@Coastal  
**Sent:** Wednesday, October 24, 2012 5:05 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** FW: Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

**From:** Kyle Chidester [mailto:mail@change.org]  
**Sent:** Wednesday, October 24, 2012 3:26 PM  
**To:** Carl, Dan@Coastal  
**Subject:** Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

Greetings,

I just signed the following petition addressed to: California Coastal Commission.

-----  
Stop Seismic Testing at Diablo Canyon Nuclear Powerplant

The extremely large sound blasts of around 250 decibels to measure fault lines in 3D will destroy sea life. It will also negatively affect our Commercial Fishing Industry and waterfront businesses such as restaurants. Please stop the testing until a better system is in place.

-----

Sincerely,

Kyle Chidester  
San Francisco, California

Note: this email was sent as part of a petition started on Change.org, viewable at <http://www.change.org/petitions/california-coastal-commission-stop-seismic-testing-at-diablo-canyon-nuclear-powerplant>. To respond, [click here](#)

**Teufel, Cassidy@Coastal**

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**From:** Chuck & Debbie <surfblue@charter.net>  
**Sent:** Tuesday, October 23, 2012 11:55 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Notes From Earth: A Hubble Telescope Pointed Into the Ground | Earth Science | DISCOVER Magazine

<http://discovermagazine.com/2012/oct/21-hubble-telescope-pointed-into-the-ground>

## **Teufel, Cassidy@Coastal**

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**From:** Alycia Kiley <alyciakiley@gmail.com>  
**Sent:** Sunday, October 21, 2012 10:26 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** 3-D Acoustic Seismic Testing off Central Coast proposed by PG&E

Hello,

I am writing to express my grave concern over the effects on marine life of the proposed 3-D acoustic testing in the waters around Diablo Canyon nuclear power plant near Avila Beach.

The Central Coast of Cali is my home and home to one of the most diverse and healthy populations of sea mammals in the world. Migrating California gray whales, breeding elephant seals, California sea otters, sea lions, and harbor seals will be severely impacted by the proposed testing. Fish larvae, invertebrates, and rockfish will also be harmed or killed by this testing.

The highly endangered Western Gray Whale, of which there are only about 110 left in the world!! migrate through our coastal waters in December and have been left out of all documentation for this proposed project.

The local fishing industry will be severely impacted along with businesses, fish markets, local restaurants, and all who serve the thousands of tourists who make up a large part of the local economy. Data from other 3-D studies using similar technology show that it will take months to years to return a very delicate ecosystem back to normal, if ever.

This type of testing is completely unacceptable and there is no mitigation possible. As per AB1632, all existing studies of the area must be thoroughly reviewed and analyzed. Alternative methods that cause less harm to the environment and the creatures in it **MUST** be fully explored. It is the **RESPONSIBILITY** of your agency to follow the Precautionary Principal and to do no harm to the marine environment if alternatives are available. Please do not issue a permit for this devastating acoustic technology.

Thank you!

Sincerely,  
Alycia Kiley

## Teufel, Cassidy@Coastal

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**From:** Sierra Club <information@sierraclub.org> on behalf of Katherine Jain <jandkdj@yahoo.com>  
**Sent:** Tuesday, October 16, 2012 5:23 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Better Alternatives vs blunt blasting Please!!

Oct 16, 2012

California Coastal Commission

Dear Commission,

Please insist that PG&E move forward ONLY with alternative methods of study versus the current Central Coastal California Seismic Imaging Project. If the Project is approved as is, could wreak havoc on the stunning marine wildlife of the central coast. Please honor the Coastal Act which requires the protection of marine and biological resources as well as prevention of impacts to environmentally sensitive habitat areas (ESHA).

In keeping with the mandate of the California Coastal Act, I urge you to:

- Deny the project at this time, and work with the applicant to fully examine alternatives with the potential to greatly reduce impacts on the marine environment. This project should not move forward until alternative methods such as low-impact studies, better modeling, and technology currently in development have been fully examined as alternatives which may provide essential information on slip rates and earthquake risks that the proposed studies may not provide.

Alternatively, if the project does move forward, I urge you to take all necessary and available steps to:

- Avoid impacts where possible: Dr. Douglas Hamilton, a former PG&E geologist, testified before the California Public Utilities Commission that much of the offshore testing simply duplicates previous work.

Please fully examine the need to test in areas identified by Dr.

Hamilton and delete those that are redundant and unnecessary.

- Reduce impacts where possible: In those areas where offshore testing will take place, the Commission must make every effort to reduce its impacts on marine life, especially threatened and endangered marine mammals. We ask the Commission to deny the extension of the survey to the end of December, when gray whales are migrating through the central coast. We also hope you will fully consider alternative configurations and technologies that could reduce impact to coastal resources.

- Fully account and mitigate for damage to marine resources: The Environmental Impact Report understates the impacts to fisheries and invertebrates. We urge the Commission not to repeat the unfounded assumptions of the EIR and mandate rigorous long-term monitoring and mitigation measures for fish, invertebrates and habitat protection as a condition of any offshore seismic testing.

While I believe that we need to know the real seismic risk of to the Diablo Canyon Power Plant, I think PG&E needs to do this project right the first time.

Thank you for considering my comments.

Sincerely,

Katherine Jain  
5 Mount Tioga Ct  
San Rafael, CA 94903-1033

## **Teufel, Cassidy@Coastal**

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**From:** Erica Lann-Clark <lanntell@cruzio.com>  
**Sent:** Tuesday, October 16, 2012 11:11 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** seismic testing

Dear Coastal Commission,

You are entrusted with stewardship of the coastal waters and the life that lives in those waters. The seismic testing will cruelly kill marine mammals in large numbers. The bay is the ancestral home, calving place and nursery for many marine mammals. Remember: the health of the ocean and its inhabitants is entrusted to you!

Thank you for remembering your kindness toward all living creatures.

Sincerely,

Erica Lann-Clark

**Teufel, Cassidy@Coastal**

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**From:** Chelsea Mangold <chelseamangold@gmail.com>  
**Sent:** Tuesday, October 16, 2012 10:57 AM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** COAST Opposition

Coastal Commission,

I am in solidarity with the Barbareno Chumash Council (BCC) of Santa Barbara, Mothers for Peace, Citizens Opposting Acoustic Seismic Testing (COAST), all environmentalist groups, fishers and anyone else not mentioned here, and denounce seismic testing.

The reasons have been articulated at length by scientists, community members, tribal councils and others. The reasons need not be articulated any more. Stop the seismic testing!

Chelsea Mangold

**Teufel, Cassidy@Coastal**

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**From:** max <mlg5454@yahoo.com>  
**Sent:** Monday, October 15, 2012 11:16 PM  
**To:** Teufel, Cassidy@Coastal  
**Subject:** Stop Seismic Testing

Coastal Commission,

I am in solidarity with the Barbareno Chumash Council (BCC) of Santa Barbara, Mothers for Peace, Citizens Opposing Acoustic Seismic Testing (COAST), all environmentalist groups, fishers and anyone else not mentioned here, and denounce the seismic testing.

The reasons have been articulated at length by scientists, community members, tribal councils and others. The reasons need not be articulated any more. Stop the seismic testing!

California Citizen,  
Max Golding

Crystal Baker  
Member  
Coastal Band of the  
Chumash Nation  
P.O. Box 723  
Atascadero, CA. 93423  
Phone # (805) 466-8406  
Email: [lisimew@gmail.com](mailto:lisimew@gmail.com)

Cassidy Teufel,  
California Coastal Commission  
Energy, Ocean Resources and  
Federal Consistency Division,  
45 Fremont St., Suite 2000  
San Francisco, CA. 94105

Re: Three Dimensional Geophysical Testing PG&E on the Central Coast

I would like to bring forward that I have concerns that involve the 3D geophysical survey process that will cause negative impact of marine life, Chumash Cultural Resources, our spiritual connection with the sacred waters and the ancestors that live within. This goes against the United Nations Declaration on the Rights of Indigenous Peoples Article 24 (1) Indigenous Peoples has the right to their traditional medicines and to maintain their health practices, including the conservation their vital medicinal plants, animals and minerals. . The United Nations Declaration on the Rights of Indigenous Peoples was adopted by the United States on December 16, 2010 by President Obama. The process of 3D geophysical seismic testing would also go against California Endangered Species Act, Marine Life Protection and Act, and Endangered Species Act of 1973 and other state, local, and federal laws.

The rise of the sea level that has resulted in submerged Chumash Cultural Resource sites as well as the Chumash Cultural Resource Sites that have fallen into the ocean due to erosion. The process of laying nodes upon the sea floor will disturb the sensitivity of these sites and could even destroy them. The effects of using air guns, hydrophones, and geophones would contribute to Cymatic Wave Phenomena. It would cause the Chumash Cultural Sites to move, shift, and damage artifacts and human remains. There is no mechanism to protect these sites from this sort of project.

As mentioned above the loud noises in the water, the shaking of the earth, killing of animal life will contribute to ecocide that will ring through generations of the Chumash Peoples health, well-being, and spirituality by adding to the intergenerational trauma of genocide to the Indigenous Peoples. This would go against Native American Religious Freedom Act of protecting and preserving the rights of Native Americans Freedom of Religion and United Nations Declaration of Rights of Indigenous Peoples Article 25 Indigenous Peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters, and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Thank you for taking the time to read some of my concerns. I am looking forward to the California Coastal Commission to stand with the Chumash peoples as well as all the other groups opposing seismic testing and not permit this process to move forward.

Sincerely,  
Crystal Baker,  
Member  
Coastal Band  
of the  
Chumash Nation

Many past and present state, county and other elected officials and California Coastal Commissioners can be seen in this photograph. They include Sara Wan, Mary Schallenberger, Bonnie Neely, Steve Blank, Pat Kruer, Ben Hueso, Katcho Achadjian, Jerry Lenthall, Adam Hill, Bruce Gibson, Janice Peters, Betty Winholtz, Julie Tacker. They, and CCC staff and members of the public from San Luis Obispo County are gathered at the end of the journey that bonded them, having had experienced the most amazing show of nature imaginable.



**Photo credit to Neil Ferrell Bay News**

That is until a few years later, on Valentine's Day in 2011 Michael Fishbach, co-founder of The Great Whale Conservancy, encountered "Valentina" entangled in fishing net. She could not move and was fighting for survival. Please go to The Great Whale Conservancy's website and view the most heartwarming video of your day. After Michael and his family saved Valentina; the young humpback whale gave them a Valentine show to remember.



**Photo credit to Michael Fishbach**

This past August onlookers in Avila Bay's Port San Luis Harbor were dazzled recently by Valentina and her family "lunge feeding" on a bait ball near the pier. Humpbacks, pods of sea lions, and hundreds of sea birds delighted spectators and gave photographers the photo op of a lifetime during the week-long event.



Photo Credit to Bill Bouton

The humpback whale is a species of baleen whale. One of the larger rorqual species, adults range in length from 39–52 ft and weigh approximately 79,000 lbs. The humpback's distinctive body shape, with unusually long pectoral fins and a knobby head is an acrobatic animal, often breaching and slapping the water. Males produce a complex song, which lasts for 10 to 20 minutes and is repeated for hours at a time. The purpose of the song is not yet clear, although it appears to have a role in mating.

Apparently, strong northwest winds had caused an upwelling nutrient-rich cold waters from the sea bottom that had fueled blooms of phytoplankton that led to an explosion of krill, and that, in turn, led to vast numbers of sardines congregating and forming a huge bait ball near the Avila pier.

Humpback whales are filter feeders which suck in sea water to capture thousands of fish and krill in a single gulp. Humpback whales are generally curious about objects in their environments. Some individuals, referred to as "friendlies", approach whale-watching boats closely, often staying under or near the boat for many minutes. Because humpbacks are often easily approachable, curious, easily identifiable as individuals, and display many behaviors, they have become the mainstay of whale-watching tourism in many locations around the world. Nature's display was an instant economic boom for the County.



**Photo Credit to Maryann Avila**

Then, as the world was watching nature's display in Port San Luis, PG&E sent the Pacific Star and began low energy seismic testing. The bay went quiet. Then Valentina and her family, dolphins, sea lions, and even sea birds moved on.

Valentina's migratory return is set to begin just after this year's 250 decibel seismic testing of "Box 4" ends. Next year she'll be passing through on her way to the Sea of Cortez as tests begin again for Box 1 and 2. If she, her young son, or her mother isn't directly affected by the every 15 second, 24 hour-a-day, 7 day-a-week blasts into the sea; their porpoise, turtle, seal, sea lion and sea otter friends will be.

For **Valentina** and her family, we must **Stop the Diablo Canyon Seismic Testing**. To learn how join the **Stop the Diablo Canyon Seismic Testing** Facebook page.

**\*Based on a true story. Authored by activist Julie Tacker.**



**Photo credit to Michael Fishbach**

**Valentina** is like most Humpback Whales; she enjoys warm, low latitude tropical waters in the winter where she will breed and later give birth. In spring, summer and autumn she enjoys cooler, high latitude polar waters where she feeds. She and her family of Humpback Whales make mammoth journeys, nearly 3,000 miles, every year between their feeding and breeding sites. Humpbacks are capable of travelling at 5 mph but, during such a long journey, they average only 1 mph, resting and socializing along the way.

The Central Coast of California is a part-time home to the Central Coast Humpback Whale, which feeds in the nutrient-rich waters of Central California from May through October, before traveling south to Mainland Mexico. The Humpbacks are natural acrobats and tend to breach, or jump out of the water, more often than other whale species. They particularly enjoy showing off their tail as they dive down deep into the ocean in search of sardines, anchovies or krill. The show-stopping humpbacks can also often be seen slapping their flippers, spouting, sounding, tail-lobbing, lunge feeding, and spy-hopping.

This was the scene as Valentina's pregnant mother breached and flapped her flippers as she and her family put on a



**Photo credit to minicooper93402**

Date: 10/30/12

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's Proposal for Seismic Testing in the Central Coast

Dear California Coastal Commissioners:

I'm writing to express my opposition to PG&E's Proposal for Seismic Testing in Central Coast. This project could have dangerous impacts on ocean ecosystems and recreational ocean users. PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I'm deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

I'm also concerned that PG&E is disregarding the health and safety of ocean users. Their EIR clearly says the proposed activities would expose persons present in the water to harmful noise levels. And a recent PG&E map shows that dB levels could reach upward of 160 at some beaches. This is well over the threshold for human safety.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

Please deny this project. The Coastal Act was created to protect ocean resources and recreation. I believe this project does not conform to following sections of the Coastal Act:

\*\*Section 30220--Protection of certain water-oriented activities-- Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

\*\*Section 30224--Recreational boating use--Increased recreational boating use of coastal waters shall be encouraged...

\*\*Section 30230-- Marine resources; maintenance --Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

I urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Nicole Fischer Signature

Nicole Fischer Printed name

200 Nevada Ave Roseville CA Address  
95678

October 30 2012

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

Dear Mr. Teufel & Commissioners:

I want to register my strong objection to the proposal of PG&E to us extremely loud air gun blasts to explore earthquake faults. I believe that this will be devastating to our marine mammals, both those who live along the coast, and those that migrate through here annually.

The idea of using such disruptive devices, even on a short-term basis, is difficult to justify in an area inhabited by whales, dolphins, sea lions, otters and more is unacceptable. But the plan to blast the massive noise every few seconds round-the-clock seems like torture to me. It sounds like something used to break down prisoners to force them to divulge information.

Sound is vital to these animals; and subjecting them to such loud blasts of sound, which will travel for miles in the water, will cause disorientation at the least. It will likely cause deafness and ultimately death for many who have the misfortune to be within a few miles of the blasts. To consider this in any area where living beings reside is horrific; but to consider it within areas which have been designated as sanctuaries or protected areas is unimaginable.

Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Sincerely,

Signed: Nicole Fischer

Printed name: Nicole Fischer

Address: 200 Nevada Ave  
Roseville CA 95678

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

October 29 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Rosemary Verlich

Printed name: Rosemary Verlich

Address: 214 Hacienda Dr  
Scotts Valley Ca 95066

October 30 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

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CALIFORNIA  
COASTAL COMMISSION

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Candace Dekkert

Printed name: CANDACE S DEKKERT

Address: 3679 Fillmore St

San Francisco, CA

~~450~~ 94123

October \_\_\_ 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

RECEIVED  
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CALIFORNIA  
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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Gloria N Dekkert

Printed name: Gloria N. Dekkert

Address: 3679 Fillmore St

SF CA 94123

October 29 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Robin Holden

Printed name: Robin Holden

Address: 441 Manzanita Ave  
SC CA 95062

October 29 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Ueli Moody

Printed name: Ueli Moody

Address: 711 Hanover St -

Santa Cruz, CA 95062

October 30 2012

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Sincerely,

Signed: 

Printed name: Judy Fox

Address: 200 Nevada Ave  
Roseville CA 95678

October 30 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: 

Printed name: Rebecca Stein

Address: 180 Seaside Ct #10  
Aptos CA 95003

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

October 30 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

Dear Mr. Teufel & Commissioners:

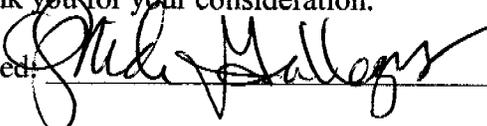
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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: 

Printed name: Linda Gallegos

Address: 4440 Diamond St #1  
Capitola Ca 95010

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

October 30 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Violet Puretz

Printed name: VIOLET PURETZ

Address: 153 Sausalito Ave

Apt 95003

October 30 2012

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Jennifer Nus

Printed name: Jennifer Nus

Address: 910 Tower Pl

Santa Cruz CA  
95062

October \_\_\_ 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

10-129/120V 01 2012  
RECEIVED  
CALIFORNIA  
COASTAL COMMISSION

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Signed: Stephanie Lynch

Printed name: STEPHANIE LYNCH

Address: 3162 McLENNAN DR  
APTOS, CA 95023

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

Date: October 29, 2012

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

Dear Coastal Commissioners:

Please accept this, my strong objection to the proposal of PG&E to conduct their seismic survey with extremely loud air gun blasts along our abundantly inhabited Central Coast. I believe that this will be devastating to our marine mammals, both those who live along the coast, and those that migrate through here annually.

There are alternatives to the air guns which are not as damaging to marine life. There is no justification for the use of this life-destroying method. I also believe that whatever new information may be learned from such exploration does not outweigh the harm to the ocean resources along our coast, or any other ocean setting.

Marine mammals rely on sound for reproduction, communication with family members, foraging for food, and general navigation. These loud blasts of sound will create waves that will travel for many miles – over 100 miles in some cases, as stated in the EIR conducted by PG&E. It will likely cause deafness and ultimately death for many animals who have the misfortune to be within a few miles of the blasts. To consider this in any area where living beings reside is horrific; but to consider it within areas which have been designated as sanctuaries or protected areas is unimaginable.

Please don't allow PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Sincerely, Signed: Laura Perron

Printed name: Laura Perron

Address: 7210 Viewpoint Rd  
Aptos CA 95003

October 30, 2012

RECEIVED  
NOV 01 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
Attn: Cassidy Teufel, Energy, Ocean Resources & Fed. Consistency Divn.  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Re: PG&E's planned seismic survey of the Central Coast

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Please deny the request for PG&E to proceed with this project. They must be forced to find alternatives for their ongoing business.

Thank you for your consideration.

Sincerely,

Signed: Ron Perron

Printed name: RON PERRON

Address: 7210 VIEWPOINT RD  
APTOS CA 95003

SIDNEY S. CHAPMAN

129 Seacliff Drive, Aptos, CA 95003-4439

sidnjon@cruzio.com

October 28, 2012

RECEIVED

NOV 01 2012

CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission

Attn: Cassidy Teufel, Energy, Ocean Resources & Fed.Consistency Divn.

45 Fremont Street, Suite 2000

San Francisco, CA 94105-2219

Re: PG&E Central Coast High Energy Seismic Survey

Dear Mr. Teufel and Commissioners:

After recently learning of the request for PG&E to be permitted to explore our Central Coast with high energy air guns which will emit extremely loud noises, I cannot imagine that this can be permitted within our sanctuary waters or anywhere along our coast which is frequented by many migratory ocean dwellers.

Much of the information submitted by PG&E and their research contractors is so technical as to be incomprehensible to me. However, I've read enough from there and other sources to cause me serious concerns about our ocean-dwelling wildlife, as follows:

1. The propagation paths estimated in PG&E's Appendix E seem to indicate that the sounds produced during the air gun firing may still be at a level of 160 decibels as far away as 3.86 miles, and 120 decibels as far away as 15 miles to 156 miles. (Some researchers estimate that whale vocalizations may travel as far as 500 miles.) According to a NOAA document, 120 decibels is the volume of a passenger jet taking off. Assumptions have been made that cetaceans can tolerate up to 180 decibels; however this does not take into account the cumulative effect of almost constant blasts 24/7 over a period of several to many days.
2. The plan to fire the array of guns at 15-20-second intervals, 24 hours per day for several days in a row will create no escape for ocean-dwellers who come within range of the sound, which can extend many miles, as mentioned above. This may result in disorientation, erratic behavior, inability to locate and capture food, fear responses causing mothers to abandon offspring, and physiological changes such as increased nitrogen in the blood and destruction of middle ear bones and various organs. Migratory animals may try to avoid the sound blasts by moving farther out to sea where there may be no food source, and where gray whales with calves, as well as seals and sea lions will be easy prey for the Orcas. (some information from Appendix H of the EIR, report from SMRU, Ltd., dated 3/14/12.)
3. PG&E's proposal calls for an "exclusion zone" (FEIR-Appendix D) to be monitored visually and by underwater acoustic devices to keep wildlife from being within close proximity to the air guns. There is no way that it will be possible to screen the area visually to prevent whales, dolphins, sea lions and other marine mammals (not to mention fish) from being within range of the noise, which will extend much farther than the boundaries of the exclusion zone. These animals may travel long

distances underwater, and show minimal presence above water for air intake, making it impossible to spot all animals traveling in the area.

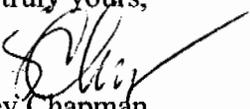
4. The additional acoustical monitoring proposal by PG&E (Appendix D, E.4.2) seems unlikely to be very effective since it will have to try to “hear” whale sounds over the loud noise of the air guns. And, what about those animals that don’t regularly communicate by sound, such as the marine turtles and sea otters?
5. The proposal includes huge arrays of equipment, with cables stretching out for miles (a total of 3,863 miles of lines), with lines streaming off of other lines, and weights keeping them several meters below the surface. (FEIR, Project Description, beginning Section 2.0) PG&E states in 5-21 of their Responses to Comments dated July 2012 that it is unlikely that a marine mammal would become entangled. But their plan in such an “unlikely event” would be to immediately contact NMFS (National Marine Fisheries) for instruction on handling the entangled mammal. The animal would surely die before any action could be expected to be directed. And, I fear that the likelihood of entanglement is far higher than PG&E projects. This seems to be in direct violation of the nature of marine sanctuaries.
6. The very areas that PG&E wants to cover with their sound barrage (478 square miles) will necessarily cause major disruption to the migration of whales who regularly visit our coast. And there is the added threat to the marine mammals that their food sources may be damaged, moved from their normal areas, or destroyed outright.
7. It seems clear to me that a significant risk to our beloved marine mammals, and possibly to our supply of fish for our own consumption, is unavoidable if we permit the use of this type of extreme disruption of the environment. Reduction of reproduction, especially among threatened or endangered species, is not something that we should consider as an acceptable risk.
8. It seems likely from many research sources that death from loud noise stress may not be immediate, as the animals may slowly starve to death once they have lost their ability to hear and thus to locate food. Further, many of the affected animals will not wash ashore at all, and therefore not be counted among the dead. (some information drawn from: “Deadly diving? Physiological and behavioural management of decompression stress in diving mammals” reviewed in a report downloaded from [rsps.royalsocietypublishing.org](http://rsps.royalsocietypublishing.org) February 28, 2012.)
9. Despite the statement of the Peruvian government to the contrary, a marine veterinarian who examined 30 dolphins and porpoises from the approximately 900 that washed ashore this spring has reported “visible fractures” in the middle ears of all 30 specimens. They also had bubbles in their lungs, all consistent with damage from anthropogenic activities such as sonar or seismic surveys. Such activities were occurring during the period immediately preceding the beginning of the dolphin die-off in Peru. (from May 28, 2012 *New York Times* Green blog article by David Jolley.)
10. Researchers are only beginning to obtain data regarding the vulnerability of marine mammals to decompression stress (the “bends”). A publication review in the Proceedings of the Royal Society, published online December 21, 2011 addresses the presence of nitrogen bubbles being released into the blood stream (as in the bends) as a result of sonar activity. The theory is that the assault of loud noise, especially over a prolonged period, may cause the release of the nitrogen, or that the noise stress may cause behavioral/diving changes leading to the nitrogen saturation.

11. There are alternatives! A “workshop on Alternative Technologies to Seismic Airgun Surveys... and Their Potential for Reducing Impacts on Marine Mammals” was held by Okeanos in Monterey, CA August 31 & September 1, 2009.
12. It appears that this type of survey is mainly used for oil & gas exploration. It would be good for PG&E to disclose their complete agenda for their requested survey. I would suggest that instead of spending their many millions of dollars on this survey, they spend the money on retrofitting the nuclear plant to withstand the strongest imaginable earthquake. No matter how well they map the faults, it will still not be possible to predict the magnitude of future earthquakes. It is best to prepare for the worst.

Our lives depend upon the continued health of our oceans. Our local economies depend upon the tourists who visit because of our natural beauty, including the wealth of marine life and activities. Most, if not all of us who live along the California Coast do so because we value the lifestyle and the wildlife here. It is vital that we protect our marine resources to maintain our quality of life, and that of the fish and mammals who live or migrate along our shores.

Thank you for your attention to these concerns.

Very truly yours,



Sidney Chapman

October 18, 2012

EMAIL: cassidy.teufel@coastal.ca.gov

Cassidy Teufel  
California Coastal Commission  
45 Fremont St., #2000  
San Francisco, CA 94105-2219

Re: Acoustic Seismic Testing  
California Central Coast

Dear Ms. Teufel,

I object to seismic testing to determine earthquake faults in the area of the Diablo Canyon Nuclear Plant off the Central Coast of California. Diablo was constructed over a known fault line, the danger disregarded, the plant built and opened in 1973.

A large seismic array can produce sounds with pressures higher than those of virtually any other man-made source besides explosives. The director of Cornell's Bioacoustics Research Program once described these surveys as possibly "the most severe acoustic insult to the marine environment."

Estimates of the numbers of whales, dolphins, porpoises, seals and sea otters that could be "taken" number in the thousands. Animals such as cetaceans might not be killed outright but suffer and die later from hearing loss or environmental impacts. It is feared that testing could seriously damage a small population of harbor porpoises in the Morro Bay area. This species is most sensitive to loud man-made sound and is the mammal most vulnerable to habitat abandonment and hearing loss.

Data from studies using similar technology of the area have not been thoroughly reviewed and alternative methods, such as low-impact studies, better modeling and technology in development been fully explored. Caution to protect marine mammals, the tourism industry, and the fishing industry must be the most important considerations.

Because if more faults are discovered, then what will be done? Diablo has already been retrofitted to withstand a 7 point earthquake. How will the dangerous tests make the plant any safer?

The U.S. needs to draw away from nuclear energy just as Japan announced it was doing after the disastrous Fukushima disaster. Plans should be in the works to phase out Diablo since it can never be safe enough to withstand a powerful earthquake, and then thousands of human lives will be lost, and the environment suffer for decades.

I strongly object to this waste of taxpayer money and, more so, to the damage it can do to our magnificent sea life.

Thank you for your consideration.

Maris Sidenstecker  
478 Argos Circle  
Watsonville, CA 95076

September 20, 2012

California Coastal Commission  
Central Coast District Office  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Re: PG&E proposed Central Coastal California Seismic Imaging Project

Dear Commissioners and Staff:

I would like to express my concern that PG&E's proposed Central Coastal California Seismic Imaging Project violates the California Coastal Act of 1976, in particular, multiple sections of Chapter 3, Article 4 "Marine Environment".

Having reviewed the EIR for this project, I am particularly concerned by the estimates of Level A take (Potential to Cause Physical Injury) And Level B take (Potential for Behavioral Disruption) as summarized in Tables 4.1 and 4.5 of Appendix H, the "Marine Mammal Technical Report". Because the language used in these appendices was so obscure, I prepared the attached notes regarding these tables to help other concerned people in my community interpret them, and have attached the notes to this letter for reference. Of greatest concern, of course, are the estimates presented in Table 4.1, which indicate that the proposed project has the potential to cause physical injury to a total of between 4 to 22 whales (6 species), 40 to 80 porpoises and dolphins (8 species), 7 to 15 harbor seals, and **501 to 782 California sea lions**. Several of these species are federally listed as threatened or endangered, in addition to being protected under the Marine Mammal Protection Act.

A surprising failing of the EIR is that it does not address potential impacts to gray whales. Since the project will continue through December, and gray whales migrate through this area in December, this is a major oversight.

The EIR is also inadequate in that it dismisses potential Level A impacts to sea otters with the assumption that no sea otters will experience Level A take because the authors believe that the sea otters' ability to raft up in kelp and lift their heads out of the water will protect them (p. 105 of Appendix H). Given that kelp beds occur in limited areas, and sea otters regularly and daily venture far away from the kelp beds while hunting for food, it is highly unrealistic to suppose that while testing is continuing every 15 seconds for weeks, the otters will never leave the kelp beds. Also, the authors provide no basis for the assumption that the otters would have an instinctive surfacing response to underwater acoustic disturbance.

The proposed mitigation measures are inadequate in that they rely heavily on human observation, which is limited by conditions of the weather and seas, and by daylight. Since the project plans to operate 24 hours a day, the mitigation measures proposed will inevitably fail to provide the protections to marine mammals that are needed, since there will undoubtedly be times when visibility is impaired by fog or rain, or when the seas are rough, or when night falls.

Crucially, PG&E needs to demonstrate that they have thoroughly investigated all other available current technologies for completing seismic studies, and assess the potential hazards to marine life presented by those methods. Per Chapter 5 of the EIR, they do not appear to have investigated more than a few options. There may well be technologies that can provide equivalent results with much more minimal disturbance.

I urge you to deny a permit for the proposed hi-intensity seismic testing project as currently proposed by PG&E. Thank you.

Sincerely,



J. Thomas  
551 Norwich Street  
Morro Bay CA 93442

Summary of Level A and Level B take of marine mammals  
as estimated by EIR for the PGE central coast offshore seismic imaging project:  
Tables 4.1 and 4.5 in Appendix H  
(J. Thomas 9/18/2012).

*First, let me provide the following caveat: I'm not a marine biologist, nor am I a statistician. I just stubbornly refused to give up trying to understand what these tables meant, at least as far as the following goes:*

The EIR summarizes the proposed project's "take" of marine mammals in two tables in Appendix H, the "Marine Mammal Technical Report":

Table 4.1 – Level A take estimates = Potential to cause physical injury (by implication, up to and including mortality)

Table 4.5 – Level B take estimates = Potential for behavioral disruption

These tables are difficult to understand because of the jargon used in the captions and headings. I went through the painful process of looking up definitions for the terms within the EIR, and there's a list of definitions attached here as the last page (page 5).

In addition, on page 2 here, I have excerpted the first key columns from Table 4.1, and provided explanations (to the best of my understanding) of the headings, using the old "circles and arrows" method – hopefully this is helpful.

Pages 3 and 4 provide the complete Tables 4.1 and 4.5. Basically, the columns to look at are the "Base" and "Potential" columns in the green sections. The estimated range of "take" for each species lies between the "Base" and "Potential" numbers.

That is, for Level A take as summarized in Table 4.1, in the green-colored "Injury SEL category", the proposed project has the potential to cause physical injury to a total of 4 to 22 whales, 40 to 80 porpoises and dolphins, 7 to 15 harbor seals, and 501 to 782 sea lions.

Similarly, Level B Take (potential for behavioral disruption) is summarized in Table 4.5. As with Table 4.1, the range of disruption for each marine mammal lies between the "Base" and "Potential" columns. As would be expected, the "behavioral disruption" numbers in Table 4.1 are much larger than the "physical injury" numbers in Table 4.5.

I hope this helps.

*Note re sea otters: Table 4.9 in Appendix H estimated 61 sea otters would experience Level B take, and that none would experience Level A take because the authors believe sea otters' ability to raft up in kelp and lift their heads out of the water will protect them (p. 105). The expectation that otters would be wise enough to remain in the vicinity of kelp and keep their heads above water during the testing seemed optimistic to me, but I defer to the marine mammalogists?*

Key columns from Final EIR's Appendix H "Marine Mammal Technical Report" **Table 4.1: Proposed Project - Level A takes of special status species calculated using Injury SEL and NMFS rms thresholds under three density scenarios.** For complete Table 4.1, see next page.

**Residual PBR = Residual Potential Biological Removal:** This term refers to "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." (EIR p.4.4-53)

**Injury SEL = Injury Sound Exposure Level:** This category shows estimates of numbers of animals that will experience injury or mortality (also referred to as Level A harassment), using three different methods called base, upper, and potential. From p. 4.4-52 of the FEIR: "The cumulative SEL (Sound Exposure Level) is described in this EIR as the *Injury SEL* when it is used to estimate Level A harassment, which addresses physical injury".

**Potential Injury SEL** is the most conservative (assumes greatest take) of the three methods (Base, Upper, and Potential) for estimating potential number of animals that might suffer injury or mortality (Level A Take).

Take method Density scenario	Residual PBR	Injury SEL		
		Base	Upper	Potential
<b>Species</b>				
<i>Fin whale</i>	15	2.5	3.6	8.9
<i>Humpback whale</i>	7.7	1.2	2.0	
<i>Blue whale</i>	2.1	0.9	1.5	
Minke whale	2	0.1	0.1	0.3
Short-beaked common dolphin	3,376	14.8	22.6	28.3
Long-beaked common dolphin	151	0.5	1.3	1.7
Small beaked whale species	25	<0.1	<0.1	<0.1
Harbor porpoise	15		51.6	51.6
Dall's porpoise	257	0.9	1.5	1.9
Pacific white-sided dolphin	178	1.6	2.4	3.0
Risso's dolphin	39	0.7	1.3	1.7
Northern right whale dolphin	43.2	0.6	0.8	1.0
Bottlenose dolphin – CA coastal	2.4	<0.1	<0.1	<0.1
<i>Sperm whale</i>	1.5	<0.1	<0.1	<0.1
Harbor seal	1,569	7.8	15.1	15.1
California sea lion	8,766	501.0	626.2	782.7



Table 4.1 **Proposed Project** (Boxes 1, 2, 3, 4) Level A takes of special status species calculated using Injury SEL and NMFS rms thresholds under three density scenarios. Red cells highlight high magnitude (>100%), orange highlight medium magnitude (50-100%) and yellow low magnitude (10-50%), based on percentage of Residual Potential Biological Removal (PBR). Endangered species are denoted in italics. Take estimates have been modified to take account of group-specific behavioral avoidance responses (range 90-99%) whereby animals avoid the area ensconced to the Level A threshold, as well as detection success of animals entering or within the exclusion zone using MMOs and PAM. NMFS Maximum takes are provided for the Base density scenario and represent multiple (repeat) takes. The ratio of NMFS Maximum to Minimum quantifies the 'intensity' of the survey within the Project footprint. Gray whales not included in table as densities expected to be zero during proposed survey period.

		Methodology to calculate number of Level A takes							
Take method	Residual PBR	Injury SEL			NMFS Minimum			NMFS Maximum	Ratio of NMFS Maximum/Minimum
		Base	Upper	Potential	Base	Upper	Potential		
Density scenario		Base	Upper	Potential	Base	Upper	Potential	Base	
Species									
<i>Fin whale</i>	15	2.5	3.6	8.9	0.5	0.8	1.9	5.2	9.9
<i>Humpback whale</i>	7.7	1.2	2.0		0.2	0.4	2.4	2.4	9.9
<i>Blue whale</i>	2.1	0.9	1.5		0.2	0.3	0.8	2.0	10.7
Minke whale	2	0.1	0.1	0.3	<0.1	<0.1	0.1	0.2	9.9
Short-beaked common dolphin	3,376	14.8	22.6	28.3	36.9	56.4	70.5	365.2	9.9
Long-beaked common dolphin	151	0.5	1.3	1.7	1.1	3.3	4.1	11.2	9.9
Small beaked whale species	25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	14.1
Harbor porpoise	15				3.3	7.5	7.5	35.3	10.7
Dall's porpoise	257	0.9	1.5	1.9	0.1	0.2	0.3	1.8	14.1
Pacific white-sided dolphin	178	1.6	2.4	3.0	3.9	6.0	7.5	38.7	9.9
Risso's dolphin	39	0.7	1.3	1.7	1.7	3.3	4.1	16.7	9.9
Northern right whale dolphin	43.2	0.6	0.8	1.0	1.3	1.9	2.4	18.8	14.1
Bottlenose dolphin – CA coastal	2.4	<0.1	<0.1	<0.1	0.6	0.9	1.1	2.7	4.4
<i>Sperm whale</i>	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	14.1
Harbor seal	1,569	7.8	15.1	15.1	1.7	3.3	3.3	5.6	3.3
California sea lion	8,766	501.0	626.2	782.7	109.9	137.4	171.7	361.7	3.3



Table 4.5 **Proposed Project** Level B takes of special status species calculated using Probabilistic Disturbance rms and NMFS rms thresholds under three density scenarios. Red cells highlight high magnitude (Listed species >2.5%, non-listed species >25%), orange highlight medium magnitude (Listed species 1.25-2.5%, non-listed species >15-25%) and yellow low magnitude (Listed species >1 individual, non-listed species 5-15%), based on percentage of minimum population estimate. Endangered species are denoted in italics. Take estimates have been modified to include group-specific behavioral avoidance responses whereby animals avoid the Level A threshold area. NMFS Maximum takes are provided for the Base density scenario and represent multiple (repeat) takes. The ratio of NMFS Maximum to Minimum quantifies the 'intensity' of the survey within the Project footprint. Gray whales not included in table as densities expected to be zero during proposed survey period.

Take method	Minimum population estimate	Methodology to calculate number of Level B takes						NMFS Maximum	Ratio of NMFS Maximum/Minimum
		Probabilistic Disturbance rms			NMFS Minimum				
		Base	Upper	Potential	Base	Upper	Potential		
Density scenario		Base	Upper	Potential	Base	Upper	Potential	Base	
Species									
<i>Fin whale</i>	2,624				14.4	20.8	51.9	484.4	33.7
<i>Humpback whale</i>	1,878	36.5			6.8	11.4		227.7	33.7
<i>Blue whale</i>	2,046	38.3			4.8	7.8	19.6	137.1	28.6
Minke whale	202	2.5	3.9	9.7	0.5	0.7	1.8	15.3	33.7
Short-beaked common dolphin	343,990	1047.1	1597.9	1997.4	1012.1	1544.5	1930.6	34116.8	33.7
Long-beaked common dolphin	17,127	32.2	93.8	117.2	31.1	90.6	113.3	1049.9	33.7
Small beaked whale species	2,498	50.9	78.8	98.4	2.9	4.4	5.6	61.9	21.6
Harbor porpoise	1,478				34.1		116.7	19379.5	26.4
Dall's porpoise	32,106	270.4	454.4	568.0	26.8	45.0	56.2	577.1	21.6
Pacific white-sided dolphin	21,406	111.0	169.8	212.2	107.3	164.1	205.1	3616.6	33.7
Risso's dolphin	4,913	47.8	93.4	116.8	46.2	90.3	112.9	1557.5	33.7
Northern right whale dolphin	6,019	44.3	63.5	79.4	35.6	51.0	63.8	784.0	22.0
Bottlenose dolphin - CA coastal	290	19.8	28.3	35.4	41.4	59.2		1838.4	44.4
<i>Sperm whale</i>	751	0.8	1.2	1.5	0.6	1.0	1.2	13.3	22.0
Harbor seal	26,667	48.7	94.5	94.5	38.8	75.2	75.2	1279.8	33.0
California sea lion	153,337	3137.4	3921.8	4902.3	2496.0	3120.0	3900.0	82392.8	33.0

Definitions found in the Seismic Imaging Project final EIR for the terms used in the Table 4.1 and 4.5:

**PBR** = Potential Biological Removal - ...According to the MMPA, PBR is defined as, "...the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." PBR was initially intended to serve as an upper limit guideline for fishery-related mortality for each species, and is used here as a similar means of considering human-caused mortality. The term "residual PBR" takes into account other known sources of human-induced mortality..... (from different section): To assess the magnitude of the Level A effects on biological resources relative to the population, we however used Potential Biological Removal (PBR) as the most appropriate metric to evaluate the relevance of potential mortality/injury effects. This tacitly assumes, as a worst case approach, that all Level A takes may cause the eventual equivalent of mortality (whether indirectly or directly) of an individual.

**SEL** = Sound Exposure Level

#### **Take" and "Harassment" Under the MMPA Take**

As defined under the MMPA, to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect."

#### **Harassment**

Harassment is defined under the MMPA as any act of pursuit, torment, or annoyance that:

- **(Level A Harassment)** has the potential to injure a marine mammal or marine mammal stock in the wild; or,
- **(Level B Harassment)** has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

**NMFS Minimum and Maximum Takes** = (from page 4.4-76):

"As presented in Subsection 4.4.1 and described in detail in the Marine Mammal Technical Report attached as Appendix H, Level A acoustic takes were calculated using two different sets of thresholds, NMFS *Minimum* and *Maximum*, and *Injury SEL*.

"The numbers presented in Table 4.4-14 for the NMFS *Minimum* (Individual Exposure) threshold exposures represent an estimate of the minimum number of individual takes; however, do not take into account potential overlap in the area that may be ensounded (exposed to survey noise) during the seismic survey. For example, as shown in Figure 2.5-8, the proposed seismic lines run parallel to each other in close proximity (1,312 feet [400 m]); as a result, there are areas where radii overlap (often multiple times). Because of this overlap, an individual mammal, if it remained in the same place, may theoretically be exposed to noise numerous times during the survey, resulting in multiple takes. The NMFS *Maximum* threshold exposures include the areas of overlap when estimating the take. The ratio of *Minimum* and *Maximum* exposures, as an indicator of the intensity of the total survey exposure, are also shown in Table 4.4-14.

"For both Level A acoustic take criteria, three scenarios for population density have been modeled (Base, Upper, and Potential) and are reported in Appendix H. The density scenarios modeled are as follows:

Base – mean densities;

Upper – mean densities weighted by 90 percent confidence limits or one Standard Deviation; and

Potential – density prediction that factors in potential density variability by considering a conservative "turnover" rate (i.e., the rate at which individual animals of a certain species may move in and out of an area), as well as a correction factor for humpback whales. The humpback whale correction factor is based on expert comments received on the SERDP-SDSS Model density 16 estimates.

(...continues with discussion of underlying assumptions)

September 18, 2012

Re: Seismic Testing/PG&E/Diablo Canyon

Dear Commissioners,

Thank you for this opportunity to comment on the proposed Seismic Testing by PG&E (Project).

As I set out to cite Chapter and Verse of Chapter 3, the Coastal Resources policies of the Coastal Act to inform you of the Projects inconsistencies and how it violates the Act, it became clear I didn't have to note any one in citation in particular, the Project violates them all.

By now you are well aware of the resources identified within the project area, but what you will not find in the documentation is the fact that the sound generated by the air-gun blasts will be heard underwater inside the Morro Bay National Estuary. (This statement is based on a telephone conversation with CCC, Marine Biologist, Cassidy Teufel, on September 13, 2012). The estuary is nature's incubator; its life forms are extremely fragile. The organizations who generally speak up for the estuary have not engaged in an organized opposition to the project, due in part, to the documentation's omission of this fact.

Alternatives exist; I have attached an email to a neighbor of mine from Jeanne Hardebeck, PhD., USGS, and her biography, wherein she suggests a viable alternative to air-gun blasting of the entire fragile central coastline. In it she says, "The fault can also be seen in magnetic data collected by towing a magnetometer behind a ship" and "seismic surveys are only one of many ways to image faults."

Additionally, I wanted to remind those of you who remain on the Commission (see photo) of the magnificent dinner cruise on July 12, 2007. The Commission, local dignitaries and a select few members of the public motored out of Morro Bay on the glassiest day anyone can remember. Jeff Edwards and I were fortunate enough to have accompanied your Commission on this boat ride where nature gave us the show of a lifetime. Beautiful Humpback Whales breached and blew their spray very near the boat, delighting all aboard.

Deny this permit, the risk outweighs any benefit.

Thank you for your attention to the very important matter.

Julie Tacker, PO BOX 6070, Los Osos, CA 93412

julietacker@charter.net

Coastal Commission:  
September 17, 2012

This declaration is in regards to the plans by PG&E to conduct detrimental seismic testing off the coast of Morro Bay in the fall of 2012. My name is Maura Sullivan. I am a member of the CBCN (Coastal Band of the Chumash Nation) encompassing Santa Barbara and Ventura Counties. I am a paddler in our traditional redwood plank seafaring vessel- the tomol. Before becoming a paddler I was involved in fishing and boating with my family all along the coast of southern California. I have had the pleasure and honor of paddling in Avila bay as well as across the Santa Barbara channel as part of our annual tomol crossing. I am a 25 year old U.C. Berkeley student currently studying Native American Studies. Currently I am away from my home of Ventura, CA but I am connected with my tribal community through ongoing gatherings and other communication.

Recently at our annual gathering at Limuw (Santa Cruz Island) it was brought to our attention that this issue with the seismic decibel testing off the coast of Morro Bay will cause unknown damages to our marine animal habitats. This is absolutely intolerable. PG&E attempts to procure this testing without consulting our Native Community.

This permit; ([http://www.nmfs.noaa.gov/pr/pdfs/permits/pge\\_filed\\_federalregister.pdf](http://www.nmfs.noaa.gov/pr/pdfs/permits/pge_filed_federalregister.pdf)) claims that the damages to the dolphins, whales, and other creatures is a necessary loss for the mapping of the earthquake fault. Many of the population trends (pg. 26-28 of that report) have been labeled as "unable to determine" or "no information available." This lack of knowledge on some of the major creatures of that report shows that PG&E and their researchers are unaware of the losses to our precious animal communities.

The dolphins and whales are our relatives. When crossing the Santa Barbara channel for our annual Tomol crossing we encounter these blessed creatures and immediately our community erupts in applause and songs and prayers of gratitude. The animals are more than creatures with whom we cohabitate. These spirits are our guides and our caretakers. They teach us how to move through our lives in a fluid and graceful way. We cannot live without them. And our community is organizing in order to be their caretakers on an issue in which they have no say and they have no rights. The U.S. Endangered Species Act of 1973, as cited by the permit, should protect them in such cases.

The deserted future that PG&E proposes to leave us with in the wake of these testings can only be speculated in comparison to the recent testings off the coast of Peru, (<http://www.globalpost.com/dispatch/news/regions/americas/120417/peru-massive-dolphin-deaths>). The hierarchy of species and interests is clear; the motivations are transparent. Our fragile ocean ecosystem is ONCE AGAIN being pushed aside in the interests of corporate and capitalist progress. Same old story.

Article 8.2 part b (pg. 5) of the recent UNDRIP (United Nations Declaration of the Rights of Indigenous Peoples) ([http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf)) states that:

2. States shall provide effective mechanisms for prevention of, and redress for:
  - (b) Any action which has the aim or effect of dispossessing them of their lands, territories or resources.

This letter is in direct support of the NCTC and the Northern Chumash peoples' rights to protect their environment and the sea creatures as a cultural resource. This is summarized in article 26 of the UNDRIP:

Article 26

1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.

My concern in this matter is due to my studies within Native American Studies and my heritage as a Chumash woman. I am all too familiar with "progress," "manifest destiny," and other notions of entitlement. The fact of the matter is, this invasive seismic testing will not only affect the immediate area surrounding the waters, it will affect far reaching spaces within the ocean. The brash and ignorant actions for the sake of private corporate interests is just another in a series of transgressions against our community.

The mapping of this fault is already adequate. The recorded information on this earthquake fault can be used to do the improvements that PG&E is seeking to do on their facility at Diablo Canyon without doing this dangerous testing. As a community we propose that you use the existing data in order to work in harmony with the environment in which the facility is located.

We will pray and we will continue to live in a good way as we have for thousands of years. We only hope and pray that you too will consider the next seven generations that will be affected by the actions of this testing. Please feel free to contact me.

Maura M. Sullivan  
Chumash Maritime Association, paddler  
U.C. Berkeley Native American Studies, 2012  
CBCN (Coastal Band of the Chumash Nation)  
363 Wesleyan Ave.  
Ventura, CA 93003  
[sycamaura@gmail.com](mailto:sycamaura@gmail.com)

Oct 29 2012

To the members of the CA Coastal  
Commission:

RECEIVED  
OCT 31 2012  
CALIFORNIA  
COASTAL COMMISSION

I'm writing to express my opposition  
to PG&E's planned sonic testing around  
Diablo Canyon nuclear plant and San  
Onofre.

These high decibal sonic blasts  
will cause unacceptable harm to the  
ocean life, and will not be used in any  
meaningful way when analyzed.

Please do NOT let this seismic  
sonar testing in the Pacific occur.

Thank You

Merle Fry  
P.O. Box 7691  
Los Osos CA 93412

RECEIVED 28/11  
OCT 31 2012  
CALIFORNIA  
COASTAL COMMISSION

Dear California Coastal Commission,

Please help stop the ocean blasting in SLO County on the central coast. It will violate local tribal rights, halt aquatic recreational activities. It will severely impact our tourist based economy & violate numerous state & federal laws. This will cost taxpayers <sup>of</sup> 100 million dollars & will not have desirable outcomes.

Please Help.

P.S. I have lived in SLO County for over 40 years and I find it to be the most beautiful place in the world. Let's keep it safe & thriving.

Thank you for your time

Vicki Ann Richardson

Vicki A. Richardson

**Central Coastal Commission**

**October 26, 2012**

**Central Coast District Office**

**725 Front Street**

**Suite 300**

**Santa Cruz, CA 95060-4508**

**RECEIVED**

OCT 29 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

**Attn: Dan Carl, Deputy Director**

Dear Sir,

Please accept these letters expressing our strong opposition to PG&E's proposed seismic testing in the central coast. These were gathered from my neighbors in Shell Beach, CA.

Everyone I have talked with in the last several months is firmly opposed to this testing.

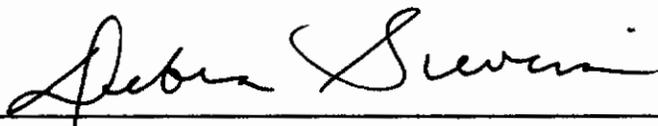
We trust that as our Coastal Commission, you will protect our waters and the abundant and precious marine life that live next to us.

Please deny PG&E the right to conduct this testing and anything else that will cause harm to our natural environment and animals.

Thank-you for your consideration.

Sincerely,

Debra Sievers, California native and ocean enthusiast

 10/26/2012

RECEIVED

OCT 29 2012

Dear California Coastal Commissioners:

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

I'm writing to express my opposition to PG&E's Proposal for Seismic Testing in Central Coast.

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I'm deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

I'm also concerned that PG&E is disregarding the health and safety of oce of 160 at some beaches. This is well over the threshold for human safety.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

Please deny this project. The Coastal Act was created to protect ocean resources and recreation. We believe this project does not conform to following sections of the Coastal Act:

\*\*Section 30220--Protection of certain water-oriented activities.

\*\*Section 30224--Recreational boating use

\*\*Section 30230-- Marine resources; maintenance

\*\*Section 30210-- Access; recreational opportunities.

We urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely, Debra Sievers Date: 10/25/2012

Sign and date above. Print name and address here:

Debra Sievers  
342 Morro Ave  
Shell Beach, CA 93449

**40 individuals had submitted this letter on 10/29/12 together with Debra Siever's opposition letter.**

Dear California Coastal Commissioners:

COASTAL COMMISSION  
CENTRAL COAST AREA

**I'm writing to express my opposition to PG&E's Proposal for Seismic Testing in Central Coast.**

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

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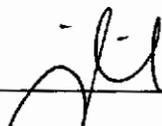
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- \*\*Section 30220--Protection of certain water-oriented activities.
- \*\*Section 30224--Recreational boating use
- \*\*Section 30230-- Marine resources; maintenance
- \*\*Section 30210-- Access; recreational opportunities.

We urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,



Date: 10/24/12

Sign and date above. Print name and address here:

Wendy Eidson  
1170 Buchm St.  
San Luis Obispo, CA 93401

Dear Coastal Commission:-

I am writing to express my concern about the proposed seismic testing. We are told that this is to increase our safety. However PB+E has no commitment to do anything as a result of these studies. They are simply to increase information. PB+E has a track record of ignoring unwelcome information.

Absent such a commitment this is just a show of improved safety and one which is likely to cause suffering and possible death to marine mammals who use echo-location. Many of these are endangered and all of them are precious.

Please do not allow PB+E to go ahead. Thank you  
Rev. C. J. A. Hill

RECEIVED

OCT 30 2012

CALIFORNIA  
COASTAL COMMISSION

October 25, 2012

California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

Honorable Commissioners,

I am writing to you today to express my strong opposition to PG&E's proposed seismic testing in the waters off of the Diablo Canyon nuclear power plant. And when I say 'strong opposition,' let me be clear – the proposed project would be an abomination. Nothing less.

I understand that we are living in a post-Fukushima world. I recognize that there is more to learn concerning the fault lines near the Diablo plant. I am aware that state law mandates that PG&E do extensive seismic studies. I know all of this. And yet, I still oppose the project. Why?

While there are a number of reasons, let me start with the 'worst case scenario.' I am sure you are familiar with this argument, but nonetheless, it seems like a good place to start.

The Environmental Impact Report on the project quantified its potential 'take.' 'Take' means, as I understand it, 'losses' ... whatever the testing could potentially 'harass, harm, or kill.' Those are the words used to qualify 'take' – harass, harm, or kill. 'Kill' is easy enough to understand. Anything close enough to the blasts will be killed on the spot, leaving carcasses in our water and on our beaches. 'Harm' doesn't sound quite as serious, until you get into the details. David Gurney, Vice Chair of the Ocean Protection Coalition of Mendocino County, has attempted to elucidate the risks. "Each of these underwater blasts will be at the volume level of a shock wave, that will instantly deafen, maim, and possibly kill everything unfortunate enough to be in its path ... For a human, your ears, or what's left of your ears, would probably never stop ringing. The consequences of experiencing this level of sound can only be presumed to be immediate and permanent deafness – if not worse. For sea life, beyond just broken eardrums, the transfer of low-frequency shock waves from water-air-water causes hemorrhaging of lungs and air-sacks." A representative of Greenpeace has stated, "Dolphins' eyes will burst and bleed. Whales will become confused as their eardrums rupture from the pressure. The lucky ones ... are the smaller marine life forms that will simply be killed immediately." Those creatures unable to see, hear, float... for them, these tests would mean painful, lingering deaths. That is what 'harm' means. Even 'harass,' the most innocent sounding of the three, becomes horrific when you get into the details. Terrified, animals could split from their pods. Babies could be separated from their mothers. Both of these situations would likely prove to be death sentences for the creatures involved.

So what stands to be harassed, harmed, and/or killed? The Environmental Impact Report puts the potential toll at 15 Blue Whales, 13 Humpback Whales, 25 Fin Whales, 1 Minke Whale, 2 Sperm Whales, 97 California Gray Whales, 1 Short-Finned Pilot Whale, 3 Baird's Beak Whales, 7 Killer Whales, 8 Striped Dolphins, 8 Small Beaked Whales, 81 Dall's Porpoise, 82 Long-Beaked Dolphins, 98 Risso's Dolphins, 114 Northern Right Whale Dolphins, 198 Pacific White-Sided Dolphins, 1,062 Bottlenose Dolphins, 1,834 Short-Beaked Dolphins, 76 Harbor Seals, 1,062 California Sea Lions, and 1,485 Southern Sea Otters, along with innumerable sea turtles, fish, and birds, and the entire next generation of sea life, including nearly 4 million larvae. Thousands upon thousands of animals tortured to death.

PG&E has pointed out that in other areas where similar tests have been done, monitors did not 'observe harm' to whales. But mortally wounded whales sink into the ocean, making 'observing harm' very difficult indeed. PG&E has also said that it will do what it can to mitigate harmful side effects. But no matter how hard they try, in projects of this magnitude, human error is a certainty. There will be side effects. There will be harm. You cannot cruise through marine preserves, blasting twenty 250-decibel 'air cannons' more or less continuously for 42 days and expect that it won't affect something. Nothing exists in isolation. Seismic blasts least of all.

But let's assume for the moment that PG&E can do some of what it is promising, and that it manages to avoid the 'worst case scenario.' Perhaps the tests will only cause 50% of the previously mentioned destruction. Perhaps only 25%. What then?

The Northern Chumash Tribal Council, in a statement opposing the project, referenced its "destruction of the warp and weave of the basket of life." But what does that actually mean? "The warp and weave of the basket of life?" Essentially, it means that our planet's natural systems are delicate, interdependent and unbelievably complex – developed over millennia – and that when we mess with them, we are tinkering in things we do not fully understand. Moreover, and most importantly, our lack of understanding makes it hard to accurately predict the full ramifications of our actions.

This idea is conveyed particularly clearly in David Suzuki's *The Legacy* – a book that could easily be viewed as the *Common Sense* of the environmental movement – and is given especially elegant expression in Suzuki's discussion of salmon.

That salmon are dependent upon the temperate rainforest in whose rivers they are born is common knowledge. They need the shade from the trees to keep the rivers cool, and the roots of the trees to hold the banks in place. They need these things as juveniles, and they need them again when they return as adults, after a life spent at sea, to breed. What is less widely understood is that the forest needs the salmon just as much as the salmon need the forest. Suzuki explains why this is the case. He points out the vitally important fact that the salmon accumulate nitrogen in their bodies while they are at sea, and that they bring this nitrogen back with them when they return to breed. The nitrogen is then passed along to the predators that catch the fish – the bears, wolves, and eagles of the area – who go on their merry way after eating the salmon, excreting nitrogen-rich fertilizer all over

the forest. The salmon are thus the source of the forest's nitrogen, and bears are the 'vectors' that carry it. But the system gets even more complex. The bears, as it turns out, eat only the best part of the fish and leave the rest behind on the forest floor. Many creatures then consume the leftovers, including, significantly, flies. The flies lay their eggs in the carcasses, and the larvae, once they hatch, feed on them. Nitrogen from the ocean is thus passed on to the larvae, which pupate over the winter. Come spring, trillions of nitrogen-rich flies are born – just in time for the annual migration of South American birds to pass through on their way to their nesting grounds in the Arctic. So, the nitrogen is passed from the salmon to the bears, from the bears to the forest, from the bears' leftovers to the flies, and from the flies to the birds. And the birds carry it on with them, depositing their own droppings and feeding their own set of predators as they continue to travel north. This beautiful, delicate system thus not only links our land with our oceans, it also connects South America to the northern hemisphere – and all of this, from salmon.

I offer this anecdote to help illustrate the complexity of the systems we are messing with. We as humans, we tend to take these interconnected systems, divvy them up, and place the resulting 'pieces' under the control of different bureaucracies. (For example, in the system mentioned above... the salmon would perhaps fall under the purview of the Canadian Minister of Fisheries and Oceans, the trees, the Minister of Forestry, the bears, the Minister of the Environment. The rivers would maybe be managed by the Department of Agriculture, and the rocks and mountains by the Ministry of Energy and Mines.) But that is not how nature works. One thing impacts the next, and should a single card fall, the whole house is at risk. THAT is the meaning of "the warp and weave of the basket of life." That is what is at stake. Because make no mistake, the animals that the PG&E tests will endanger are players in complex systems of their own. So, even if PG&E manages to kill slightly fewer animals than the utterly horrifying number put forth by the Environmental Impact Report, the impact could still be massive. The ultimate point being, we do not know – we cannot know – the full extent of the mess we would be making should PG&E's tests go forward.

So, with all of that in mind – all of the massive loss that could be incurred as a result of the project – the next question is, what would be the gain? Presumably, to offset the loss, the gain should be equally massive. But that does not seem to be the case. The Nuclear Regulatory Commission has already concluded that the Shoreline Fault poses no threat to Diablo, and Natural Resources Defense Council has concluded that seismic testing would "provide only marginal additional informational information that will not affect the safety of the Diablo plant." So, for all that devastation, we would be gaining only 'marginal' information? Moreover, the value of any information is dependent upon how one uses it. In all seriousness, if the project goes forward, what would we do with the resulting data? Is PG&E going to shut down the plant, should the fault lines prove more dangerous than expected? Probably not. Would they increase safety precautions? Maybe. But shouldn't a nuclear power plant sitting on multiple fault lines have top of the line safety measures anyway? We already know that scientists' best guesses can be proved wrong – Fukushima was hit by a 9.0 magnitude quake when the scientists did not believe that the fault line would produce anything stronger than 8.0. Should the PG&E tests go ahead,

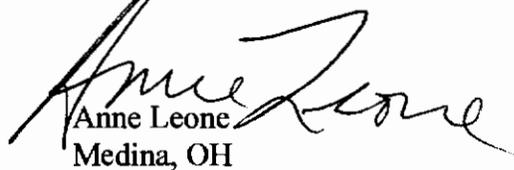
and prove the faults less threatening than currently presumed, would it really be wise to sit back, relax, and accept less than ideal safety precautions? When it comes to nuclear power, shouldn't we be prepared for the worst anyway? Let's take the \$64 million dollars that would be spent on the seismic tests, and put it towards plant upgrades instead.

In the end, we are talking about massive loss for minimal gain. We are talking about risking the lives of thousands of animals. We are talking about torture. We are talking about endangering the ecosystems upon which we, and so many others depend. We are talking about a lot of things, and it is my hope that the California Coastal Commission is willing to listen.

Concern is not limited to Californians. I am from a town in New Jersey called Haddonfield, located just a few miles from Philadelphia. I studied at Northwestern University in Chicago. And today I write to you from Ohio. Everyone I speak to, everyone who has heard of this project, finds it repugnant. Concern over this is nation wide.

These tests do not have to go forward. They are not, as Amanda Wallner of Sierra Club California said, "the best way or the only way to determine seismic risks." We can, and must, do better – by ourselves, and by the earth that harbors us.

Sincerely,



Anne Leone  
Medina, OH

RECEIVED

OCT 30 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

October 25, 2012

Dear California Coastal Commissioners:

I'm writing to express my opposition to PG&E's Proposal for Seismic Testing in Central Coast.

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I'm deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

I'm also concerned that PG&E is disregarding the health and safety of ocean users. Their EIR clearly says the proposed activities would expose persons present in the water to harmful noise levels. And a recent PG&E map shows that dB levels could reach upward of 160 at some beaches. This is well over the threshold for human safety.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

Please deny this project. The Coastal Act was created to protect ocean resources and recreation. We believe this project does not conform to following sections of the Coastal Act:

**\*\*Section 30220--Protection of certain water-oriented activities--** Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

**\*\*Section 30224--Recreational boating use--**Increased recreational boating use of coastal waters shall be encouraged...

**\*\*Section 30230-- Marine resources; maintenance**

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

**\*\*Section 30210-- Access; recreational opportunities; posting**

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...

We urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

Shelley Wilson  
2161 Green St.  
Cambria, Ca.  
93428

Dear California Coastal Commission:

I am writing to express my deep concern over the effects on marine life of the proposed 3-D acoustic testing in the waters around Diablo Canyon nuclear power plant near Avila Beach, CA.

The Central Coast of California is home to one of the most diverse healthy populations of sea mammals in the world. Migrating gray whales, breeding elephant seals, California sea otters, California sea lions and harbor seals will be severely impacted by the proposed testing. Fish larvae, invertebrates, and rockfish will also be harmed or killed by this testing. The local fishing industry will be severely impacted, along with retail businesses, fish markets, local restaurants and all who serve the thousands of tourists who make up a large part of the local economy.

Data from other 3-D studies using similar technology show that it will take years to return a very delicate ecosystem back to normal, if ever.

This project should not move forward until all existing studies of the area have been thoroughly reviewed and alternative methods such as low-impact studies, better modeling, and technology currently in development have been fully explored.

It is the responsibility of your agency to follow the Precautionary Principle and to do no harm to the marine environment if alternatives are available. Do not issue a permit for this devastating acoustic technology without first exploring all other options.

Thank you for considering my comments.

10/24/12

RE: 3-D ACOUSTIC SEISMIC TESTING OFF THE CENTRAL COAST

I AM A LIFELONG CITIZEN OF SAN LUIS OBISPO COUNTY & EVER SINCE I WAS A YOUNG GIRL I FELT A DEEP SENSE OF CONNECTION WITH THE OCEAN. AS AN ADULT, I NOW SURF THE WATERS & RETURN TO IT'S EDGES TO QUIET MY MIND & RECONNECT.

PG&E IS PROPOSING A COMPLETELY ILLEGAL 3-D STUDY THAT COULD EFFECTIVELY DESTROY THE MIRACULOUS FLORA & FAUNA DIVERSITY OF THIS COUNTY'S OCEAN.

BESIDES SIMPLY KILLING ALMOST EVERY LIVING ORGANISM WITHIN RANGE (HUMANS ARE SUPPOSED TO STAY OUT OF THE WATER FROM PT. SAL TO SANDOLLAR BEACH TO AVOID DEAFNESS/DEATH), THIS 3-D TESTING WILL WIPE OUT OUR LOCAL FISHING INDUSTRY, TOURIST INDUSTRY & ALL ASSOCIATED BUSINESSES.

ALREADY PG&E IS TESTING IN OUR WATERS @ LOW LEVELS (200 DECIBELS) AND DOLPHINS ARE WASHING UP ON SHORE RIDDEN WITH SHARK BITES (DUE TO DEAFNESS) & FISHERMEN ARE PULLING IN 1/2 THEIR NORMAL CATCH.

THIS TESTING IS A SUGGESTION, IT IS NOT MANDATED. IT BREAKS MULTIPLE LAWS & VIOLATES A MARINE SANCTUARY. IT WILL NOT MAKE DIABLO CANYON SAFER & MAY EVEN DESTABILIZE THE FAULT LINES BELOW. AS PER AB1632 ALL EXISTING STUDIES OF THE AREA MUST BE THOROUGHLY REVIEWED & ANALYZED. ALTERNATE, LESS HARMFUL METHODS MUST BE FULLY EXPLORED.

IT IS YOUR RESPONSIBILITY TO FOLLOW THE PRECAUTIONARY PRINCIPAL. IF THERE IS MONEY FILLED HANDS IN YOUR POCKETS, SEARCH YOUR SOUL

AND STOP THIS BILL.

DO NOT PERMIT THIS DEVASTATION.  
IT WILL BE ON YOUR HANDS.

SLEEP WELL, CONCERNED CITIZEN  
& FISH LOVER.

10/22/12



Dear Mother  
I am writing to you from  
the city of New York  
I am well and hope  
you are the same  
I have not much news  
to write at present  
I am your affectionate  
son  
John

I have not much news  
to write at present  
I am your affectionate  
son  
John

I have not much news  
to write at present  
I am your affectionate  
son  
John



3 October 2012

Kathy McLaughlin  
136 Country Club Dr.  
San Luis Obispo, CA 93401

RECEIVED

OCT 09 2012

CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
Energy & Ocean Resources  
Cassidy Teufel  
45 Fremont St., Suite 2000  
San Francisco, CA 94105

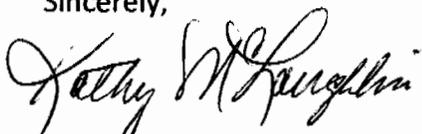
Dear Ms. Teufel,

I am writing in opposition to the PG&E Seismic Testing in the coastal waters off Diablo Canyon. I am imploring the commission to deny this testing and save the aquatic life off our central coast.

Will it change anything to verify a fault? Will it save a single human life? I believe the answer to that is no. There is no such thing as earthquake predictions, it just doesn't exist, but there is no doubt that this seismic testing **will kill our marine life.**

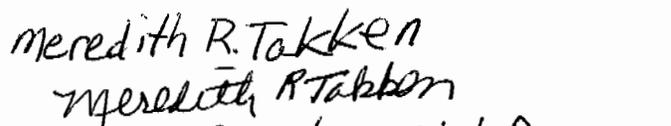
Please, please please do not allow this atrocity to occur. Deny this before it's too late.

Sincerely,

  
Kathy McLaughlin

Noreen Kilmartin

  
140 Country Club Dr  
San Luis Obispo, CA 93401

  
141 Country Club Dr  
San Luis Obispo, CA 93401

Mary Ciernia  
153 Country Club Dr.  
SLO, CA 93401

# SEISMIC TESTING

BY TOM FRANCISKOVICH

Early one morning this summer, the fog was hanging around and the seas were calm, so I decided to take a cruise around Avila Bay on my stand-up paddleboard. Far off in the distance, I would guess it was about a half-mile or so, I spotted a pair of humpback whales breaching the surface, spraying plumes of water vapor into the air, lifting their massive tails out and then back in. This continued for a while as they kept a steady pace, swimming toward the rock jetty at Port San Luis. I started paddling out for a closer look and, after a while, I was within about 100 yards of them. As I stood there marveling at how a 40-ton animal could be so graceful, I was mostly thinking about how lucky we were to live in such an amazing place that we could hang out with whales before breakfast. I continued to take it all in when I realized that it had been a while since my new friends had surfaced. I wondered where they would pop up next. As I scanned the horizon thinking they may now be out of range, a wall of gray barnacle-speckled mass rose out of the water ten feet in front of me and seemed to eclipse the sun. My knees buckled, my stomach dropped, and my heart pounded. The pair exhaled and gracefully disappeared, swimming directly below my board; the shifting water seemed to pull me along with them. It was one of the most unique and incredible experiences of my life. And, it got me thinking...

...

Despite much initial controversy, since construction started in 1968 Diablo Canyon has been a good neighbor. The nuclear power plant has generated mostly carbon-less electricity, provided a huge amount of property tax, employed friends and family, sponsored local sports teams, and on and on. It would be fair to say that a lot of goodwill has been created between Diablo Canyon and the community since its inception. But, perceptions began to change on March 11th of last year when a massive earthquake erupted off the coast of Japan. The resulting tsunami with its surging seawater, as high as 130 feet in some cases, sped toward Japanese nuclear reactors, which had been strategically built on its coastline to use the cold ocean water to cool their cores. Three reactors suffered meltdowns and at least three experienced explosions. In the days that followed uncertainty reigned and it was not inconceivable that Japan, as we knew it, could have disappeared under a mushroom cloud.

The aftermath caused much handwringing and introspection here as policymakers turned their attention inward to America's aging nuclear infrastructure, and at the top of the list was Diablo Canyon, one of two California reactors, which is perched atop the Hosgri fault (this was discovered after it was built). Later, in 2008, a second active fault was found running along the shoreline. Considering what happened in Japan, it would be logical to want to know more about the risks presented by these faults. It would make sense then to employ whatever means necessary to attempt to predict the likelihood that those faults would generate an earthquake. So, AB 42, a bill sponsored by San Luis Obispo-based State Senator, Sam Blakeslee, which requires PG&E to conduct seismic testing, became law. PG&E has since sought permits to begin testing along a 90-mile stretch of water off the shores of Diablo Canyon beginning next month.

Originally developed in the 1920's, seismic testing has been used primarily for two purposes: first, to locate oil and natural gas reserves for which it has proved incredibly effective; and, second, to analyze and map fault lines (some claim it is also able to actually predict earthquakes, but that has proved dubious at best). Although the sophistication of the equipment

used has evolved considerably, it is still based on the same relatively basic science: create massive shockwaves capable of reaching miles below the seafloor and then use sensitive listening equipment to receive the reverberations of those sound waves as they bounce back. The result is a three-dimensional map of whatever is below the Earth's crust.

While basic in its science, the resulting aftermath has been much more complicated and it seems that everywhere seismic testing has gone controversy has followed. It has been argued, although unsuccessfully, that by agitating and blasting a known active fault line with powerful shock waves, it may artificially trigger an earthquake. By definition, a fault is a point where two tectonic plates intersect; they exist under tremendous force that is constantly seeking release—any disturbance to this homeostasis could potentially cause a sudden and dramatic slippage or shift, also known as an earthquake.

“Their focus has been on the damage that may be done to the marine wildlife as a 240-foot ship tows a quarter-mile array of eighteen 250 decibel “air cannons” that send out blasts every twenty seconds, twenty-four hours a day for 42 days straight.”

But, it is not earthquakes that local opposition groups such as Stop the Diablo Canyon Seismic Testing has been worrying about. Their focus has been on the damage that may be done to the marine wildlife as a 240-foot ship tows a quarter-mile array of eighteen 250 decibel “air cannons” that send out blasts every twenty seconds, twenty-four hours a day for 42 days straight. How loud is 250 decibels? To put it in perspective, each unit of measurement is ten times louder than the last one, so 2 decibels is louder by a factor of ten than 1 decibel and so on. A gunshot measures 133 decibels, 164 decibels is like being inside a jet engine, eardrums burst at 195 decibels, at 202 decibels the sound waves become lethal to humans, and a nuclear bomb generates 278 decibels. Would opponents then be correct by asserting that PG&E would be effectively carpet bombing a sensitive marine habitat that includes the protected Point Buchon State Marine Reserve with sound waves strong enough to instantly kill a human being and is approaching the energy blast created by a nuclear warhead? The size and scope of the proposed seismic test is unprecedented and would, at least according to California Fish and Game Commissioner, Richard Rogers, “cleanse the Point Buchon State Marine Reserve of all living marine organisms.”

An article earlier this year in *Scientific American*, attempts to answer the question as to why a massive number of dolphins (at the time of its publication the count stood at 2,800) had washed up dead on remote Peruvian beaches. The article quoted local veterinarian, Carlos Yaipén, who is also the founder of Lima-based Scientific Organization for the Conservation of Aquatic Animals (ORCA). The article stated that “All of the 20 or so animals Yaipén has examined showed middle-ear hemorrhage

and fracture of the ear's periotic bone, lung lesions and bubbles in the blood. To him, that suggests that a major acoustic impact caused injury, but not immediate death." Although the article goes on to offer different hypotheses for the dolphin die-off, including toxins that may have been present in the water, only one seems plausible in that it is consistent with the injuries sustained: seismic testing by a petroleum company believed to be searching for oil deposits in the area.

currently taking place at Diablo Canyon? There is nothing that can be done to, say, add steel bracing to shore up a fault line here or fill in with cement a fault line over there. Eventually they will produce an earthquake. That's just what faults do and there is nothing that can be done to stop it. And it is unclear how the information we gain by doing the testing, which may or may not—depending on who you ask—come at a great cost to our sensitive local marine ecosystem, would mitigate the disaster resulting from a massive earthquake. It would be one thing if seismic testing was able to forecast earthquakes. For example, if by doing this we knew that next summer the Hosgri fault would produce somewhere between a 7.0 and 8.0 earthquake, then that would certainly change the equation, but predicting earthquakes with seismic testing has long been debunked—it just doesn't work. Any way we slice it, for better or worse, we are left with an aging nuclear power plant resting upon a hotbed of seismic activity perched on the side of an ocean cliff. Besides, no amount of retrofitting, it seems, could have prevented the Japanese meltdowns resulting from what turned out to be a 9.0 earthquake. Realizing this reality, Japan last month announced that it is phasing out all 50 of its nuclear reactors by 2040.

Although seismic testing is on schedule to begin next month, there is still one big hurdle to clear: the California Coastal Commission. The group will be hearing the issue in Oceanside on October 10th and it appears they may be leaning toward approving the project, as they gave PG&E the green light to install six seismic monitoring devices on the seafloor near Diablo Canyon in April.

• • •

Maritime lore is rich with a history of harrowing shipwrecks and sailor survival stories. Many of them feature a friendly sea mammal, typically a dolphin or a whale showing the way to safety or providing a lift to someone in dire need, often just before death. In those instances sailors describe a unique bond and a method of communicating between species that is difficult to comprehend, and probably impossible unless it is within the context of some extreme emergency or crises. After briefly interacting with the humpbacks myself this summer, I can begin to see how there may not be as much separating us as we may believe. Although I likely encountered the whales early on in their visit to Avila Beach—probably just as they entered the bay—so many of us were able to have our breath taken away by these majestic creatures who paid us a very special visit this summer. But, maybe, they were here for a reason. Maybe they were trying to tell us something. **SLO LIFE**

### Dolphin carcasses washed ashore along a remote Peruvian beach.

Anticipating the effect testing may have on the local fishing industry, PG&E has offered \$1.2 million as compensation for the loss of revenues during November and December. Giovanni DeGarimore, who owns and operates Giovanni's Fish Market & Galley in Morro Bay says, "Initially, when I first heard about this, I took a somewhat self-centered position and it all came down to how much will PG&E be compensating me? But, the more educated I became on the subject the more I realized how much bigger this is than me. And, I'm not a political activist type, but at some point you have to stand up for what you believe in." In many ways DeGarimore is at the center of Morro Bay's fishing industry. In addition to selling fish in his market, he is also in the business of unloading the daily catch from commercial fishing vessels as well as selling fuel to the fisherman who almost never lack an opinion. "It's been really refreshing to see the fisherman go from saying, 'How much can we get from PG&E?' to saying, 'Hey, we don't want this it all, I don't care how much you pay us. This is bad; really, really bad.' We're not just looking at total devastation of the mammals, but also the fish and who knows if it ever comes back. And all this for what? So, PG&E can get a new map to renew their license for another 20 years?" It's worth noting that the cost of seismic testing is estimated at \$64 million, which PG&E will be charging to their customers—you and me—in order to cover the expense.

While policymakers' intentions appear to be noble—looking after the safety of Central Coast residents—it is not entirely clear how the results of seismic testing would achieve that goal. Just how do highly detailed three-dimensional maps of the area's spider web of fault lines change anything

Want to know how you can weigh in on seismic testing? Contact the California Coastal Commission before their meeting on October 10th to voice your opinion.

California Coastal Commission  
Energy & Ocean Resources  
Cassidy Teufel  
45 Fremont Street, Suite 2000  
San Francisco CA 94105  
(415) 904-5502  
(415) 904-5400 fax  
c.teufel@coastal.ca.gov

Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

**RECEIVED**

**OCT 09 2012**

CALIFORNIA  
COASTAL COMMISSION

Dear Mr. Teufel,

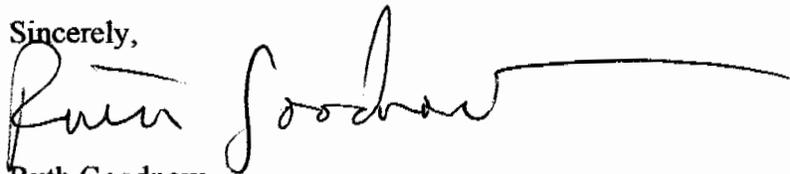
I understand that you enjoy a reputation of being accessible to the general public. Thank you for that, and because of it, I know you will take my comments seriously. I am a member of the general public, living in San Luis Obispo, and I vehemently oppose the proposed seismic testing slated to be conducted in Central Coast waters this fall by PG & E.

I realize that AB 42 ( the bill sponsored by San Luis Obispo-based State Senator, Sam Blakeslee, that requires PG & E to conduct seismic testing in our waters) was an attempt by policymakers to look after the safety of the Central Coast residents following the tragedy in Japan last year. But, as Tom Franciskovich, publisher of *SLO Life Magazine*, asks in his article "Seismic Testing" (October-November 2012), "...how do highly detailed three-dimensional maps of the area's spider web of fault lines change anything currently taking place at Diablo Canyon? Eventually, they will produce an earthquake... and there is nothing that can be done to stop it."

The tragic cost of this testing with dubious information to offer is the probable devastation of the Central Coast's unique and abundant marine life. Some say those magnificent whales that visited us recently may never come to our waters again. I read in Franciskovich's article that many in our local fishing industry were at first interested in what they could "get" in terms of compensation from PG & E for damage to sea life in our waters. But now they are more interested in the preservation of that sea life.

I beg you to use your influence in your upcoming meeting to stop this testing debacle from happening.

Sincerely,



Ruth Goodnow  
1245 San Mateo Drive  
San Luis Obispo, CA 93401  
805-458-4438

Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

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Sincerely,

Lynda Baggett

Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

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OCT 09 2012

CALIFORNIA  
COASTAL COMMISSION

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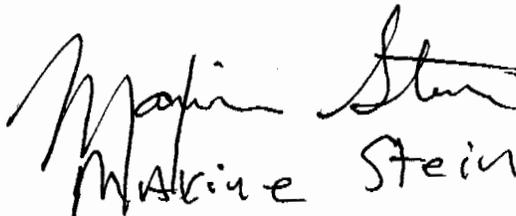
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I beg you to use your influence in your upcoming meeting to stop this testing debacle from happening.

Sincerely,

  
Marine Stein

Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

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OCT 09 2012

CALIFORNIA  
COASTAL COMMISSION

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I beg you to use your influence in your upcoming meeting to stop this testing debacle from happening.

Sincerely, *Paladin Gravelle*

*Paladin Gravelle*

Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

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OCT 09 2012

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COASTAL COMMISSION

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I beg you to use your influence in your upcoming meeting to stop this testing debacle from happening.

Sincerely,

**Scarlett Gravelle**



Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

**RECEIVED**

**OCT 09 2012**

**CALIFORNIA  
COASTAL COMMISSION**

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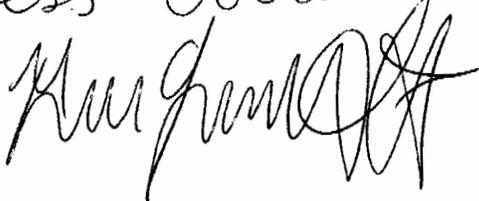
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Sincerely,

Tess Goodnowott  


Mr. Cassidy Teufel  
California Coastal Commission  
Energy & Ocean Resources  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105

October 2, 2012

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OCT 09 2012

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COASTAL COMMISSION

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Sincerely,



10/3/12

October 2, 2012

California Coastal Commission  
45 Fremont Street  
Suite 2000  
San Francisco, Ca. 94105-2219

RECEIVED  
OCT 05 2012  
CALIFORNIA  
COASTAL COMMISSION

Dear Commissioners:

Regarding the proposed high-decibel airgun seismic testing scheduled to commence in November, I implore you to deny the permit outright. This will admittedly cause "harassment", at least, of thousands of whales, dolphins and seals of 25 different species. Every form of marine life will be affected from the start of the food chain to the great whales. Pelagic birds will also be affected – to what degree? No one knows the full extent of this bombardment from deafening of the hearing capacity, to changes in migratory routes and disrupting reproductive behavior.

There is also the human element to be considered. From the fishing industry, tourism and sporting to freedom to use the beaches and waters of our Coast, all will be negatively impacted by the extremely loud underwater airguns that will be used in the 530 square nautical miles of the proposed testing area.

While the operation of Diablo Canyon Nuclear Plant poses significant, undeniable risk, it is unconscionable to use this method of testing that cannot be mitigated. These tests that are NOT mandated in AB1632 should be postponed unless and until a less harmful method of surveying the many seismic faults that are near and under the nuclear plant can be ascertained.

As a permitting agency, you MUST use the precautionary principal and deny this application. The decades of seismic data that have not been used and analyzed should be thoroughly peer reviewed.

Sincerely,



Marilyn E. Brown

Concerned Citizen

San Luis Obispo County

5385 Palma Avenue  
Atascadero, Ca. 93422  
805-423-8500  
brookdiego@gmail.com

Dear Coastal Commissioners,

I am writing to you today about a matter of great concern to me and everyone who cares about California.

As I hope you are aware PG&E is planning to do seismic testing in November of this year by using air guns to shoot loud noise into the waters off our coast every 15 seconds for 33 days. The more I have learned of this type of testing, the more concerned I have become. This will be very detrimental if not deadly to the marine life in our waters.

Please do not let corporate desire and influence override environmental concerns and common sense. Stop this test before it is too late. Thank you for your concern and attention to this important matter.

Sincerely,

*Alexandria Michell*

Alexandria Michell

*Upland CA*

*San Luis Obispo County*

**RECEIVED**

OCT 02 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

RECEIVED

OCT 01 2012

CALIFORNIA  
COASTAL COMMISSION

Dear California Coastal Commissioners:

I am writing to express my opposition to PG&E's Proposal for Seismic Testing off the Central Coast.

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I am deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

I am also concerned that PG&E is disregarding the health and safety of ocean users. Their EIR clearly says the proposed activities would expose persons present in the water to harmful noise levels. And a recent PG&E map shows that dB levels could reach upward of 160 at some beaches. This is well over the threshold for human safety.

Finally, I am concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

Please deny this project. The Coastal Act was created to protect ocean resources and recreation. We believe this project does not conform to following sections of the Coastal Act:

**\*\*Section 30220--Protection of certain water-oriented activities--** Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

**\*\*Section 30224--Recreational boating use--**Increased recreational boating use of coastal waters shall be encouraged.

**\*\*Section 30230-- Marine resources; maintenance**  
Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

**\*\*Section 30210-- Access; recreational opportunities; posting**  
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...

We urge you to deny this project in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "R. J. Winn Sr.", written in a cursive style.

ROBERT JAY WINN SR  
10730 MORTICAN DR  
BAKERSFIELD, CA 93312  
661-589-3384

RECEIVED

OCT 01 2012

Dear California Coastal Commissioners:

I'm writing to express my opposition to PG&E's Proposal for Seismic Testing off the Central Coast .

CALIFORNIA  
COASTAL COMMISSION

As a lifelong sportfisherman, I can recall some 15 to 20 years ago when the DFG did the fish surveys that lead up to the lower bag limits on Rock Fishes and Lingcod, along with the season of only about 6 months out of the year. After all these years, and finally getting some of these fishes back up and going again, and not knowing if it was just a cyclic period, which is very common in nature, or whether the actions by the F&G actually did have the impact on the fishes, now we are faced with the possibility of a near to total wipe-out of nearly everything in the coastal waters, and including the well protected seals, sea lions and otters along a long stretch of this beautiful and bountiful coast. We fishermen and women just feel like all the years we have had to cut back are getting laughed at and thrown under the rug. The fact is that if Mother Nature decides to make an earthquake large enough to do huge amounts of damage, as was the case in Japan a couple years ago, nothing man makes is big enough or sturdy enough to withstand her wrath. Over the life of mankind, it has had to accept and endure those wraths and we will again. Therefore, no testing that could possibly do as much damage as Mother Nature could be worth the risks.

This project could have dangerous impacts on ocean ecosystems and recreational ocean users.

PG&E's own EIR clearly states unavoidable impacts to marine life. As an ocean enthusiast, I'm deeply concerned about the impacts to marine life during the testing. California is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

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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...

We urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life and ocean users from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely, Ed Coleman, Bakersfield, Ca.

---

 9/27/12

7 Mustang Drive  
San Luis Obispo, CA 93405  
September 29, 2012

Dear Deputy Director Dan Carl,

My name is Camille Torres. I live in San Luis Obispo. I have grown up next to the ocean all my life; I've been taught to care for marine animals. We are not the only life on this planet that we need to protect. The sea life deserves our respect. Do not follow through with the sonic testing. It is inevitable that marine life will be hurt and killed if this testing is not stopped. Thank you Deputy Director Dan Carl. You have the power to save lives.

Sincerely,

A handwritten signature in cursive script that reads "Camille Torres". The signature is written in black ink and is positioned to the right of the word "Sincerely,".

Camille Torres

Sharon Moran

1223 S Arkle St

Visalia, Ca. 93292

CA Coastal Commission, Central Coast District Office

725 Front Street, Suite 300, Santa Cruz, CA 95060-4508

To Dan Carl, Deputy Director

Dear Mr. Carl

I am writing to express my disapproval of the seismic testing that PG&E has planned in the waters around the Diablo Canyon Nuclear Power Station. **I am appalled the PG&E is requesting to "take" 78 California gray whales, 11 humpback whales, 12 blue whales, 1,468 short-beaked dolphins, 66 long-beaked common dolphins, 152 Pacific white-sided dolphins, 91 Northern right whale dolphins, 1,321 bottlenose dolphins, 849 California sea lions, 1,188 Southern sea otters, and 3,736 Morro Bay harbor porpoises, among others (New Times article by Matt Fountain).** This is totally unacceptable!! I do not want to see these creatures washed up on the shores of California or elsewhere. **I demand that this approval be rescinded immediately.**

I would like to see Diablo Canyon closed. Have we learned nothing from the experience of the Japanese? The mapping will not change the fact that this power station is built on a fault line that will eventually slip. It is not if there will be a melt down but when. It was a big mistake to build the station in that particular place to begin with. Do not make another equally disastrous mistake. Your families live here too. I'm sure you do not want to see them endangered.

Please do the right thing and dismiss the approval of the seismic testing. Close Diablo Canyon down!!

Sincerely,

Sharon Moran

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
(831) 427-4863  
FAX (831) 427-4877

**RECEIVED**

SEP 28 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Commissioners,

I am writing to address the proposed Seismic Mapping to be conducted for PG&E near Diablo Canyon in San Luis Obispo County. I encourage you to not approve any permitting for this survey. The cost to our marine life will be devastating. This survey will take place within three Marine Protected areas, adjacent to a National Marine Sanctuary, adjacent to a National Estuary and in an area of our ocean inhabited and used for migratory routes by thousands of marine mammals.

The Marine Mammal Protection Act prohibits harassment of any kind to marine mammals, this harassment or "take" includes the altering of normal behavior. The EIR on this project asks for a take permit to allow possible level A take (table 4.4-14) of thousands of marine mammals. Level B take estimates (table 4.4-15) list nearly 5000 individuals that are expected to be harassed or killed.

The EIR proposes to mitigate take with observers, aerial and on deck, and by "ramping up" to chase animals away. Chasing marine mammals from their normal behavior and waters is harassment and in violation of federal law. Additionally, some whales are known to move towards the sound, not away.

This survey is planned for November when it expects no whales or migratory animals will be near. Humpback whales are often seen in this area in November and early Grey whales are migrating on their way to birthing waters in Mexico. Elephant seals are also migrating to breeding ground on the Channel Islands during November. Dolphins, Morro Bay Harbor Porpoise, Harbor seals, California Sea Lions and sea otters all inhabit this area year round. The critically endangered Western North Pacific population of the California Grey Whale is known to populate the waters off San Luis Obispo County during the proposed time of the seismic testing. Even a very small number of deaths of this group will cause the subpopulation to decline.

There is already extensive knowledge of the fault zones and it has been admitted by PGE and many of their own experts that these tests will not show any new information.

Please deny this permit. The impact to our marine ecosystem is not worth the benefit.

Sincerely,

  
Jon HANLON, PE

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
(831) 427-4863  
FAX (831) 427-4877

**RECEIVED**

SEP 28 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Commissioners,

I am writing to address the proposed Seismic Mapping to be conducted for PG&E near Diablo Canyon in San Luis Obispo County. I encourage you to not approve any permitting for this survey. The cost to our marine life will be devastating. This survey will take place within three Marine Protected areas, adjacent to a National Marine Sanctuary, adjacent to a National Estuary and in an area of our ocean inhabited and used for migratory routes by thousands of marine mammals.

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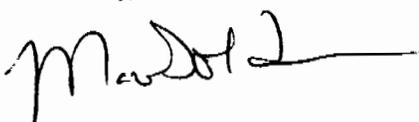
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Please deny this permit. The impact to our marine ecosystem is not worth the benefit.

Sincerely,

  
Marni Goldenberg

**California Coastal Commission  
Central Coast District Office  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508**

**RECEIVED**

SEP 28 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Ms. Cavalieri,

I'd just like to start out by saying that I am 51 years old and this is the first time I have ever felt moved enough by an issue to begin writing letters to agencies about it. That is how important I feel this is.

I am writing in the hopes that the CA Coastal Commission will be willing to decline the permit PG&E is seeking to conduct seismic testing due to take place off the Central Coast of CA in a month or so. Your job, as I have always understood it, is to protect and manage the coastal resources of our state, both on and off-shore. This testing will potentially damage a significant number of species in an environmentally significant area along the Central Coast, with long-term impacts to the eco-system unknown, and impacts to local fishing businesses known and potentially damaging, long-term.

One section of the impact report the Coastal Commission was given (which I assume you have a copy of) discusses the feasibility of alternatives to the seismic testing. One is to conduct no study, and go off information already known about the faulting in the area. This is the correct option. Diablo Canyon sits in an active fault zone -- one that we've known about for years -- and constructing scenarios based on extrapolation of knowledge from current data is a perfectly valid way to assess risk, without harming either sensitive marine life or area businesses.

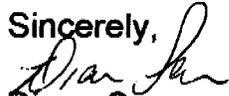
Besides, a tsunami could just as likely be caused by an earthquake in Oregon, off the northern California coast or even from farther out in the ocean as it could from a fault directly off the shore of the Central Coast. PG&E needs to retrofit or do whatever it takes to make Diablo Canyon safe. The destruction that will take place with the off-shore seismic testing is simply unnecessary and too expensive, considering the cost to marine mammal and aquatic life.

This is not your problem, it is PG&Es. If you demand they use another method, they will have to do so. The decision rests in the hands of the Coastal Commission. It is not your job to create a safe power plant. It IS

your job to see that our coastal resources are protected and used wisely (I know you already know that).

Please do not allow the CA Coastal Commission to go down as signing off on this proposal on your watch, and therefore being partially responsible for the destruction which may ensue off our coast. Please, please, stop this before it starts.

Sincerely,



Diane Sayre

2125 Maverick Way  
Paso Robles, CA  
93446

September 27, 2012

Shannon Asquith  
1215 15th Street  
Los Osos, CA 93402

Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
(831) 427-4863  
FAX: (831) 427-4877

Subject: Protect whales from dangcrous seismic testing

I'm writing to express my opposition to PG&E's proposal for seismic testing off California's central coast.

This project could have dangerous and deadly impacts on marine life and the ocean ecosystems they depend on for survival.

PG&E's own EIR clearly states unavoidable impacts to marine life. The California coast is known for its rich ocean waters and we need to protect every level of our ocean ecosystem from risky and arguably unnecessary projects, such as seismic testing.

Finally, I'm concerned that PG&E is not analyzing decades of data collected by several sources to paint a full picture of geologic hazards near the power plant, new testing will only provide marginal improvement to what is already known.

I urge you to deny this project and send PG&E "back to the drawing board" in order to protect marine life from this unnecessary project.

Thank you in advance for your thoughtful consideration.

Sincerely,

  
Shannon Asquith

Dear Coastal Commission - Diablc Canyon Seismic "Slaughter" Program **Received**

SEP 27 2012

I am writing you today regarding the seismic mapping of Diablo Canyon by PG&E. I am absolutely HORRIFIED that anyone would consider this. I view this as another failed Cheney Policy: An excuse for corporate welfare for oil. I do not believe for a minute that this "MAPPING" is being done for fault line assessment. I believe it's being done for oil and/or natural gas the drilling of which is to be paid for by the American tax dollar per Cheney's secret Energy Commission which set up the legal framework for this scam. It's one thing to take over our tax dollars, but destroying our environment for purposes of PROFIT? I DO NOT THINK SO. NOT ON MY WATCH. I WANT THIS STOPPED AND STOPPED NOW! NOT ONE WHALE, NOT ONE DOLPHIN. NOT NOW, NOT EVER.

It is a well-known fact that our sea mammals are intelligent nurturing creatures. It is a well-known fact that these 'BLASTS' from "AIR CANNONS" cause damage and death. PG&E said so on KSBY news. They stated people had to stay 2 to 3 miles away to prevent injury because seismic blasts could be 'fatal'. They also claimed or bragged that they "HAD BEEN MAPPING ALL OVER THE WORLD AND IT IS PERFECTLY SAFE". How could this be "perfectly safe" when they just told us everyone had to be 2 to 3 miles away to prevent injury and that these blasts could be fatal? This whole thing stinks. I think they want us far away so we cant count the carnage they leave behind. NO NO NO NO NO.

I am also horrified that this would be considered when we are facing severe weather disruption which is and will lead to severe food insecurity. EXACERBATING THIS by killing off 25% of our ocean "mapping" for PG&E's profits IS UNACCEPTABLE. It is also unacceptable that we are killing off mother and calf pairs of whales. This is supposed to be protected sanctuary for their calving activities!

Reports from all over the world of mass whale beachings right before major earthquakes (i.e. Fukushima) have been made leading me and others to wonder if this blasting will not only deafen and destroy our incredible and precious sea-life but possibly CAUSE MAJOR EARTHQUAKES around the world.

I am dismayed that we can visit and explore Mars frequently but we cannot figure out a way to map ocean floors without destroying irreplaceable treasure. This is not an equal trade. We cannot wholesale our Earth's resources just to take a looksee at things. It is NOT OK for anyone to arbitrarily take our natural resources for their profit, and to add insult, charge us to do it and then leave us with a desert where once a rich an abundant ocean existed.

It is well known and does not need reiteration, but we must treasure our oceans. Without our oceans we cannot exist. So please, help us stop this insanity. We need oceans. We DO NOT NEED MORE OIL nor do we need a nuclear power plant on a major fault line. What were they thinking?

This project is wrong on so many levels, it's hard to know where to begin. But it's easy to know where to stop and that's right here. Let's not let this atrocity go forward another step.

Sincerely

Karen Archer-Hutchison

September 27, 2012

**RECEIVED**

OCT 02 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Executive Director Charles Lester  
California Coastal Commission  
45 Fremont Street  
Suite 2000  
San Francisco, CA 94105-2219

Subject: High energy seismic survey of the ocean around Diablo Canyon

Honorable Charles Lester:

Legislation has passed that ordered PG&E to conduct seismic testing of nearby faults. It is known that seismic tests are harmful to marine life; testing can ruin the hearing of marine mammals, like whales and dolphins, seals and sea lions, as well as scaring away all the fish. The EIR says that sonic blasts might even trigger an earthquake. Senator Blakeslee had good intentions when he pushed through legislation to require testing but in the long run ratepayers and marine mammals will pay and PG&E will not have gained anything.

If the tests reveal there is reason for concern, then what? Would Diablo be retrofitted? Would the plant be re-licensed? Will these tests lead to the closure of Diablo, which is what the activists really want? Unlikely. Tests will settle nothing regarding re-licensing of the plant. With all the money spent on construction, safety and now testing, PG&E will not go away. In fact it will cost taxpayers more in the long run to mitigate all these costs. So what is the point of this testing?

How do you compensate for a dead dolphin or whale? What's more important, peace of mind for us humans or the very right to exist for marine life? Is it worth the risk of having perhaps dozens of mammals harmed or even killed to gather information on whether we should be worried about Diablo withstanding an earthquake? Doing these tests only to possibly gain some piece of mind would cost ratepayers in the long run, won't settle any of Diablo's controversies and isn't worth the risk of killing a single whale.

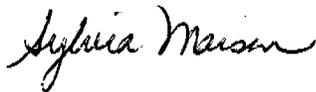
There should be a requirement that when the first marine mammal dies because of these tests, they stop immediately.

C. Lester  
September 27, 2012  
Page 2 of 2

Please consider the real impacts of seismic testing and reconsider the cost vs. benefit and value to humans and marine life in general. If we have a big earthquake in California, there will be more than Diablo Canyon to worry about. It's a fact that it's not just IF we will have an earthquake, but WHEN. So money could be better spent on retrofitting and installing safety systems, rather than testing and causing havoc with marine life.

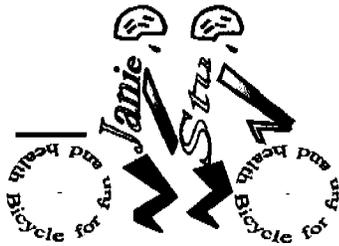
Your consideration in this matter is appreciated.

Regards,



Sylvia Marson  
339 Walnut St  
Costa Mesa, CA 92627  
949-645-9348  
sylviamarson@sbcglobal.net

Copy:  
Dan Carl, Deputy Director, Central Coast District Office  
Madeline Cavalieri, District Manager, Central Coast District Office  
Neil Farrell, Tolosa Press



# Stu and Janie Goldenberg

1675 Crestview Circle  
San Luis Obispo, CA 93401-6073  
sgoldenb@calpoly.edu

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September 26, 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
(831) 427-4863  
FAX (831) 427-4877

Dear Commissioners,

I am writing to address the proposed Seismic Mapping to be conducted for PG&E near Diablo Canyon in San Luis Obispo County. I encourage you to not approve any permitting for this survey. The cost to our marine life will be devastating. This survey will take place within three Marine Protected areas, adjacent to a National Marine Sanctuary, adjacent to a National Estuary and in an area of our ocean inhabited and used for migratory routes by thousands of marine mammals.

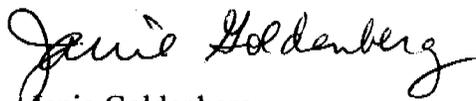
The Marine Mammal Protection Act prohibits harassment of any kind to marine mammals, this harassment or "take" includes the altering of normal behavior. The number of animals that will be harassed or taken (=killed), to put in perspective, is equivalent to one and a half times the number of animals at the San Diego Zoo.

There is already extensive knowledge of the fault zones and it has been admitted by PG&E and many of their own experts that these tests will not show any new information. In addition to the research by PG&E, the USGS has extensive information about the significant faults in the area (Hosgri and Shoreline).

Please deny this permit. The impact to our off shore neighbors is too massive to be ignored.

Sincerely,

  
Stu Goldenberg

  
Janie Goldenberg



“The WHALE TAIL® Grants Program distributes funds from sales of the WHALE TAIL® License Plate. The grants support programs that teach California’s children and the general public to value and take action to improve the health of the state’s marine and coastal resources.”

September 26, 2012

California Coastal Commission  
Central Coast District Office  
Deputy Director Dan Carl  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508.  
FAX (831) 427-4877

Dear Deputy Carl,

**“PG&E is requesting to “take” 78 California gray whales, 11 humpback whales, 12 blue whales, 1,468 short-beaked dolphins, 66 long-beaked common dolphins, 152 Pacific white-sided dolphins, 91 Northern right whale dolphins, 1,321 bottlenose dolphins, 849 California sea lions, 1,188 Southern sea otters, and 3,736 Morro Bay harbor porpoises, among others.” (New Times article by Matt Fountain).**

It would be cruel and inhumane to subject highly intelligent mammals that utilize sonar to survive to the damaging blasts necessary to conduct seismic testing. It would surely mean a horrible slow death to many of them. To me, we would be conducting something just as, or even more horrific than the annual dolphin kill in Japan. The Gray Whale has come back from near extinction, its numbers are still limited, and yet, seismic testing is planned as they make their annual migration through the very area the testing is to take place.

The Coastal Commission espouses on its own page the importance “to value and take action to improve the health of the state’s marine and coastal resources.”

Please do not allow the Seismic Testing slated to take place. It is too large a threat to the irreplaceable resource of marine life that resides within and passes through the testing area.

Earnestly,

Cindy Fear  
317 E. Cherry Ave.  
Arroyo Grande CA  
93420

Tara Renee Hurson  
7427 Shelby St.  
Elk Grove CA 95758  
RE: PG&E Seismic Testing of  
Diablo Canyon

September 26, 2012

CA Coastal Commission  
Dan Carl, Deputy Director  
725 Front St. suite 300  
Santa Cruz, CA 95060

CC: Don Miller, Editor  
Santa Cruz Sentinel

**RECEIVED**

OCT 01 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Dan Carl:

I am writing to respectfully request that you deny PG &E the permit to blast 250db into our central coastal waters. It sounds like a terribly dangerous idea. Besides the untold damage and death of our marine wildlife, how will people be kept safe from this testing? There are surfers out there! If PG&E really cared about the safety of people they would shut down this nuclear power plant. It was built on fault lines! PG&E doesn't seem to care about our Protected Marine Reserves either, as they originally were going to blast through 4 others besides the Point Buchon and Morro Bay protected areas. Aren't there other ways this information can be acquired? Please tell PG&E they must not cause this horrific devastation, instead they must find a safer way. It makes me seriously wonder what PG&E is really after. As it should you. The publicity around this issue is growing and will continue to grow. You have the power to be a hero of the people. I hope you will choose to be on the side of the people, not the corporation. Don't let PG&E desecrate our coast. Please do not let us have to explain to our children that our precious marine animals, which were supposed to be protected instead, were murdered in the name of corporate greed.

Sincerely,



Tara R. Hurson  
Concerned Citizen

Dear California Coastal Commission,

My name is Michael Shane Stoneman and I am a resident of Los Osos, Ca, a small bed room community just north of the Diablo Canyon power plant. I have shaped surfboards for a living for a dozen years and often surf in the Montana De Oro State Park which butts up to PGE land (north side). I am deeply concerned about this PGE tests and the effect it will have on all of our lives here on the coast. I fear for the safety of whales, fish, and also surfers. We often surf at some of the waves in MDO state park just north of Point Buchon and I haven't seen anyone speak about the possible health problems that will occur from surfers wiping out or "duck diving" under waves at such a close proximity to the sound bombs going off every 15-20 seconds in the area. There is a whole other group of surfers just south in Avila and Shell Beach that share my concerns.

My other concern is the impact this will have on fishing. My eight year old daughter and I have fished in Montana De Oro state park and I have enjoyed teaching how to be self reliant and respectful of the fishery. This test shows a corporations blatant disregard for the MPA and the idea of intelligent management. It uses the tragedy of Fukushima to go on what looks like an oil exploration expedition and have the nerve to charge its customers for it too.

Please consider these possible outcomes and tell PGE that they can't kill whales, ruin an MPA, and possibly injure surfers and divers.

Sincerely,  
M Shane Stoneman  
1572 10th st.  
Los Osos, Ca 93402



**RECEIVED**

SEP 26 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

To whom it may concern.

I am taking the time out of my busy work week to address the fact of "seismic testing" on the central coast is a bad idea.

our Many families including my mother, enjoy the ocean daily. She outrigger paddles, swims, surfs, and walks the beaches of the central coast daily. To continue the testing and kill wildlife is not only killing nature, but killing my mother's soul slowly.

I will be having a son January 2012. It would be nice to take my son to the beaches where I grew up and learned to appreciate and love nature and animals. It would be a shame, to have to explain to my son why there are no more seals or otters left to watch at grandmas house.

please do not Rob the central coast of its <sup>beauty</sup> ~~one~~. it says in the name "central Coast"

Dont DESTROY IT!

**RECEIVED**

SEP 26 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Keith Steele  
Paul Stahl

Tuesday, September 25, 2012

VIA FACSIMILE - (831) 427-4877; (916) 558-3160

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

**RECEIVED**

OCT 02 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Directors,

Recent findings have put the Diablo Canyon Power Plant in a dubious position. This nuclear power plant rests along the California coast in Avila Beach of San Luis Obispo County. While this makes the power plant's location picturesque, it also makes it truly vulnerable to tectonic activity. Because of this, Pacific Gas and Electric Co. is planning on conducting a reckless program of seismic underwater testing.

This testing stems from poor initial planning, as the plant was built in 1968 at the mouth of a coastal canyon. Improper surveying at the time failed to reveal that this coastal canyon rested directly above a then unknown fault line, the Hosgri Fault. To add to the concern, another previously unknown fault line was recently found to run perpendicular to the Hosgri Fault, this new one running along the shoreline of the region.

Pacific Gas & Electric Co., upon discovering this, began to conduct plans to utilize seismic testing methods in order to generate a three-dimensional map of the shoreline fault's deeper regions. This process will be done by firing high-energy air guns which are dragged in an array behind a research vessel. Hydrophones placed in the water and geophones on the sea floor are then used to collect data on the sound as it resonates through the water and ocean floor.

This testing has proven to radically alter behavior in cetaceans (whales, dolphins, and porpoises), causing them to alter migration and breeding patterns to avoid these sound sources. This disruption also impacts the safety of these animals. The inquisitive nature of many dolphin species makes them especially vulnerable as they have a tendency to approach research vessels, sometimes bringing them directly in front of these air cannons as they are firing.

Pacific Gas and Electric must not be allowed to continue with these plans. The habitats of these oceanic mammals must be respected by forcing Pacific Gas and Electric to cancel their plans to conduct seismic surveying. These animals should not be punished for the poor placement of their power plant.

As a California resident, I am horrified by the thought that this testing would be allowed to take place. Please let my voice be heard for the marine life. I am against this 100%.

Rosalind Goodfellow  
1338 N Brighton St.  
Burbank, CA 91506

CC: Governor Jerry Brown

September 25, 2012

**RECEIVED**

SEP 25 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

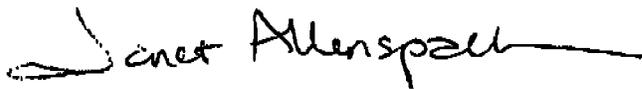
California Coastal Commission  
FAX #: 831-427-4877

To Whom It May Concern:

I am dismayed to learn that you are allowing seismic testing to occur in the waters of my neighborhood. I live in Los Osos, near Montana de Oro, and am an active and diligent steward of the ocean and land. I do not believe in any way that this testing is necessary, and I do believe that it is highly harmful to the environment.

Studies have already shown that the fault lines run too close to Diablo Canyon and I cannot understand why another test will make any difference. It will only cause harm to the animals in the ocean, those who are active in the ocean, the fishermen, the local economy, the environment, the county and the world in general. I am therefore asking you, as a registered voter and active participant in our democracy, to stop the seismic testing that you have planned for later this year.

Thank you.



Janet Allenspach  
591 Ramona  
Los Osos, CA 93402

Attention: Coastal Commission

Re: PG+E

Dear Coastal Commission:

I would prefer that we not endanger the  
Central coast marine animals and the surfers.  
Please. I hope you can stop PG+E from continuing  
on w/ the Diablo Canyon seismic testing.

Thank you,

Sergio C. Monoz

Intelatin.com

Tel: 310.700.5020

**RECEIVED**

SEP 25 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

**RECEIVED**  
SEP 25 2012  
CALIFORNIA  
COASTAL COMMISSION

**Attn: Cassidy Teusel**

FAX 415-904-5400

**Re: Agenda Item Wed 17A**

**To the Coastal Commission and all those concerned;**

**Please protect our oceanic environment and habitat and deny seismic testing by PG&E.**

**The testing is in my opinion not proven necessary for the amount of damage the fragile oceanic wildlife will sustain.**

**Nuclear Power plants on several faults next to the ocean has been proven dangerous already by what happened at the Japan sites. Also solar flares are a huge concern even more than earth quakes at this point.**

**There are lots of dangers associated with the plant at this location.**

**We don't need to blast the oceanic creatures such as the otters who are plentiful in this region and I am very concerned for their and many other creatures lives. They can't be considered collateral damage in this most unnecessary test that is proposed.**

**I hope you are going to stand up for your domain; the ocean life and it's health and the endangered species in our area. This is truly unacceptable to me. I hope you can see this the same way. Please stand up for us and our beautiful area. We are the last estuary with so many creature's lives in the balance on this oasis on the California Coast.**

**Thanks so much for hearing all our voices.**

**There are so many of us who believe in protecting our oceans from this assault on humans and oceanic life.**

**Katie Franklin  
1613 7th St  
Los Osos, Ca 93402**

Mr. Carl:

I am writing to make sure you hear my voice of strong protest against the PG&E seismic testing!

As Californians, we do not want to take our kids to the beach to witness a scene of gore: dead, injured, dying, maimed animals washed ashore. Our children are educated to love marine life and they will be **deeply traumatized** to learn that massive killing has been inflicted on purpose by the gas utility.

As a scientist, I reject the idea that, to prevent a nuclear accident, an experiment that is comparatively as destructive must be made. We are talking about many, many animals that will be killed NOW, rather than in the eventuality of a nuclear accident.

As a taxpayer, I reject the idea that I should pay for the education system to produce millions of dollars worth of resources to teach my children how to protect the environment while as a PG&E customer, I am forced to contribute equally to the immediate and irrevocable destruction of same.

Please let us not, as Californians, join the club of the Japanese and the Norwegians on the barbarity scale of the modern world. Maybe we can show something was gained by the billions poured into education in this state.

Please DECOMMISSION the ancient plant! I'm sure every person who is on the protest list will gladly contribute and chip in a bit to have PG&E build a modern plant. **There are modern reactor designs out there that keep the core from melting even in the event of a total electrical black-out!** PG&E has to scrap the old technology and build a modern, safe nuclear facility. Even with the better models they could build from the seismic data, the fact that the facility is old and obsolete will not change. With a new facility, all Californians: residents, PG&E, government and marine life together, can sleep soundly knowing that advanced design and modern technology will keep them safe in the event of an earthquake.

Almost every family in this state has, at some point in its life, made the decision to lose money on an old appliance in order to buy a more efficient new appliance. PG&E has to make the same kind of decision now. Corporate greed prevents them from making a sound decision. Please help them understand that the people of California expect them to do exactly what we all do by recycling our garbage, donating to conservation societies, educating our children to lessen their carbon footprint, militating against the use of plastic bags, and the list goes on. We feel **betrayed in our conservation efforts** by the carelessness with which PG&E decides to go ahead and start a **marine holocaust** on our doorstep.

And yes, we do not believe in the 'mitigation' efforts that PG&E is trying to plug the gap with. It is really not a matter of great intelligence to realize that there is no way, scientific or other, in which the entire fauna this side of the Pacific Coast can be taken out of harm's way. Please do not allow PG&E to shed blood on our beaches!

Regards,



Cleo Borac, M.Sc. Applied Physics  
1138 Grand Teton Dr  
Pacifica  
CA 94044

**RECEIVED**

SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Hunter Kilpatrick  
2647 Greenwood Ave. #C  
Morro Bay, Ca. 93442  
September 14, 2012

**RECEIVED**

SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dan Carl  
Deputy Director  
California Coastal Commission  
725 Front Street Suite 300  
Santa Cruz, Ca. 95060-4508

Dear Mr. Carl and Commissioners,

I am writing to address the proposed HESS to be conducted for PG&E. I will not waste your valuable time by reciting extensive documentation but encourage you to not approve any permitting for this survey. The cost to our marine life will be devastating. This survey will take place within 3 Marine Protected areas, adjacent to a National Marine Sanctuary, adjacent to a National Estuary and in an area of our ocean inhabited and used for migratory routes by thousands of marine mammals.

The Marine Mammal Protection Act prohibits harassment of any kind to marine mammals, this harassment or "take" includes the altering of normal behavior. The EIR on this project asks for a take permit to allow possible level A take (table 4.4-14) of thousands of marine mammals. Level B take estimates (table 4.4-15) list nearly 5000 individuals that are expected to be harassed.

The survey proposes to mitigate take with observers, aerial and on deck, yet will operate 24 hours a day. I am curious how these observers will find any animals at night while the blasts are continuing. Mitigation is also planned by "ramping up" to chase animals away. Chasing marine mammals from their normal behavior and waters is harassment and in violation of federal law.

Yes take permits may be issued when unavoidable for science or research yet this test is redundant therefore avoidable.

This survey is also planned for November when it expects no whales or migratory animals will be near. Humpback whales are often seen in this area in November and early Grey whales are migrating on their way to birthing waters in Mexico. I have seen Grey whales with calves off Montana de Oro in November on several occasions. Elephant seals are also migrating to breeding ground on the Channel Islands during November. Dolphins, porpoises, Harbor seals, California Sea Lions and Sea Otters all inhabit this area year round.

Now I ask you to imagine you are in one of those searain cargo containers and I am outside with a sledge hammer hitting it with all my strength, every 13-15 seconds, 24 hours a day for 32 days.....now imagine the intensity of that times 5. This is what we will be exposing our marine life to.

All this is to what gain? PG&E has extensive knowledge of the fault zones already and it has been admitted by them and many of their own experts that these tests will not show any new information. Currently low level surveys are underway and fish counts are down, marine mammal behavior is being reported as unusual, and sharks have washed up on shore. What will happen at full power?

Please at the very least deny this permit to be revisited after all current data collection is complete and evaluated.

The potential for long term devastation to our marine ecosystem is not worth the risk.

Every other breath you take comes from the ocean and I encourage you to do the right thing and deny this permit.

Sincerely,

Hunter Kilpatrick

**RECEIVED**

SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

**Central Coast District Office**  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

To Whom It May Concern:

I was just informed about PG&E seeking approval for seismic testing on California's Central Coast. Needless to say, I am outraged that PG&E has even proposed such action. The cost to marine life in the area and everywhere is devastating and significantly outweighs any benefit of the testing, which would be minimal. There is no reason why a nuclear plant known to be sitting on earthquake faults should still be in operation. The plant should have been shut down years ago. Regardless, the seismic testing would cause substantial harm to marine life, and that thought is unbearable.

Please deny the permits PG&E is seeking.

Respectfully,

A concerned California citizen

FROM THE DESK OF  
**THE GANGE FAMILY**

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SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

California Coastal Commission

Dan Carl, Deputy Director

725 Front St. Ste 300

Santa Cruz, CA

95060-4508

**We are writing to express our dismay and anger over the decision to allow PG+ E to conduct incredibly dangerous seismic testing off the coast of San Luis Obispo county. The damage and death this will bring to the marine ecosystem will be unprecedented**

**How any governmental agency that is at all conscious of the facts will allow this is beyond our ability to reconcile. We do not wish to see thousands of dead seals, dolphins, endangered whales (!), birds and fish washing up on our shores. This is not necessary for our understanding or the correct way to proceed.**

**FACT: we all know Diablo nuclear power plant was built on fault lines**

**FACT: Nuclear power is extremely dangerous to the planet and everything that lives on it (see Chernobyl, Fukushima, Three Mile Island, etc)**

**FACT: Diablo and PG +E haven't even demonstrated they can deal with spent fuel rods, yet they wish to be relicensed. The plant needs to be taken off line ASAP**

**FACT: if this testing goes forward to prove what everyone already knows THAT DIABLO CANYON NUCLEAR POWER PLANT IS VERY UNSAFE AND ENDANGERS MILLIONS OF PEOPLE AND ANIMALS, then all our fears are correct: only those with corporate**

FROM THE DESK OF  
THE GANGE FAMILY

power and vast sums of money control our destiny. In the end, the Earth will deal with human's folly and we will finally listen to her. Probably too late.

SEISMIC TESTING IS TOO DANGEROUS  
TO PROCEED!!!!

please do whatever you can to stop this insane plan

We (and all the sea creatures) thank you for your efforts

The Gange family

John & Lynndey Gange

3/6 Reid St,  
Ashwood,  
3147,  
Victoria,  
Australia.

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SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

To Mr Dan Carl: Deputy Director,

I am writing to you with grave concern following learning that Pacific Gas & Electric (PG&E) is seeking permits to engage in seismic testing off the Central Coast of California.

I believe that after an informational meeting a proposal has been made for a 240-foot ship to tow a quarter-mile wide array of twenty 250-decibel "air cannons," along a 90-mile stretch of California's Central Coast. The cannons will shoot deafening underwater explosions once every twenty twenty seconds, day and night, for 42 days and nights.

This would be catastrophic and the seismic testing will kill great blue whales, gray whales and others, dolphins, porpoises, seals, sea lions, otters, and fishes. Each and every one of these animals play a vital roll in the ecosystem and to allow the above would be an atrocity and travesty.

In regions where this sort of testing has been done, countless dead marine animals wash ashore for weeks during and after testing, blood dripping from areas such as their eyes, nose, ears or mouth — a sign they have suffered catastrophic internal hemorrhaging.

A 240 dB blast is reportedly like being one foot away from the mouth of a large cannon. For a human, your ears, or what's left of your ears, would probably never stop ringing. Can you Imagine??

Sadly there are so many cruel practices going on in rest of the world all of the mammals ive mentioned above are fighting for survival. We are paving the way for a very sad future for future generations without the wonder of nature to explore. It is great sadness I write this.

In respect of the above I implore you to re-consider and ultimately deny this proposal.

Many thanks

A handwritten signature in black ink, appearing to be 'M. Connolly', written over a horizontal line.

Michelle Connolly

**RECEIVED**

**SEP 25 2012**

CALIFORNIA  
COASTAL COMMISSION

**September 20, 2012**

To The California Coastal Commission

**Greetings Commissioners and Staff:**

I am a life-long commercial fisherman, and I am writing you today to ask that you deny the request for more seismic blasting off the central California coast.

I began my fishing career at age 21 and am still fishing at age 90. I have spent my entire fishing career attempting to promote good stewardship and a sustainable fishery.

In the late 1940's I testified before the California Fish and Game, and was successful in getting the mesh size of trawl nets increased to allow smaller fish to escape. Later we managed to get the trawl fishery moved out to three miles instead of a hard to enforce fathom curve.

In the 1990's I served two terms on the Groundfish Advisory Panel for the Pacific Fisheries Management Council, and two terms on the National Marine Sanctuary Advisory Board, plus ten years on the California Seafood Council.

Last spring, PG & E began seismic work in our fishing area. Since then my fish catch has so declined that I can no longer hire a crew and now fish alone. My trawl permit requires that I have a federal observer aboard for two months a year to verify the amount of bycatch. I have not caught a halibut since June and the bycatch has declined considerably.

I have years of federally mandated fishing records which log the coordinates, dates, times and amounts of each specie caught. Reams of California Fish and Game landing receipts will verify the poundage and dollar amount.

The decrease of late is very obvious. The state and federal governments have set aside no-take and no-fishing zones and marine preserves along our coasts, some in the proposed seismic area.

Since it is well known that sound waves travel faster and further in water, the very ecosystem we are spending millions of dollars to preserve will be impacted by a tax payer subsidized program. The Public Utilities Commission has already granted PG & E a California wide rate hike to pay for this. Sixty-four million dollars now, but who can calculate the long-range costs?

California fishermen are actually fishing by proxy for the seafood consumer. I strongly urge you to deny the permit.

Thank you for allowing me to speak my heart to you.

Sincerely,

Travis O. Evans  
270 Larchmont Dr.  
Arroyo Grande, CA 93420  
(805) 489-6221

P.S. Would it be possible for me to speak at your Oct. meeting?

September 20, 2012

Jody Mulgrew  
359 Henrietta Ave.  
Los Osos, CA 93402

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Commissioners of the California Coastal Commission,

I implore you to deny Pacific Gas and Electric's proposed project for seismic mapping of the coastal waters around Diablo Canyon Nuclear Power Plant.

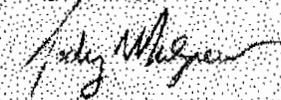
We do not know the full extent to which these seismic tests will harm our Marine Protected Areas and the precious marine life therein.

We do know Seismic testing at Diablo Canyon will entail 260db sub marine sonic blasts that will have a catastrophic effect on whales and other marine life off our coast. These tests will affect the citizens of our state whose livelihoods directly depend upon the health of our oceans and our marine life.

We also know that regardless of the seismic data and scientific results produced by these tests, Pacific Gas and Electric's Diablo Canyon Nuclear Power Plant is already precariously situated on an earthquake fault - No amount of additional seismic data will change this fact.

You have the power to deny this proposed project and require PG&E to develop a plan that respects the law of the State of California, the Marine Life Protection Act, and the living creatures of our Coast that depend upon a healthy marine ecosystem.

Respectfully,



Jody Mulgrew  
Los Osos, CA

To Whom It May Concern,

My name is Jessica Steele-Slevkoff. I live in Fresno California. I am just learning of the State Lands Commission's decision to allow seismic testing off the Central Coast, a project that will kill whales, dolphins, fish and marine life. This just seems absolutely insane. I know that our society has taken its toll on our poor earth but let's not make it worse. We live in a world now that is so concerned with money and greed that we all have lost sight of what really matters. If we kill the ocean we kill ourselves. How can you sit there and think it is ok for someone like PG&E to come in and make such a huge impact on our ocean. This not only affects our ocean but affects all of us, our families and our future. How are future generations going to move forward and live if we kill everything? How is the earth going to survive if we continue down the path we have been leading for years now? We all need to stop and take a hard look in the mirror and think what have i done? What have we as a society done to our home our earth or oceans? I often visit the beach and I Love going and visiting the Monterey Bay Aquarium. It is such an learning experience every time I go there, to see all the thousands of sea life in the ocean. I suggest you go take a trip to the aquarium and remind yourself and everyone from PG&E what is in our oceans. You need to see firsthand ALL the marine life that lives in our ocean. There are so many different types of living animals in our oceans that it is just ridiculous to think that it is ok to come in and kill all of them like PG&E is suggesting. I would like to continue to go and enjoy the ocean as many have done before me and hopefully many will do after me. Please do not let them kill all the thousands of innocent creatures in our ocean.

Thank you,

Jessica Steele-Slevkoff

**RECEIVED**

SEP 20 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Dan Carl,

Please **Do Not** go forward with the approval for PG&E Seismic Testing. You don't realize what you are doing. You are approving this action on the voice of those who are leading you in a direction that could have disastrous implications. How do I know this you ask, well you see I am an empath, clairvoyant and a seer. I have predicted many ecological disasters. Whatever you want to think about me and who I am that is fine, but when you take the lives of animals and the ecosystem into you hand and try to play God, you don't know what you are doing.

Let me just ask you this. If the situation were reverse and you were in a dark room you could not escape from and someone was in charge of the switch that turned on a machine that slowly killed you through seismic brain waves, your eyes and ears started to bleed. You were in this room with your children and family, how then would you feel, as you watch them parish in front of you. I hope you can handle the ramifications of what you are about to do. It has nothing to do with the trails of lies you are believing in, but knowing what is right and what is wrong. This is clearly wrong.

So you say one family of innocent mammals is nothing compared to the whole ocean. Well I guess your family is only one family in the whole world so you don't amount to much. Get the picture.

Please, find it in your heart to stop this action. Live from your heart and stand up for our generations to come. The world is changing for the better. Wouldn't you like to be a part of that? You are human and the world of creatures depends on you for their survival. Don't let them down or the rest of humanity for that matter. I send this email with hope and the courage you will find in your heart to stop the killing. PG&E needs to find a safer alternative to any radioactive energy. Lets group together with our European compadres and find solutions. Answers are always there...you just have to look a little deeper. I will be more then happy to help any corporation "See the LIght", if you will.

Peace and Light  
Debbie Pico  
<http://www.debbiepico.com/>

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SEP 20 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Mr. Bill Denneen  
1040 Cielo Ln.  
Nipomo, CA 93444-9039



Sustainable Living  
Solar & Photovoltaic Panels

No Seismic Testing!

*Bill Denneen*

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SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA



*Sonke Mastrop  
or  
Dan Carl  
CA Coastal Commission  
725 Front St # 300*

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SEP 20 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL EAST AREA

To: **Dept. of Fish and Game: fgc.fgc.ca.gov** attn: Sonke Mastrup  
 cc: **California Coastal Commission, Central Coast District Office**  
 Dan Carl, Deputy Director 725 Front Street, Suite 300  
 Santa Cruz, CA 95060-4508 (831) 427-4863, FAX (831) 427-4877  
 cc: **Senator Sam Blakeslee** senator.blakeslee@senate.ca.gov  
 4066 State Capitol, California 95814 Phone: (916) 651-4015, Fax: (916) 445-8081  
 cc: **Barbara Boxer** at: 202 224-3553  
 cc: **The Honorable Lois Capps**, United States House of Representatives  
 2231 Rayburn House Office Building, Washington, DC 20515-0523  
 DC Phone: (202) 225-3601, FAX: (202) 225-5632

**FORMAL COMMENT : 2pg STOP SEISMIC SOUND TESTING FOR DIABLO CANYON  
 by PG&E**



This is Very Precious..To Me.....To Our Environment...  
 To Our Future.....This is Home to a Multitude of Life...  
 Both Known and Unknown.....food for the masses.  
 This has been changed by  
 Human Waste...  
 Human Misuse....  
 This affects our  
 weather...our Air



These are residents of That Precious Water...  
 These are an important member of the cycle of Life  
 These are Cute to look at.... These Seals Fight for Life Every Day !!



These are Rissos Dolphins whom  
 frequent California Coastal  
 Waters...often seen from Whale Watch Tours  
 Whales are frequenting CA waters in record numbers....  
 partly due to the changing temperatures, ....again our doing!  
 I wish to continue being able to view these Fabulous Creatures and  
 for my Great Grandchildren to also...  
 Do you desire Saving Wildlife?? Have you stood in awe of these ,  
 Natures Creatures....and ....admired their Beauty?

**YOU CAN CHANGE THE DAMAGING EFFECTS OF MAN'S INHUMANITY....VOTE TO FIND BETTER  
 OPTIONS.....VOTE TO STOP SOUND BLASTING  
 ....NOW & FOREVER.....VOTE NO ON OCTOBER 10<sup>th</sup>  
 AND BEYOND !! HAVE YOU SEEN THESE?.....  
 Blasting Causes Bleeding From Eyes ,Ears,  
 Then Death**

**ACCORDING TO THE NATIONAL MARINE  
 FISHERIES SERVICE'S 2007 BIOLOGICAL  
 OPINION "EXPOSURE TO SONAR BLASTS,  
 WHICH MAY REACH 235 DECIBELS AND  
 CAN BE HEARD FOR MILES UNDERWATER,  
 CAN ALSO CAUSE SERIOUS INJURY OR  
 DEATH CAUSED BY TRAUMA TO ACOUSTIC  
 ORGANS, TEMPORARY AND PERMANENT HEARING LOSS, DISPLACEMENT FROM  
 PREFERRED HABITAT, AND DISRUPTION OF FEEDING, BREEDING, NURSING,  
 COMMUNICATION, SENSING AND OTHER**



**BEHAVIORS ESSENTIAL TO SURVIVAL."**

***Stop The Seismic Testing By PGE and Forever!!!***

Joyce Barube

Registered Voter & Caring Human

[Sierrasaver.joyce@gmail.com](mailto:Sierrasaver.joyce@gmail.com)

**"Amazingly, there are currently no accepted international standards regarding noise pollution in our seas."**

- ❖ Many of these beached whales have suffered physical trauma, including bleeding around the brain, ears and other tissues and large bubbles in their organs.
- ❖ These symptoms are akin to a severe case of "the bends" – the illness that can kill scuba divers who surface quickly from deep water. Scientists believe that the mid-frequency sonar blasts may drive certain whales to change their dive patterns in ways their bodies cannot handle, causing debilitating and even fatal injuries.
- ❖ Stranded whales are only the most visible symptom of a problem affecting much larger numbers of marine life. Naval sonar has been shown to disrupt feeding and other vital behavior and to cause a wide range of species to panic and flee. Scientists are concerned about the cumulative effect of all of these impacts on marine animals.
- ❖ **January 2006** At least four beaked whales strand in the Gulf of Almeria, Spain, while sonar exercises take place offshore.
- ❖ **January 2005** At least 34 whales of three species strand along the Outer Banks of North Carolina as Navy sonar training goes on offshore.
- ❖ **July 2004** Four beaked whales strand during naval exercises near the Canary Islands.
- ❖ **July 2004** Approximately 200 melon-headed whales crowd into the shallow waters of Hanalei Bay in Hawaii as a large Navy sonar exercise takes place nearby. Rescuers succeed in directing all but one of the whales back out to sea.
- ❖ **June 2004** As many as six beaked whales strand during a Navy sonar training exercise off Alaska.
- ❖ **May 2003** As many as 11 harbor porpoises beach along the shores of the Haro Strait, Washington State, as the USS Shoup tests its mid-frequency sonar system.
- ❖ **September 2002** At least 14 beaked whales from three different species strand in the Canary Islands during an anti-submarine warfare exercise in the area. Four additional beaked whales strand over the next several days.
- ❖ **May 2000** Three beaked whales strand on the beaches of Madeira during NATO naval exercises near shore.
- ❖ **October 1999** Four beaked whales strand in the U.S. Virgin Islands during Navy maneuvers offshore.
- ❖ **October 1997** At least nine Cuvier's beaked whales strand in the Ionian Sea, with military activity reported in the area.
- ❖ **May 1996** Twelve Cuvier's beaked whales strand on the west coast of Greece as NATO ships sweep the area with low- and mid-frequency active sonar.
- ❖ **October 1989** At least 20 whales of three species strand during naval exercises near the Canary Islands.
- ❖ **December 1991** Two Cuvier's beaked whales strand during naval exercises near the Canary Islands.
- ❖ <http://whalesandmarinefauna.wordpress.com/2012/09/02/whales-die-in-mass-stranding-off-scotland-uk/>



Only 9 of the 29 Beached Pilot Whales were expected to Survive 2012

**STOP SOUND TESTING NOW !!!**

**Stop The Seismic Testing By PGE !!**

Joyce Berube Registered Voter & Caring Human  
[Sierrasaver.joyce@gmail.com](mailto:Sierrasaver.joyce@gmail.com)

RE: PG&E Proposed Seismic Imaging on Central Coastal California

Meeting to be held October 10-12, 2012

Dear Members of the California Coastal Commission:

Below is a statement by a newly formed coalition called the C.O.A.S.T. Alliance. We respectfully ask you to consider our alliance position and make your choices accordingly. Please note the footnote at the end of the statement as it pertains directly to the scope of the Commission's decision.

**Mission:** The C.O.A.S.T. (Citizens Opposing Acoustic Seismic Testing) Alliance, a diverse coalition of individuals, associations and government and non-government organizations is unified in the goal of ending any efforts to permit and undergo high intensity acoustic seismic testing by PG&E in the regions surrounding the Diablo Canyon Power plant on the central coast of California.

**Position Statement:**

In recognition of the significant biological impacts and the resulting negative impacts to our coastal economy, C.O.A.S.T. seeks a cessation to all preparations for offshore acoustic testing now in progress and an end to all plans to engage in high intensity acoustic testing as means for seismic mapping. The Alliance further recognizes that testing new faults is not mandated in AB 1632 and that the only legal mandate is to review and assess existing studies and thereby makes the proposed testing superfluous and not a legal requisite to adhere to the legislation. We insist that the permitting process cease in accordance with the fact that an issuance of the permit would not comply with the Coastal Act, Chapter 3\* and would be in violation of the Endangered Species Act, the Marine Mammal Protection Act, the California MLPA (Marine Life Protection Act), and the Magnusen-Stevens Fisheries Act, as well as several established international marine conservation laws. Further, we insist that the permitting agencies follow the precautionary principle as it relates to biological communities and recognize their responsibility to the human communities involved and to the devastation that the acoustic seismic testing would wreak on the economy of the Central Coast. We understand and agree that mitigation of said impacts by PG&E is an unacceptable option and cannot be construed as a responsible solution to the impacts of high intensity acoustic seismic testing both now and in the future.

\*footnote: article 4 sections 30230, 30234 and 30234.5 appear to be the applicable references in this decision

Thank you for your attention in this matter.

For the Oceans, Mandy Davis – member the C.O.A.S.T. Alliance

*Mandy Davis*

**RECEIVED**

SEP 19 2012

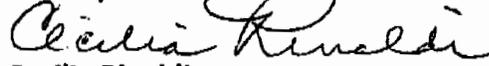
CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, suite 300  
Santa Cruz CA 95060-4508

Dear Mr. Carl:

I am writing to urge you to deny a permit for the underwater seismic testing PG&E is planning. The effects of that blasting will be devastating to the marine life for which California is so well known, especially for the Gray whale population which will surely become extinct with this kind of bombardment. And, as Deputy Director of the California Coastal Commission, you are tasked with the safeguarding of that marine life, not with granting such permits of destruction to PG&E and other corporations. It is on your watch that marine life will be protected by denying that permit. Please—do the right thing for California, its people, and its wildlife.

Thank you.



Cecilia Rinaldi

c\_e\_rinaldi@yahoo.com

Ms. Cassidy Teufel  
California Coastal Commission  
Energy, Ocean Resources and Federal Consistency Division  
45 Fremont St., Suite 2000  
San Francisco, Ca 94105

**R E C E I V E D**

**SEP 21 2012**

CALIFORNIA  
COASTAL COMMISSION

September 18, 2012

*(Ms. Teufel)*

Dear Commissioners:

I strongly object to PG &E's proposed Central Coastal California Seismic Imaging Project. The goal of the project is to attempt to measure the three major earthquake fault-lines which run along our coast. The existence of these fault lines, especially after the continuing disaster at Fukushima Japan, call into question the advisability of maintaining the Diablo Canyon nuclear power facility, operating near Avila. The proposed testing will do nothing to prevent an earthquake on any of these fault lines. The tests will instead produce a large amount of data about dangers that we cannot avoid when these earthquakes occur.

We should redirect the \$60 millions plus that will be spent on these seismic tests to help us move towards safe and sustainable sources of energy.

I have read the environmental impact report for the project. Here is how the EIR describes it:

"The offshore component of the Project would consist of operating a geophysical survey vessel, its associated survey equipment, and support/monitoring vessels . . .The survey would be conducted along the central coast from approximately Cambria to Guadalupe. (including Marine protected areas around Cambria and elsewhere) 18 active air guns . . . would discharge once every 15 to 20 seconds."

In other words, huge underwater canons would blast ear-shattering sounds under the water in an area from Guadalupe to Marin county. (These same measures are used to search for off shore oil reserves—coincidence?)

The environmental impact report indicates these tests would kill or injure marine

mammals, including seals, dolphins, whales, and otters. They could make them go deaf which would mean a lingering death. Already depleted fishing resources would be impacted. Seabirds would be affected as well, with little or no way of mitigating the impacts. Migratory birds would be affected as the tests would go on 24 hours a day and lights at night would be required. Air quality would be impacted and the project would contribute to climate change.

The proposed "mitigation" measures include flying a plane to look for mammals who may be getting in the way and employing a marine biologist to watch as the devastation occurs. I quote again from the Environmental Impact Report:

"The Project would generate potentially significant environmental impacts on air quality, terrestrial and marine biological resources, greenhouse gases (GHGs), land use and recreation, and noise. Impacts to air quality, marine biological resources, and land use and recreation, remain *Significant and Unavoidable* even after all appropriate and feasible mitigation measures are applied. The EIR found *Significant and Unavoidable* impacts to fin, humpback and blue whales resulting from noise. Substantial impact on the Morro Bay stock of the harbor porpoise, is also considered to be significant; based on this threshold, is *Significant and Unavoidable*. Project impacts on sea otters are also considered to be *Significant and Unavoidable* because of the proximity of the survey to sea otter habitat. The Project is also expected to have *Significant and Unavoidable* impacts on air quality and greenhouse gases. Significance thresholds for air pollutants are developed by taking into consideration the levels at which individual project emissions would result in cumulatively considerable impacts. ([www.slc.ca.gov](http://www.slc.ca.gov) "information" tab "CEQA Updates" link)

The ocean is our most precious resource. If the life of the ocean does not matter then neither do our lives. Some few persons stand to make lots of money from this outrageous project. P.G.& E will pass on the costs to us, the consumers. We and all life in the ocean and the land around us stand to lose. And for what? The project will not prevent the next earthquake. And if it happens and Daiblo crashes, so do we. Think of the economic impact of such a disaster. A recent issue of *The Economist* has on its front cover a statement that says the dream of nuclear power has become a nightmare. It is time to put our resources into safe energy and abandon nuclear power.

The proposed tests will damage our environment, destroy marine life and to no good purpose. Please do not approve these tests.

Sincerely,  
Valerie Bentz, Ph.D.  
1855 Cardiff Dr.

Carlsbad CA, 93428



9/18/12

To California Coastal Commission  
Central Coast District Office  
Dan Carl Deputy Director  
725 Front St. Suite 300  
Santa Cruz, Ca 95060

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SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

From  
Michele Masvidal-Penzel  
705 Sierra Ct  
Morro Bay, Ca 93442

I want to express my extreme opposition to the seismic testing at the Diablo nuclear power plant. I can't believe that this was passed and your all ok with this. This is such a farce that will cost more then money. You are really not listening to the people who will have to pay for this. The scientists who will do the testing they think that this will yield valuable information regarding the faults that are there. Well really now, why didn't you think about the faults before you built the nuclear power plant? What if you do find a huge fault? What will the game plan be? Mother nature always out smarts you anyway! When the big earthquake comes this information will be useless and at such cost to the marine life. I don't want to see dead animals on the beach for nothing.

Michele Masvidal-Penzel

M. E. PAGE, M.D.  
MARIA V. PAGE, R.N.  
836 CYPRESS RIDGE PKWY.  
ARROYO GRANDE, CA 93420

September 18, 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front St., Suite 300  
Santa Cruz, CA 95060-4508

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SEP 18 2012

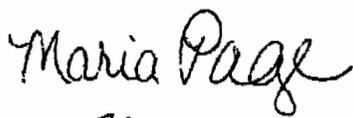
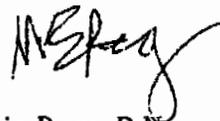
CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Mr. Carl,

Please put a stop to the Diablo Canyon Seismic Testing Plan! Our marine life in our coastal waters will be devastated by this unnecessary and extremely risky project, and thus our own human lives will be affected, if we choose to continue down this path of destruction. Our tax dollars should not be paying for this type of project that will only do harm to our delicate ecosystem, which is already being challenged by so many other of our careless human processes.

Thank you for your consideration.

With sincerest regards,

Maria Page, R.N.  
and  
Mike Page, M.D.

Steve and Cindy Fear  
317 E. Cherry Ave.  
Arroyo Grande Ca 93420

To: Deputy Director Dan Carl  
CA Coastal Commission  
725 Front Street #300  
Santa Cruz, CA 95060

Dear Deputy Director Dan Carl,

Please help us stop the upcoming seismic testing for PG&E Diablo Canyon Nuclear Power Plant. The proposed loss of marine life is far too great. The Central Coast of California is fortunate to be blessed with such a large, diverse, and unique population of marine life. We are stewards responsible for caring and protecting the living creatures within our area. It is truly our most valuable resource. Our area is already seeing loss of life with the lower level testing currently going on. The thought of blasting loud, high decibel sound waves in an area known to be populated with highly intelligent mammals that rely on sonar for their survival and dooming them to a sure death whether instant or prolonged is extremely inhumane. Please stand up for the protection of our irreplaceable marine population.

Sincerely,

  
Steve Fear

9-18-2012

  
Cindy Fear

9/18/2012

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SEP 21 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

M-673  
MORRO BAY, CALIFORNIA

Photo by George Donovan  
Printed in Korea



To Whom it may concern:

Please help the concerned citizens of the Central Coast stop seismic testing in the ocean surrounding Diablo Canyon Nuclear Power Plant. It is scheduled for this November and is estimated to kill more than 4,000 dolphins, 1,000 sea lions, and 1,000 sea otters.

Smith Novelty Company  
460 Ninth St., San Francisco, California

SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST REAR

Dan Carl, Deputy Director

725 Front St. Suite 300

Santa Cruz, CA 95060-4508

Thank you so much.

Marty Tacker 1188 4th St  
Los Osos CA 93402

Dear *Dan Carl,*

I am writing this letter because I am expressing some concern over an urgent matter. Seismic testing off the waters of the central coast is scheduled to be conducted for the months of October/November 2012. The state of California has required Diablo Canyon to complete these test in order to get another 20 year license re-newal to continue to run the nuclear power plant. Seismic testing poses a threat to our sea life, from plankton to blue whales and every living thing in between. This ocean is part of my home here, where I was born and raised. I oppose this testing. There are better ways to look for "faults" that run under the power plant. There is technology in satellite mapping that will not touch the environment. I feel lied to by the state and by PG&E. I highly suspect that this seismic study is to find oil. I believe that progress should be made towards creating green energy. I don't believe that this will happen overnight, but progress does need to be made. If I were to choose between nuclear power and oil, I would chose the latter even though it also risk the sea life. I find oil to be the lesser of two evils in the long run. Our cherished way of life here will change drastically if the seismic testing is to be continued. As I write this so far, we have already had a salmon shark, California sea lion and a few thresher sharks wash ashore right in the vicinity of the Pacific Star, which is now doing "low level" blast to "scare away" sea life and warn them of the 250+ decibels that are coming soon to drive them away from THEIR HOME, and possibly kill them. How am I supposed to look into my child's eyes someday and explain this huge tragedy that will go down in history as one of the greediest, most evil plans to keep using cheap nuclear power? I am pleading with the state of California to not allow this seismic study to move forward, and to look into other means to create electricity for population. Green energy is a win/win situation. Seismic studies to keep an aging power plant in operations is a lose/lose strategy. Thank you for your time.

Signed,

*Allison King*

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CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Jill Finch  
151 Cypress  
Cayucos, CA 93430

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SEP 17 2012

To: Dan Carl, Deputy Director  
CA Coastal Commission

Fax: (831) 427-4877

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

From: Jill Finch

Date: 9/17/2012

Re: Stop PG&E Seismic Testing Plan

Pages: 1



Urgent     For Review     Please Comment     Please Reply     Please Recycle

...our part in preventing the likely destruction to Marine Life by stopping PG&E's plans to  
...orm the seismic testing of the waters outside of Diablo Nuclear Plant at Point Buchon.  
...potential death & destruction to Mammals, sea organisms & the delicate balance of the ecosystem  
off our coasts is not worth the minimally helpful information that might be gained.

As a concerned citizen, I ask that my families' voice be heard & thank you for your help.

805.776.3363

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
(831) 427-4863  
FAX (831) 427-4877

Dear Commissioners,

I am writing to address the proposed HESS to be conducted for PG&E near Diablo Canyon in San Luis Obispo County. I encourage you to not approve any permitting for this survey. The cost to our marine life will be devastating. This survey will take place within three Marine Protected areas, adjacent to a National Marine Sanctuary, adjacent to a National Estuary and in an area of our ocean inhabited and used for migratory routes by thousands of marine mammals.

The Marine Mammal Protection Act prohibits harassment of any kind to marine mammals, this harassment or "take" includes the altering of normal behavior. The EIR on this project asks for a take permit to allow possible level A take (table 4.4-14) of thousands of marine mammals. Level B take estimates (table 4.4-15) list nearly 5000 individuals that are expected to be harassed or killed.

The survey proposes to mitigate take with observers, aerial and on deck, yet will operate 24 hours a day. I am doubtful that these observers will find any animals at night while the blasts are continuing. Mitigation is also planned by "ramping up" to chase animals away. Chasing marine mammals from their normal behavior and waters is harassment and in violation of federal law. Additionally, some whales are known to move towards the sound, not away.

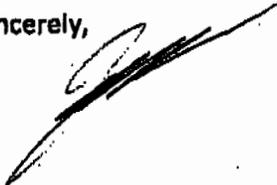
This survey is planned for November when it expects no whales or migratory animals will be near. Humpback whales are often seen in this area in November and early Grey whales are migrating on their way to birthing waters in Mexico. Elephant seals are also migrating to breeding ground on the Channel Islands during November. Dolphins, porpoises, Harbor seals, California Sea Lions and sea otters all inhabit this area year round.

There is already extensive knowledge of the fault zones and it has been admitted by PGE and many of their own experts that these tests will not show any new information.

Currently low level surveys are underway and fish counts are down, marine mammal behavior is being reported as unusual, and sharks have washed up on shore. What will happen at full power?

Please deny this permit to be revisited after all current data collection is complete and evaluated. The potential for long term devastation to our marine ecosystem is not worth the risk.

Sincerely,



California Coastal Commission Office  
 Central Coast Division  
 Dan Carl, Deputy Director  
 FAX 831-427-4877

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 SEP 17 2012  
 CALIFORNIA  
 COASTAL COMMISSION  
 CENTRAL COAST AREA

My name is Glenn Knowles and I am a long term resident of San Luis Obispo. I write this letter to inform you and the Coastal Commission that I very much oppose granting PG&E a permit for seismic testing of any kind in our off shore waters. It is simply not necessary and far to costly and based on flawed logic. It is not in the public's interest and it will not make the Diablo Canyon Nuclear Power plant any safer. No seismic testing!

Sincerely,  


1079 GOLDENROD LANE

San Luis Obispo, California

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dawn Pillsbury  
1601 Bridge Ave.  
Oakland, CA 94601

Dear Mr. Carl,

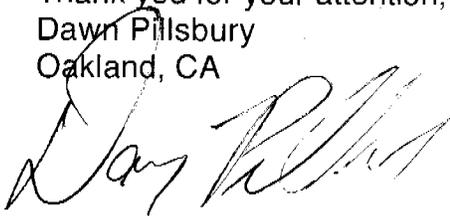
I am outraged to learn that the Commission is considering granting PG&E permission to conduct seismic testing on the Central California Coast. As your organization must be aware, the ecology along the California coast is sensitive, as well as enjoying an upwelling that has brought thousands of marine mammals to our shores. Conducting this testing at all is irresponsible. Doing it now borders on psychopathy.

As far as allowing an organization with PG&E's record for discounting human life for the sake of their bottom line to conduct this testing - well, their record stands for itself. I don't think they will be any more tender for the welfare of the citizens of our coastal waters than they were for the welfare of the citizens of San Bruno.

As a worker in the energy industry, I feel that it would be better to shut down Diablo Canyon entirely and import power - coal-fired if necessary, than to allow this seismic testing. The additional cost and carbon footprint is well worth the welfare of our marine life, upon which our tourism and fishing industries depend so completely.

Please, stop this madness. Do not allow PG&E to conduct any seismic testing off the California coast. You know your duty.

Thank you for your attention,  
Dawn Pillsbury  
Oakland, CA



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SEP 17 2012

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COASTAL COMMISSION

Dear Coastal Commission

I am seckened by the so-called seismic testing!

My family moved to this area of San Luis Obispo County in 1961 from Hawaii because of the beauty and similarities to Hawaii. NOW, I ask why?

How can this SEISMIC testing be done in our paradise?

Please dont approve this. I was blessed enough to see the whales and dolphins a few weeks ago. A sight I will never FORGET.

But when I go to the ocean I dont want to see the death seismic testing will creat! P&E doesnt even know what is going to happen

Dont allow us to be their

gunny dogs - and defenately dont let them kill the beauty we have surrounding us!

Thank Boyd

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

29-12

Dear Coastal Commission

Why do we live here? Our choice for small, quiet rural area, TO enjoy the beauty GOD gave us!

In the past 2 weeks, I have enjoyed going TO see the whales, dolphins, seals & pelicans - what I saw at Port Beach was a picture I would display on my wall. Total beauty! Like sea paradise.

The plan of seismic testing for Diablo breaks my heart, as well as disgust in my belly.

This is not only detrimental to our wild life. It will kill, well who really knows, many marine mammals, to include entire species!

All for what? A possible earthquake that, no doubt, will happen due to placement of Diablo Canyon.

I'd like to know how PG&E employees sleep at night with the premeditated plan on their hands!

I say 'NO' to seismic testing!  
Anneberly Cattanes

P. 1 of 3

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Dan Carl, Deputy Director

725 Front St, #300

Santa Cruz, CA 95060-4508

SEP 26 2012 9-17-12

CALIFORNIA  
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CENTRAL COAST AREA



"All the arguments to prove man's superiority cannot shatter this hard fact: in suffering the animals are our equals."  
- Peter Singer

Please stop the scheduled Diablo Seismic testing for several vital reasons. There's an historic number of whales now present in the seismic testing site...inflicting damage or death on the area's innocent and vital sea creatures and their critical habitat...any testing that might in any way activate or contribute to a seismic event not only is crazy, but terrifying to a native Californian like me who has endured major San Francisco and Los Angeles earthquakes.

Please direct this assigned money (ultimately paid for by us...the general public) toward positive, alternative, environmentally benign, and cost effective energy solutions such as solar.

I beg you to stop this insanity, damage from which will be irreversible.

Most sincerely,

Judith Parksdifranco + NEIGHBORS

100 Jennifer Court

Grover Beach, CA 93433

William T. Olson  
101 Janet Ave  
Grover Beach Ca.

Cheryl Olson

Pat Mabeat,  
111 Janet  
Grover Beach, Ca

Dan Andriyko  
141 Janet  
Grover Beach CA 93433

Diane Zdenberg  
231 Janet Ave

KAY SHRODE - Kay Shrode  
136 Rebecca - Grover Beach,

Pat Linn  
113 Rebecca St. Grover

Kaye Minton  
100 Rebecca St, Grover Beach, CA 93433

Adele Borden  
131 Janet Ave  
Grover Beach, Ca

L. Rosner  
201 Janet Ave.  
G. Beach CA 93433

Rachel Mung

Molly Alexander  
201 Janet Ave

Joan McMillan 100 SHANNA PL., GB  
William R. Philip 131 " "

Donna Bloyd 130 Shanna Pl GB  
Rudy Mc Intosh 160 Shanna Pl.

Robert Bolt 181 Shanna Pl.

SHIRLEY ATKINSON 151 SHANNA

Jim A. Edkins 111 Shanna Pl. Grover Beach

Virginia Pittipot 101 Shanna Pl. G.B.

Deis Bonadjemi 148 Rebecca St Grover Beach

Dawn Penner 158 Rebecca St GB

Jake Beaver 162 Rebecca St GB

Leah Lopez 295 ANITA GB

Madeline E Friedlander 281 ANITA GB

MINN FURUWALL 281 ANITA AVE GB CA

DEBBIE RICE 290 Anita Ave GB

Debra Boring 260 Anita Ave GB CA

Paula Burke 270 Anita Ave GB

Jon Nell 250 Anita Ave GB

Marion Cleb 230 Anita GB

Theresa Beach 220 ANITA GB

Dorothy K. Alhettson 210 ANITA AVE G.B.

Jim the Miller 200 ANITA AVE G.P.

P. 3 of 3

Linda Rider 190 Anita Ave., Grover Beach, CA

MARTY HORTON 190 Anita Ave., Grover Beach, Ca.

Bob Selders 190 Anita, Grover Beach, CA

Margie Slayman 121 " " " "

Shirley Ward 110 Anita Ave., Grover Beach, CA 93433

MITCHEL RAY WILLIAMS 100 ANITA AVE. GROVER BEACH, CA. 93433

~~Estelle~~ Estelle 175 Lynne St GB 93433

 Michael 111 Jennifer GB 93433  
Messenheimer

Paulita Munkin 111 Jennifer Ct. GB 93433

Lucinda Bryant 160 Jennifer G.B. 93433

Svetlana Paulson 307 McCarthy Ave. Oceano 93445

Janeie Johnston 2300 Curacao Oceano 93445

~~Frank~~ Frank 758 La Brea Bonita

Pat Hitzel 3565 Elm St Apt 21  
A. S. Ca 93420

# PROPOSED PBTÉ Seismic TESTING

Is it safe?

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION

As a concerned citizen and  
resident on the coast I have concerns  
about the proposed plan to test and  
the unknowns that exist with such an  
undertaking. It is not at all clear  
that the true costs of the study  
would be known. I question the  
potential damage to the environment.  
My main concern is that this area  
is a marine protected area and  
that PBTÉ's canons are listed AT 250 LB  
A 1980's outdoor concert with 10  
separate stacks of speakers Amped  
up to 40,000 watts could only  
produce a sound level of 162 db  
(160 decibels can instantly perforate  
your eardrums).

Since the decibel scale is logarithmic  
each increase of 10 db is 10 times  
greater than the number before  
while a 20 db increase is  
100 times that level of sound.  
Source: what are decibels

P6+E's canons are at 250db  
could this really be many times  
greater than the sound of a  
nuclear blast - yes - Do the math  
and ask is this safe to be  
doing in front of a nuclear plant  
and above earthquake faults,  
we don't know what this might  
create other than many dead  
sea animals.

There are too many  
unanswered questions to approve  
this project. cordially,

**Carolyn Adams**

---

**From:** cadams@rockcliff.com  
**Sent:** Sunday, September 16, 2012 2:22 AM  
**To:** fgc@fgc.ca.gov; senator.blakeslee@senate.ca.gov  
**Cc:** info@seashepherd.org  
**Subject:** DIABLO CANYON TESTING!

I am writing to voice my concern for the underwater testing that PG&E is requesting permission to perform off the coast of California in order to map the underwater faults. I have lived in California for 41 years now, I was lucky enough to be born in this beautiful state. I have visited the coastline many times each year since I was born. Spending time in the counties of Monterey, Santa Cruz, San Mateo, Mendocino and, my personal favorite, Sonoma County.

It is ironic that I read this story on the Sea Shepherd website this evening because I just spent a chilly yet beautifully sunny day at Goat Rock which is part of the Sonoma Coast State Beach. Today I was blessed to be in the right place at the right time and for the first time in my life I saw a small whale swimming in the cove. It isn't coincidence that whales are suddenly in this area, they are here to feed on an abundance of krill in this area.

Another ironic event that happened today is that I stopped at Bodega Head where I stood at the edge of the wooden pier that allows the public to view what is now referred to as "The hole in the Head." This is the remnant of PG&E's failed attempt to build a nuclear plant on Bodega Head in the 1950's ON San Andrea's Fault. If it wasn't for the fight of one female rancher who didn't want to see her land in PG&E's hands they would have built the plant directly on top of the fault!

I am often disappointed in the Human attitude that we are more important than the other life forms on this planet! We are supposed to be the most intelligent life forms on Earth, so why do we feel like the sea life in this area is expendable in order to map faults that we are all to aware of already! There is no secret that California and the entire Pacific Ring of Fire is the result of the tectonic plates that have existed far longer than humans have walked the Earth.

Diablo Canyon is already here. It is located near known faults. These tests should have been requested PRIOR to building Diablo Canyon. If they had been I am confident that I would be able to stand on a wooden pier and overlook the remnants of what should have been PG&E's failed attempt to build Diablo Canyon. There is NO benefit to PG&E's knowing exactly where the faults are now, as they can't move the plant from it's present location and I am certain their motivation is not to shut down the plant! A catastrophic earthquake on one of the faults near Diablo Canyon will not be avoided by simply mapping the faults. If we learned anything from Japan's devastating tsunami, it should be that we cannot control earthquakes and we surely cannot control the sea. Nuclear plants should not exist in California period. It doesn't take any testing at all to know we have earthquakes, you just have to have attended elementary school in order to know that.

The only purpose that these tests will serve would be harming, deafening and killing the fish and wildlife in the area. This will include whales and dolphins who are capable of feeling pain and feel loss and grieve just as we do when they lose a member of their social sphere. Whales, in specific, are social mammals and they should be protected as the highest level of the food chain in the ocean.

Between the huge trash heap in the Pacific and the radiation and debris from the Japanese Tsunami and the threat of poachers and overfishing, the sea life doesn't need any other threats to their lives. They have enough to worry about as a result of sharing the Earth with us, the most intelligent life forms.

PG&E should be ashamed of themselves for even requesting these tests and I ask that you consider the sea life first as they are not able to attend your public hearings on this matter and speak on their own behalf. I'm certain that if they could speak at your hearing, their words would be few. "Please don't kill us with your tests."

Thank you for your time and for the opportunity to voice my concerns as a life long Californian who discovered that the whale population is finally recovering in the Pacific because I finally saw a whale in it's natural habitat TODAY. Thank you Sea Shepherd for posting this story for me to read.

Sincerely,  
Carolyn L. Adams  
Realtor  
Resident of Pittsburg, California, Contra Costa County

- Sent from my HP TouchPad

Dear Coastal Commission,

19-16-12

The Diablo Cove Fault, which runs directly under the Unit 1 reactor and for inexplicable reasons is not currently in the scope of the seismic studies.

Mothers for Peace asserts that there is adequate time to explore other technologies as the current operating license for the two reactors at Diablo Canyon are valid until 2024 and 2025 respectively. I work for State Parks, on the beach, as a public servant, and get ask many questions from a whole array of groups and individuals as I am in uniform, doing my maintenance rounds, here on the central coast and so far the consensus of seismic testing with loud blasts is no. Bloom box is a yes alternative for Google, Walmart, Fed Ex, their choice, of alternative fuel cell energy, fuel cells made from beach sand, so clean. Let's get on track with it, and stop the double evil of spent fuel rods, we don't know what to do with for sure and the deaf death method of a map measurement in 3-D.

Trust the process,  
Janet M. Anderson

## **Public Comment to the California Coastal Commission**

September 14, 2012

David Gurney

According to the Nuclear Energy Institute, as of 2011, California as a state has 2,930 metric tons of spent fuel in storage. In normal operations, Diablo Canyon and San Onofre each produce about 20 metric tons of highly radioactive spent fuel rods per year. That's over 44,000 pounds each year, of spent highly radioactive fuel rod assemblies, that are being stored on site in so-called "cooling ponds" for at least five years, until they are cool enough to be transferred to "dry-cask" storage. These "cooling ponds" are 40-foot deep concrete tanks that are extremely vulnerable to natural disaster and terrorists attack. The "dry-casks" - where the fuel rods are eventually "permanently" stored, also on site, are huge concrete canisters that the nuclear industry says are viable for 150 years. Never mind that these highly radioactive wastes remain dangerous for well over 150 thousand years.

Fukushima has shown us what nature can do to disrupt the well-meaning plans of engineers to safely store spent atomic fuel in earthquake prone coastal sites along the Pacific "Ring of Fire." The Japanese people will be having to cope with a permanently ruined part of their country and ocean, on a beautiful stretch of their coastline. This is in an ongoing catastrophe that still, over a year and a half later, is very far from being resolved.

Meanwhile, PG&E has proposed to conduct high-energy seismic surveys, including within the Point Bushon marine protected area, to look for already known earthquake faults. As I'm sure you are aware, a large groundswell of local opposition has formed, and more

information is available on the Facebook page: ***Stop the Diablo Canyon Seismic Testing***. The Facebook page now has over twelve hundred "friends." A ***www.Change.org*** petition website has so far garnered over 3,000 signatures.

I feel that the greatest immediate threat to our beautiful California coast right now, is the Diablo Canyon seismic testing by PG&E, that will kill or harm all marine life within a many square-mile area off Central California coast.

Beyond this immediate threat, I feel the Coastal Commission needs to begin addressing the very real threats that these ill-placed nuclear power plants pose to the people and natural world. Plans for shutting down both the Diablo Canyon and the San Onofre nuclear power plants need to begin now, before a natural or man made disaster makes it too late to safely decommission them.

Please do not let PG&E have permits to engage in seismic testing off the central coast of California at Point Buchon State Marine Reserve. I am strongly opposed to this horrible testing that will kill thousands of marine animals.

Robin Citrin Cummins  
224 Kingsbury Dr.  
Aptos, Ca 95003  
831-688-4295

Dear Coastal Commission 9/13/12

I was born and raised in San Luis Obispo. I choose to raise my family here, too.

I am a fisherman, by hobby fishing from the piers. I surf crab. I utilize Virg's fishing when I can.

I'd like to be able to bring my daughter up in the same fashion respecting nature.

This blatant attack on coastal waters by PG & E's potential seismic testing is ludicrous.

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CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Any person/person knowingly and outright killing sea mammals would be jailed and fined.

This is a blatant abuse of power & money. Who is PG & E paying off for this absurdity?

I want my daughter to enjoy our wild life with a passion - as myself.

Please do NOT allow seismic TESTING HAPPEN! Tony Marks

**TERRY HAYES**

347 Vetter Lane  
Arroyo Grande, CA.  
Phone (805) 801-3925  
Fax (805) 4730831  
thayes.edbino@earthlink.net

September 13, 2012

Deputy Director, Dan Carl  
725 Front Street, Suite 300  
Santa Cruz, CA. 95060-4508

Dear Sir,

I am contacting you in regard to the proposed seismic testing on our local coast by P.G. & E. for the continued operation of Diablo Canyon nuclear power plant. We locals are adamantly opposed to this action, as it will have no positive effect for the projected 64 million dollars it is supposed to cost. It will not prevent or diminish the catastrophic damage which could be the result of a seismic event. Nor would it minimize the danger posed by the poisonous waste being generated at that plant each and every day. It would have no positive effect on the cost we taxpayers will be charged for the storage and protection of all that hazardous waste from terrorists. In fact these costs will escalate enormously as we continue to produce more and more extremely deadly waste day after day. These costs will be the responsibility of us taxpayers, not the utility. The utility will walk away counting their money as we clean up their mess. At best, this mapping may show details of seismic faults under and around the nuclear plant which are already known to exist. This information may likely be manipulated to appear of less concern, so as to downplay the negative impact. Thus allowing P.G. & E. to push thru re-licensing of the nuclear power plant for another 40 years. This would be the pay off for jeopardizing the health of the marine life along our coastline. The negative effects to our local tourism, fishing and related businesses in our area should be enough to prevent this ill conceived plan. The possibility of such catastrophic death and destruction to our coastal wildlife is quite literally unconscionable. It is your charge to protect our coastal treasures, not permit them to be destroyed. I thought the coast and marine life were protected against destructive actions. The wildlife in our oceans belong to us all, not the few with money and power. The potential of such death and destruction is unacceptable. The discussion, as someone else so eloquently put it, should be how best to decommission, dismantle and dispose of Diablo Canyon nuclear power plant and its associated waste. Instead of pouring more money into this costly and dangerous form of power generation, more funding should be directed to emerging clean energy technologies. Please do not allow this proposed destruction to devastate our coastline. I'm sure your family will thank you for stopping this travesty, I know mine will.

Thank you

Terry Hayes



Deputy Director Dan Carl  
Central Coast District Office  
California Coastal Commission  
725 Front St, Suite 300  
Santa Cruz, CA 95060-4508  
Sent via fax: 831/427-4877

Sept. 13, 2012

RE: PG&E seeking approval for Seismic Testing on California Central Coast

To the Honorable Dan Carl:

As a 30-plus-year resident in California, many in coastal cities, I write with alarm about the PG&E proposal for the Diablo Canyon seismic testing.

Twenty, 250 decibel air cannons will blast every 20 seconds for 42 days and nights along a 90-mile stretch of California's Central Coast.

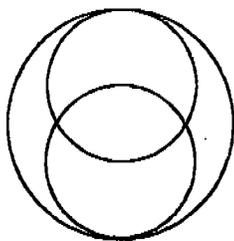
Per the Environmental Impact Report, nothing of this scope has ever been done in California waters before and the toll on marine life from this kind of testing is staggering. The impact on marine life is both a negative impact on California's economy and its critical natural resources.

We urge the Commission to deny the PG&E proposal. Please stop the Diablo Canyon seismic testing.

Respectfully,



The McDonald Family  
5 Northern Shadows Lane  
Sedona, AZ 86336

**RECEIVED**

SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREAAlexandra Kennedy, M.A.  
LICENSED MARRIAGE AND FAMILY THERAPIST

CA Coastal Commission

To: Central Coast District Office  
Dow Corl

427-4877

I urge the commission to block the testing P6 + E is proposing off Point Buchan State Marine Reserve. This is likely to wipe out thousands of marine animals. It is an ill-conceived plan - occurring at a time when humpback & blue whales appear along the CA coast to feed on krill.

Please stop the P6 + E testing!

Sincerely,

PG&E Seeking Approval for Seismic Testing on California's  
Central Coast

Deafening Assault Is Likely to Wipe Out Thousands of Marine  
Animals, Including Virtually Every Living Being in Point Buchon  
State Marine Reserve

**PLEASE DO NOT PERMIT THIS TO HAPPEN!!**



Beth Olson

a frequent visitor to the central coast

4480 N. Academy

Sanger CA

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SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Jacqueline Dale  
160 Keonekai Rd, #2-201  
Kihei, HI 96753  
lola\_dale@hotmail.com

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

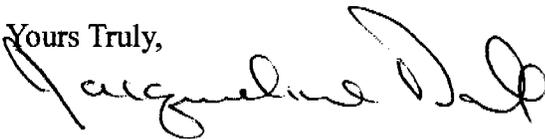
September 12, 2012

RE: Seismic testing by PG&E

Dear Deputy Director Carl,

I am writing to urge you to deny PG&E the permit to conduct Seismic testing on California's Central Coast this November and December. The research I have read from various agencies and organizations gives every reason to believe that this will be dangerous and most likely deadly to marine life who live in or regularly use this area. It is unbelievable that such a destructive type of testing would be allowed in and around the Point Buchon State Marine Reserve – an area considered “protected” and inhabited by whales, dolphins, seals, sea lions, otters, porpoises and fish. The risk to these creatures is just too great to allow such testing.

Yours Truly,



Jacqueline Dale

cc: Sonke Mastrup, California Fish and Game Commission [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)  
Senator Sam Blakeslee [senator.blakeslee@senate.ca.gov](mailto:senator.blakeslee@senate.ca.gov)  
Congresswoman Lois Capps, US House of Representatives

September 12, 2012

VIA FACSIMILE - (831) 427-4877; (916) 558-3160

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SEP 12 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Directors,

Recent findings have put the Diablo Canyon Power Plant in a dubious position. This nuclear power plant rests along the California coast in Avila Beach of San Luis Obispo County. While this makes the power plant's location picturesque, it also makes it truly vulnerable to tectonic activity. Because of this, Pacific Gas and Electric Co. is planning on conducting a reckless program of seismic underwater testing.

This testing stems from poor initial planning, as the plant was built in 1968 at the mouth of a coastal canyon. Improper surveying at the time failed to reveal that this coastal canyon rested directly above a then unknown fault line, the Hosgri Fault. To add to the concern, another previously unknown fault line was recently found to run perpendicular to the Hosgri Fault, this new one running along the shoreline of the region.

Pacific Gas & Electric Co., upon discovering this, began to conduct plans to utilize seismic testing methods in order to generate a three-dimensional map of the shoreline fault's deeper regions. This process will be done by firing high-energy air guns which are dragged in an array behind a research vessel. Hydrophones placed in the water and geophones on the sea floor are then used to collect data on the sound as it resonates through the water and ocean floor.

This testing has proven to radically alter behavior in cetaceans (whales, dolphins, and porpoises), causing them to alter migration and breeding patterns to avoid these sound sources. This disruption also impacts the safety of these animals. The inquisitive nature of many dolphin species makes them especially vulnerable as they have a tendency to approach research vessels, sometimes bringing them directly in front of these air cannons as they are firing.

Pacific Gas and Electric must not be allowed to continue with these plans. The habitats of these oceanic mammals must be respected by forcing Pacific Gas and Electric to cancel their plans to conduct seismic surveying. These animals should not be punished for the poor placement of their power plant.

As a California resident, I am horrified by the thought that this testing would be allowed to take place. Please let my voice be heard for the marine life. I am against this 100%.

Rosalind Goodfellow  
1338 N Brighton St.  
Burbank, CA 91506

CC: Governor Jerry Brown



# faxZERO

Send a fax for free

#### Recipient Information

**To: Central Coast District Office**  
Fax #: 8314274877

#### Sender Information

**From: J Perrone**  
Email address: [josperrone@gmail.com](mailto:josperrone@gmail.com)  
Sent on: Wednesday, September 12 2012 at 11:42 AM EDT

**As a California resident, I oppose seismic testing on the central coast for PG&E!!** This deafening assault is likely to wipe out thousands of marine animals, including virtually every living being in Point Buchon State Marine Reserve. Experts say that for sea life, beyond just broken eardrums, the transfer of low-frequency shock waves from water-air-water causes hemorrhaging of lungs and air-sacks, and will result in the death of marine mammals – whales, dolphins, seals, sea lions and otters – and fish.

Save ink and paper – receive your faxes via email next time: [www.GoodbyeFaxMachine.com](http://www.GoodbyeFaxMachine.com).

This fax was sent using the FaxZero.com free fax service. FaxZero.com has a zero tolerance policy for abuse and junk faxes. If this fax is spam or abusive, please e-mail [support@faxzero.com](mailto:support@faxzero.com) or send a fax to 800-980-6858. Specify fax #7648060. We will add your fax number to the block list.

Dear Coastal Commission:

I am writing you regarding the proposed seismic testing scheduled to be performed off our central coast November 1, 2012. I am horrified that this is even being considered. Considerable damage to our "protected" marine life is estimated. Reports from other areas where they have mapped are of horrific destruction of wildlife.

At a time when our food production is challenged by inclement weather patterns, i.e. drought, do you really think it's a good idea to destroy or in any way harm our ocean? We will be needing food from our oceans. Food from our land will become more scarce as climate change escalates.

Please reconsider this proposal. It will not only hurt future food sources but damage our economy even further. I am also outraged because this was a "protected" area for our marine wildlife and I consider the wholesale slaughter of countless animals for questionable purposes, NOT ACCEPTABLE.

Please DO NOT sanction this activity. It is extremely destructive at a time when we need all our resources intact.

Sincerely



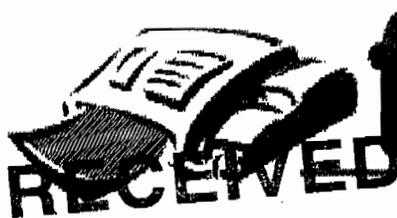
Karen R. Archer-Hutchison

Santa Barbara County (805)944-8324

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CALIFORNIA  
COASTAL COMMISSION



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SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

**Recipient Information**

**To: Dan Carl, Deputy Director**  
Company: Central Coast District Office  
Fax #: 8314274877

**Sender Information**

**From: Emily Breslin**  
Email address: emily\_breslin92@msn.com  
Sent on: Wednesday, September 12 2012 at 4:29 AM EDT

Dear Dan Carl,

My name is Emily Breslin and I live in Melbourne Australia. I am very concerned about the Seismic Testing on California's Coast. I believe this is a very unnecessary procedure which is going to do a lot more harm than good. How can you allow this to go on when you know the damage it is going to do to all of the marine life? These innocent animals do not deserve to die a cruel death. It is your responsibility to stop them, please don't let us down. I may live far away but I live on a beach in Melbourne, the ocean has always been a very big part of my life and I will do everything I can to protect it. Please stop this inhumane project. Thousands of marine animals' lives depend on you. Please make sure PG&E do not get approval.

Thankyou, Emily Breslin

Save ink and paper – receive your faxes via email next time: [www.GoodbyeFaxMachine.com](http://www.GoodbyeFaxMachine.com).

This fax was sent using the FaxZero.com free fax service. FaxZero.com has a zero tolerance policy for abuse and junk faxes. If this fax is spam or abusive, please e-mail [support@faxzero.com](mailto:support@faxzero.com) or send a fax to 800-980-6858. Specify fax #7646200. We will add your fax number to the block list.

Sept. 17, 12

To whomever this concerns  
I am appealing to help  
stop the seismic testing proposed  
in Pt. Buchon State Marine  
Reserve.

The animals can't make their  
voices heard, so we have to speak  
up for them.

The proposal calls for a 240 ft. ship  
to tow an array of "air cannons" along  
a 90 mile stretch. The cannons shoot  
deafening underwater explosions  
every few seconds for 42 days.

"I have heard that these underwater blasts  
will be the volume of a shock wave  
instantly deafening, maiming and  
killing everything in its path."

Please Help Stop these  
unconscious acts.

Thank you

Rutha Sheper

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Sept. 12, 12

To the Calif. Coastal Commission

I am appealing to you to help stop the seismic testing proposed at Pt. Buchon State Park Marine Reserve.

It is so destructive to the life below the sea, which affects the life above.

The proposal calls for explosive blasts every few seconds for 42 days.

"I have heard that these underwater blasts will be the volume of a shock wave constantly deafening, maiming and killing everything in its path"

Please help stop these senseless acts proposed

Thank you

Radha

I know your life is so filled already with many appeals and work. Please consider this.

September 11, 2012

Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Re: Diablo Canyon Seismic Testing

Dear Mr. Carl:

I am a big supporter of Nuclear power and would normally be sending a mail in support of building new or supporting existing reactors. However in the case of the Diablo Canyon reactor I cannot in good conscience support this seismic testing

It will murder thousands of sea creatures including sentient Whales and Porpoises. Then there's the fact that having a Reactor closely associated with two fault lines is the depth of foolishness.

Please help stop this insanity

Larry Paul  
4806 Glen Valley Drive  
Arlington, TX 76018-1254

CORRECT ADDRESS

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

RECI

SEP

CALI  
COASTAL  
CENT

*Please accept this  
E-mail copy letter  
as my own words.  
It says all I believe  
in a concise way.  
There are many who  
are passionate about  
this! - S.E*

Resolution Opposing Diablo Canyon Seismic testing

Whereas; California enjoys a multi-billion dollar ocean based economy providing jobs, food, recreation and research opportunities, and

Whereas; The Marine Life Protection Act was mandated by the Legislature, and led by the California Fish and Game Commission to create a series of Marine Protected Areas along the coast of California in a seven-year process to return our ocean to health and abundance,

1 of 2

9/11/12 3:25 PM

\*\*\*

Whereas; Seismic testing at Diablo Canyon would entail 260db sonic blasts, have a catastrophic effect on whales and marine life off our coast, including in the Point Buchon State Marine Reserve, would yield only moderate scientific results, and would not change the precarious situation of having a nuclear plant sited on an earthquake fault,

So be it resolved;

We, the members of Stop Diablo Canyon Seismic Testing do hereby resolve that the health of the marine ecosystem, including our whales, is more important to our community than keeping Diablo Canyon Nuclear Plant in operation and,

So be it resolved

We, the members of Stop Diablo Canyon Seismic Testing do hereby resolve to oppose such destructive seismic testing wherever and whenever it is proposed in the sea

So be it resolved, on this 6th day of September, 2012

*Sybil Etter*

--

SEPTEMBER 11, 2012

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SEP 14 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

CALIFORNIA COASTAL COMMISSION

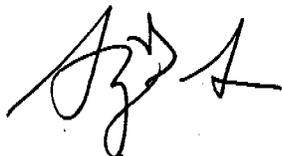
DEAR SIRs:

PLEASE DO NOT APPROVE PG&E'S PLAN TO  
DO SEISMIC TESTING OFF THE COAST FROM  
DITBLO CANYON.

THE COST OF LIFE TO THE MARINE ENVIRONMENT  
WILL BE TOO GREAT.

EXPERTS HAVE RECOMMENDED THAT THEY DO THEIR  
SEISMIC TESTING UNDER UNIT #1 AND IN THE  
IRISH HILL AREA WHICH POSTS A MUCH GREATER  
THREAT TO THEIR NUCLEAR POWER PLANT.

THANKS FOR YOUR CONSIDERATION.



STEPHEN J. SMITER (805) 835-6689  
402 MONTEBELLO OAKS DRIVE  
PASO ROBLES, CA 93946

9-11-2012

Central Coast District Office  
c/o Dan Carl  
725 Frint St., ste. 300  
Santa Cruz, CA 95060

Lorna Teixeira  
376 Buena Visat Ave  
San Luis Obispo, CA 93405

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SEP 14 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dan Carl, I am writing on behalf of the whales who meander through these ocean waters, gifting us with their amazing performances and all of the sea life that has flourished here thanks to the wonderful environmental protections that have been put in place here on the Central Coast. We live in one of the most spectacularly gorgeous areas in the world, mostly because of the pristine beaches, waters and scenic surroundings. Many of our incomes are based on this surrounding beauty. I am horrified that a corporation can bully its way right through the regulations that protect this pristine environment. PG&E will affect ALL of us not only on the Central Coast but each of us on this planet by doing a massive amount of damage to all of the sea life in its wake, most of it we won't even see, the most delicate and fragile underwater microcosms, but the great travesty that will surely be seen will be the beached whales as well as dead dolphins and porpoises washing up upon our shores. We are all connected on this great planet and need to value the lives of others as we do our own species, which I recognize we don't do well either, but there undoubtedly NEEDS to be a change.

We cannot keep condoning this destructive path we are on or we will no longer be living on a habitable planet. PG&E will be blasting guns at 250 Db. That is equal to an atomic bomb blasting off every hour on the hour for 80 days. Would you like to undergo that sort of noise in your neighborhood? All this because a nuclear power plant is overdue to retire soon, wants to extend its life. Oh wait! Forgot to mention it was built on the San Andreas Fault line, plus a few more it seems. Who ever thought that was a good idea in the first place? I guess the same brilliant sort of people that have no regard for living creatures, human or otherwise. This is all about to begin in November, but it needs to be stopped! If this is all being done in the name of safety, then lets do this right and invest the 64 million dollars on renewable SAFE energy sources rather than killing innocent whales and other marine wildlife. The time for change is now! My vote is to protect the sea, without question!

Please don't let this happen here on the Central Coast, this devastation will be on your conscience if it does.

Thank you,  
Lorna Teixeira

September 11, 2012

Dan Carl, Deputy Director  
CENTRAL COAST DISTRICT OFFICE  
725 Front Street, Suite 300  
Santa Cruz CA 95060-4508

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Re: Diablo Canyon Seismic Testing

Dear Director Carl:

I am all for nuclear power, but I am totally against the destruction  
of marine life to learn what we already know - that building a nuclear  
power plant on an earthquake fault is stupid!

PLEASE DO NOT ALLOW THE TESTING THAT WILL DESTROY THE MANY WHALES,  
DOLPHINS AND SEA LIFE who live in the area!

You may be against this bill; and, if you are, I thank you and will remember that you opposed this  
horrific slaughter of marine life.

Please do all you can to prevent this testing.

Waiting and watching,

amy jo grahl  
4806 Glen Valley Drive  
Arlington, TX 76018-1254

Sept 11, 2012

Dear CA Coastal Commission -

PLEASE do not approve PG+E's seismic testing along our Central Coast. This testing will devastate our marine life & our tourism. Please not allow this.

We have a beautiful sanctuary at Pt. Buchon & we want it kept intact with LIFE not death upon our beaches.

Thank you for considering my letter.

Respectfully ~

Diane Smith  
402 Montebello Oaks Dr.  
Paso Robles CA 93446

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CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Alexandra Ferguson  
2069 P/H Place  
Cambrian, Ca. 93428

September 11<sup>th</sup> 2012.

Dear MR Carl,

Please do not allow PG+E to run their underwater texting along the central coast. It would be catastrophic for marine & human life both.

I appreciate anything you could do to fight this ridiculous texting. Please count on me for support.

Thank you,

Alexandra.

**Central Coast District Office**  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
**(831) 427-4863**  
FAX (831) 427-4877

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SEP 10 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

September 9, 2012

Dear Deputy Director Dan Carl,

Upon reading about the possible devastation the seismic testing for Diablo Canyon Nuclear Power Plant may cause to our rich treasure of marine life, I urge you to work to stop the soon upcoming seismic testing. The creatures from the tiniest nudibranch to the great Blue Whale are worthy of our protection. It would be cruel and inhumane to subject highly intelligent mammals that utilize sonar to survive to the damaging blasts necessary to conduct seismic testing. It would surely mean a horrible slow death to many of them. To me, we would be conducting something just as, or even more horrific than the annual dolphin kill in Japan. The Gray Whale has come back from near extinction, its numbers are still limited, and yet, seismic testing is planned as they make their annual migration through the very area the testing is to take place. Our area is also home to many commercial fisherman. We enjoy some of the best fresh fish in the world. Our fish are a valuable resource. Every living thing within the range of the testing is essential to maintaining the delicate balance in the ecosystem and should be protected.

Thank you for your service.

Very Sincerely,



Cindy Fear  
317 E. Cherry Ave.  
Arroyo Grande, CA 93420

HUDSON RIVER SCHOOL PAINTINGS

Frederick Edwin Church (American, 1826-1900)

Coast Scene, Mount Desert (Sunrise off the Maine Coast) 1863

Oil on canvas, 36 1/2 x 48 in.

Bequest of Mrs. Clara Hinton Gould

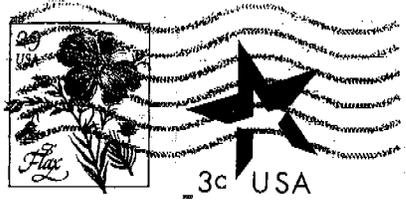
Salmon

St. George's Society Blind #2149

Santa Clara

CA 95051

9/10/12



Please deny approval for P&E's plan to do seismic testing at Diablo Canyon. That nuclear plant should be removed.

POSTAGE BOX 6099 ROBERT PARK CA 94927

Central Coast District Office  
Dan Carl, Deputy Director  
725 Front St, Suite 300  
Santa Cruz CA

95060-4508

Buying off local fisherman is obscene! We need energy conservation!

© Wadsworth Athenaeum

Jean Salmon

Dear Coastal Commission:

Please help our coastal  
neighbors the wonderful Marine  
Mammals to continue their visits  
to the Calif. Coast as seen in  
San Luis Bay.

I beg you to not allow P.G. & E  
to conduct seismic mapping off  
the central coast.

Please, Please!

Thank you  
Mailee Hoyer  
LOS OSOS CA.

Dear Dad,

Hope you are well.  
Please do everything  
in your power to  
stop the ill-conceived

P.G. & E. plan to  
conduct "Seismic testing"  
off of Point Barrow

This testing will  
kill untold numbers  
of whales, dolphins  
sea lions, fish, etc.

Just a note...

Truly an exercise  
in counter-productivity

Diablo Canyon &  
SAN ONOFRE Nuclear  
plants MUST be closed  
ASAP!

ALL THE BEST, J.

JEFF WELSHANS  
SAN DIEGO ST. U.  
MARINE BIOLOGY  
Dept.

Just a note...

California Coastal Commission  
Headquarters Office

Please do not allow seismic testing a Diablo.  
It will kill creatures, cost a lot of money and  
provide little insight.

It is already known that Diablo sits of several  
faults and no amount of testing will show how they  
will react.

Thank you



Don Lytsell  
387 S. COURT  
LOS ANGELES, CA  
93402-2427

Monday  
Sept 10, 2012

To: Dan Carl

I just read about PG&E's plans to engage in seismic testing off of the central coast of California.

If they move forward on this issue an unknown number of marine mammals could die from noise pollution.

Yes there is such a thing. It is very irresponsible and deadly for PG&E to use air cannons off the California coast or anywhere else for that matter. Please cancel the plans by PG&E and save the marine life that is in their path of destruction.

Thank you

Joan Lorenz

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SEP 12 2012

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CENTRAL COAST AREA

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SEP 10 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Melinda Reed  
215 Foxtail Lane  
Templeton, CA 93465

[PerfPetals@aol.com](mailto:PerfPetals@aol.com)

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front St. Suite 300  
Santa Cruz, CA 95060-4508

FAX 831 427-4877

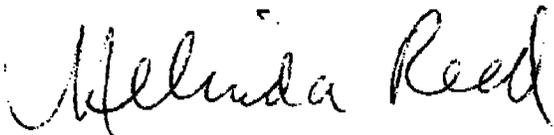
Dear Dan Carl,

Please do not allow seismic testing for the Diablo Canyon nuclear power plant. We live in earthquake country, on top of an active zone, but our marine life should not have to endure man's testing that may make their world unlivable. The risk to their lives is tragic. Figure out another method to determine the safety of earthquake testing without endangering the sea animals.

Put the money into alternative energy sources. The whales and marine life should not be subject to this. Please enforce the Point Buchon State Marine Reserve.

Thank you.

Best regards,



Melinda Reed

SHEILA J. GILMORE

---

PG&E  
Bodega Bay, CA 94923-4581  
[kidcrone@comcast.net](mailto:kidcrone@comcast.net)

September 9, 2012

**California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508**

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SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Deputy Director Carl,

I am horrified to hear the news of PG&E's intended seismic testing off the southern California coastline. I live along the northern California coast and am more and more aware of just how sensitive and interconnected all life is along the shores and marshlands. Please do everything in your power to stop this effort.

I'm not just interested in preventing this because of how it will affect my own coastal plant and animal life, but also because it will cause flagrant and irresponsible devastation of marine mammals in the areas where it takes place. No matter where such testing is planned, the result would be the same. In regions where this sort of testing has been done, countless dead marine animals washed ashore for weeks during and after testing, blood dripping from areas such as their eyes, nose, ears or mouth — a sign they had suffered catastrophic internal hemorrhaging.

In my opinion, we as humans are charged with caretaking of ALL life and resources within our purview. It is my understanding that the California Coastal Commission was founded with the intent to protect the resources, plant, and animal life along our coasts, both on and offshore. You are in a position to prevent an enormous destruction of marine mammals. I ask you to refuse PG&E's request.

Thank you for your assistance.

Sincerely,



Sheila J. Gilmore

Judith L. Griffin

September 9, 2012

1327 Tanglewood Dr.

San Luis Obispo, CA. 93401

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SEP 14 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dan Carl, Deputy Director,

CA Coastal Commission, 725 Front Street #300,

Santa Cruz, CA 95060-4508

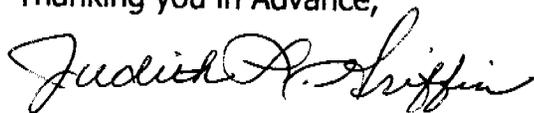
### **Stop the Diablo Canyon Seismic Testing**

All of us that live here on the Central Coast are well aware that we have issues surrounding the placement of Diablo Canyon Nuclear Power Plant and have know this since before it was built.

What will anyone possibly gain to run this Seismic Testing to tell us what we already know?

The killing of sea creatures and injuries too many more is in no way acceptable. Our Marine Life is one of a kind and even if it wasn't the killing and destruction of any and all of them is inhumane on all levels.

Thanking you in Advance,



Judith L. Griffin

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 11 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Deanna Al-Hariri  
PO Box 2184  
Avila Beach, CA 93424

September 7, 2012

To the California Coastal Commission:

Resolution Opposing Diablo Canyon Seismic testing

Whereas; California enjoys a multi-billion dollar ocean based economy providing jobs, food, recreation and research opportunities,  
and

Whereas; The Marine Life Protection Act was mandated by the Legislature, and led by the California Fish and Game Commission to create a series of Marine Protected Areas along the coast of California in a seven-year process to return our ocean to health and abundance,  
and

Whereas; Seismic testing at Diablo Canyon would entail 260db sonic blasts, have a catastrophic effect on whales and marine life off our coast, including in the Point Buchon State Marine Reserve, would yield only moderate scientific results, and would not change the precarious situation of having a nuclear plant sited on an earthquake fault,

So be it resolved;

We, the members of Stop Diablo Canyon Seismic Testing do hereby resolve that the health of the marine ecosystem, including our whales, is more important to our community than keeping Diablo Canyon Nuclear Plant in operation and,

So be it resolved

We, the members of Stop Diablo Canyon Seismic Testing do hereby resolve to oppose such destructive seismic testing wherever and whenever it is proposed in the sea

So be it resolved, on this 7th day of September 2012



California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Subject: Central Coastal California Seismic Imaging Project

Dear Director Carl,

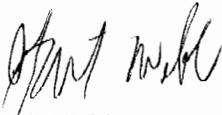
I strongly oppose the acoustic seismic testing being proposed for the Central Coast by PG&E. There are faults where the nuclear power plant is located and blasting the ocean for more information about the offshore faults will not change the fact that the plant is in the known terrestrial fault zone.

The danger from this kind of high energy seismic testing far outweighs any possible benefits of knowing more about the ocean faults offshore. Unlike the terrestrial testing, water transmits sound waves powerfully. This transmission of energy causes tremendous damage up and down the water column from fish larvae to marine mammals. We are blessed on the Central Coast to have an ecosystem with diverse wildlife. The Southern Sea Otter, a threatened species, is home to these waters. Whales, harbor porpoises, dolphins, sea lions, Pacific Harbor seals, Northern Elephant Seals live in these waters. Having monitors on board the testing vessels to look for animals in the area and stop the testing when they see animals is not sufficient protection for wildlife. Many of these animals are underwater and monitors will be unlikely to be able to spot them or keep them from being damaged by the air gun blasts that will transmit the damage further than the monitors can see. The impacts from the blasts can kill a generation of fish larvae and scatter fish populations that will be devastating to the fisheries. The endangered species of Steelhead live in these waters. Besides damaging the animals that are mobile in the water, there are the many species that can not leave that live on the rocks and in the mud below. Many forage species that are an integral building block of the ocean's ecosystem will be affected. The disruption of the food web off the Central Coast will have long ranging damaging impacts.

The study is being proposed in areas that are special and unique. These areas have been recognized as places to be preserved and conserved. Making a path of destruction through these areas is unnecessary and an unconscionable waste and destruction of our precious natural resources.

Due to the substantial negative impacts from this kind of acoustic study, the No Project Alternative using existing data and the information that PG&E is collecting terrestrially is the only acceptable option.

Sincerely,



Margaret (P.J.) Webb  
P.O. Box 702  
Cambria, CA 93428

Please deny approval  
for seismic testing off the coast of California

Barbara Aygun  
Pacific, CA 94044  
650-270-9143

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SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

September 7, 2012

### PG&E Seeking Approval for Seismic Testing on California's Central Coast Deafening Assault is Likely to Wipe Out Thousands of Marine Animals, Including Virtually Every Living E

In an effort to continue operating a nuclear plant that sits on known active earthquake faults, Pacific Gas & Electric (PG&E) is seeking permits to engage in seismic testing off the Central Coast of California. According to a PG&E representative at an informational meeting, "the proposal calls for a 240-foot ship to tow a quarter-mile wide array of twenty 250 decibel "air cannons," along a 90-mile stretch of California's Central Coast. The cannons will shoot deafening underwater explosions once every twenty seconds, day and night, for 42 days and nights. The region where this devastating assault on wildlife is expected to take place includes the "protected" Point Buchon State Marine Reserve.

The decision occurs at a time when humpback and blue whales have appeared in shockingly large numbers off the California coast to feed on krill. The seismic testing will kill great blue whales, gray whales and others, dolphins, porpoises, seals, sea lions, otters, and fishes. PG&E has offered to buy-off commercial fishermen in the area to compensate for anticipated losses if the plan is allowed to go forth.

PG&E plans to produce a 3-D map of the shoreline fault's deeper regions. Hydrophones in the water and on the sound as it resonates through sea and earth, and the resulting data is expected to help geologist power has ever been done in California waters before and according to the Environmental Impact Repo is staggering. In regions where this sort of testing has been done, countless dead marine animals wash a dripping from areas such as their eyes, nose, ears or mouth — a sign they have suffered catastrophic int

This seismic testing is expected to yield only moderate mapping results and, according to Fish and Game the Point Buchon State Marine Reserve of all living marine organisms" including Sperm, Pygmy Sperm, Hl Whales, and many other species of fish and marine mammals, right down to the plankton.

According to independent journalist Dave Gurney on noyonews.net:

"Each of these underwater blasts will be at the volume level of a shock wave, that will instantly deafen, n enough to be in its path. A 240 dB blast is reportedly like being one foot away from the mouth of a large of your ears, would probably never stop ringing. The consequences of experiencing this level of sound co permanent deafness – if not worse. For sea life, beyond just broken eardrums, the transfer of low-frequei causes hemorrhaging of lungs and air-sacks, and will result in the death of marine mammals – whales, d

The Natural Resources Defense Council also put out a warning stating that the loud blasts could deafen heavily upon their sense of hearing for survival.

The Diablo Canyon nuclear plant was built in 1968 at the mouth of a coastal canyon, above the then-ur unknown fault was discovered running along the shoreline. "Our position is that seismic testing is a threa allows PG&E to delay removal of the nuclear plant from the earthquake fault," according to Stop the Di

The seismic testing is scheduled to run from early November to early December of this year. Now is the t to ensure approval is denied for this ill-conceived plan. Please check back for updates on how you can

**RECEIVED**

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

5 September 2012

Dear Mr. Coak,

I am writing to you to request that you and the other members of the California Coastal Commission deny PG&E the authority to begin seismic testing on the Central Coast. My reasons are many but rather than state them all, I would like to say, mainly, that I believe this will have an enormously detrimental effect on ocean life in this area for years to come. No one, at this point, can determine the consequences and, for that reason alone, this is an experiment that places all sea life in danger. Speaking for these majestic animals, I ask that their lives and the beauty they bring to ours be considered before the Coastal Commission gives its permission to proceed. Thank you.

Cambria, Ca

Sincerely,  
Jan Hillary  
Bon Hillary

Sept 6 2012  
RECEIVED

SEP 11 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Dan Carl:

I am former Downtown Brown  
Community Bear Mascot is  
San Luis Obispo. I am writing  
to tell you that Seismic Testing  
will put too many whales in  
danger, and the Commission (Fish  
and Game) should enforce the  
Point Buchon State Marine Reserve.  
This letter is to hold my leader  
accountable.

No Diablo Testing! They can go  
ahead, and move it... Not kill  
all the marine life. Please make  
good history thru protective  
nature.

Zylor Lord Hamilton

805-563-6324

**THANK YOU WHALES!**

*Why are we thanking the whales?* Simple- because they have shown up in the largest numbers seen since pre-hunting levels **JUST IN THE NICK OF TIME** to help us put a stop to Diablo Canyon Nuclear Plant's destructive **PLAN TO BEGIN SEISMIC TESTING** in these waters! What is seismic testing? It is like giving the ocean bottom an MRI, done with a boat that has many air cannons dangling in the water behind it. Each cannon shoots out a sonic sound blast of 260 db (loud enough to cause instant deafness or death (which for a whale, deafness IS death). These sonic blasts will fire every 13 seconds around the clock from November to December. It is likely that few creatures can survive the assault. In Peru this year, over 900 Porpoises washed up dead on the beaches and even the plankton showed damage.

**SEISMIC TESTING IS A THREAT TO WHALES AND ALSO A THREAT TO US BECAUSE IT ALLOWS PACIFIC GAS AND ELECTRIC TO DELAY REMOVAL OF THE DIABLO CANYON NUCLEAR POWER PLANT FROM THE EARTHQUAKE FAULTS IT SITS ON.**

Seismic testing will do nothing to change the danger of an earthquake induced nuclear catastrophe on the central coast and these 260db sonic blasts **MAY ALSO KILL SURFERS SNORKLERS SWIMMERS AND DIVERS** in the water. It is also expected to destroy all living organisms in newly designated Point Buchon State Marine Reserve.

---

E mail the Fish and Game Commission and tell them:

**SEISMIC TESTING WILL PUT TOO MANY WHALES IN DANGER, and the Commission should ENFORCE THE POINT BUCHON STATE MARINE RESERVE.**

Contact them at: e mail: [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)  
Sonke Mastrup, Executive Director

\*This issue will also be heard by the California Coastal Commission in October far away from us, in Oceanside, California, down near San Diego. If you can't be there, Write to the California Coastal Commission at:

\* Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508  
**(831) 427-4863**  
FAX (831) 427-4877

**Tell them NO SEISMIC TESTING! HISTORIC AMOUNT OF WHALES PRESENT- ENFORCE POINT BUCHON State Marine Reserve- No DIABLO SEISMIC TESTING\***

**\*Visit and join our facebook page: Stop the Diablo Canyon Seismic Testing Thank you!**

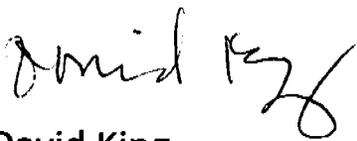
5 Sept 2012

Dan Carl, Deputy Director  
725 Front Street, Ste 300  
Santa Cruz CA 95060-4508

Mr. Carl,

I oppose the proposed seismic testing being considered off the coast of Diablo Canyon. Not only is it possibly deadly to marine life, but I am being told to stay out of the water during this time. I am a surfer and do not appreciate my way of recreating being threatened. I also fish and am concerned that the fish may be killed or forced to relocate, with a chance that they will not return after the testing. There must be another way to determine if the plant needs retrofitting. Please reconsider.

Sincerely,

A handwritten signature in black ink, appearing to read "David King", written in a cursive style.

David King  
2001 Doris  
Los Osos CA 93402

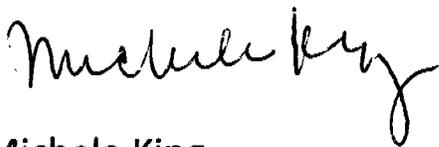
5 Sept 2012

Dan Carl, Deputy Director  
725 Front Street, Ste 300  
Santa Cruz CA 95060-4508

Mr. Carl,

The seismic testing being considered off the coast of Diablo Canyon poses too dangerous a threat to our precious sea life. The presence of the whales just short weeks ago in this area is reason enough to either stop it completely or find another way to determine if the plant needs retrofitting. Please reconsider.

Sincerely,

A handwritten signature in cursive script that reads "Michele King". The signature is written in black ink and is positioned above the printed name.

Michele King  
2001 Doris  
Los Osos CA 93402

**RECEIVED**

SEP 05 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Central Coast District Office  
Dan Carl, Deputy Director

I am writing you to express my concern over the PG&E seismic testing currently slated to start off the Central California Coast this fall.

These tests are being sold as "necessary" to map the known earthquake fault lines near the PG&E Diablo Canyon Nuclear power plant. The fault lines were known at the time the plant was built. PG&E will be spending 64 million dollars on these tests, they in turn will pass along that cost to customers. I question exactly what will be done with this information? Will they close the plant if it's found to be "unsafe"? It seems these tests are merely a political playing card for them to continue to operate in the area in the wake of the Fukushima disaster. A simple knee jerk reaction to a horrible tragedy. But this is not a debate about nuclear power. This is a call to save not only our marine life, but our local economy.

The seismic testing would consist of life-threatening/deadly sound blasts of the ocean floor every few seconds for over a month, 24 hours a day. Environmental impact reports are clear that this would injure & in many cases kill marine life in the area from whales, dolphin, otters, sea turtles, seals and several species of bird. Also at risk are plankton & larva systems which are the building blocks for our sensitive marine environment.

Without a healthy marine environment, coastal community economies will suffer. Fishing industries will fail, local businesses depending on the fishing industry will close. Tourist based businesses will be obsolete. The health of the ocean is directly proportional to the health of our communities.

PLEASE do what you can to STOP these tests. Let's find an alternative that will save our ocean.

Thank you for your time

  
Carolyn Jolly  
224 Seaview Ave  
Pismo Beach Ca 93449  
559-936-5395  
SLOhikerCJ@gmail.com

9/3/12

Dear Coastal Commission,

I am writing  
to ask you NOT  
to allow

seismic mapping  
of waters  
offshore of

Diablo Canyon.

These loud sounds  
could significantly  
harm the

hearing of

marine mammals

\* even cause  
deaths.

THANK YOU,

Anaerdda Elyal

San Luis Obispo,

CA

\* Animal Lover \*



Sept. 3, 2012

California Coastal Commission  
45 Fremont St., Ste 2000  
San Francisco, CA 94105-2219

RECEIVED  
SEP 06 2012  
CALIFORNIA  
COASTAL COMMISSION

Re: Seismic surveying

Dear Sirs,

I am urging your agency to not allow PG&E to conduct seismic mapping along the coast from Cambria to Guadalupe. This is significantly harmful to the whales and other marine life. This activity is an over reaction to the Fukushima disaster.

There must be other avenues to pursue to satisfy you, the California Energy Commission and the State Lands Commission. PG&E has already provided much information on the earth quake faults in the affected area.

Thank you for your attention to this.



Shirley Read  
2458 Alameda Dr.  
Paso Robles, CA 93446

RECEIVED

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Sept. 3, 2012

Dear California Coastal Commission:

I urge you to intervene and stop PG+E from planned seismic testing near their Diablo Canyon nuclear plant or anywhere else. The goal of mapping earthquake faults is admirable, but the cost to marine life is much too high.

Marine mammals along our coast are a precious resource and bring tourist dollars to our state. They are also just amazing creatures that don't deserve to be needlessly tortured and possibly killed.

Please urge PG+E to look for alternatives in their goal to map the faults.

Sincerely,

Anson Jacks

Anson Jacks  
34670 Calcutta Dr.  
Fremont CA 94555

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
715 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

**RECEIVED**

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

September 3, 2012

Dear Mr. Carl;

I'm writing to you regarding seismic testing that is about to begin off the Central Coast of California. According to Fish and Game Commissioner Richard Rogers, this testing would "~~cleanse the Point Buchen State Marine Reserve of all living marine organisms~~" including Sperm, Pygmy Sperm, Humpback, California Gray and Great Blue Whales, and many other species of fish and marine mammals, right down to the plankton. The seismic testing is scheduled to run from early November to early December, just weeks away.

Please do all that is in your power to stop the testing. According to reliable sources, Diablo Nuclear Power Plant is already being retro-fitted in case of a catastrophic earthquake and they are already aware of the faults that exist. This seismic testing is strictly oil exploration.

Respectfully,



Barbara Gilder  
519 W Taylor St #72  
Santa Maria, Ca 93458

Dan Carl, Deputy Director

Sept. 2, 2012

725 Front Street, Suite 300, Santa Cruz, CA

**RECEIVED**

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Coastal Commissioner,

After reading the Environmental Report from PG& E I noticed that the mitigation only mentions the fishermen who will surely need help. There is no program for cleaning up the dead animals that will litter the beaches. There is no program for recovery of the disoriented birds and mammals. There is no program for the renewal of the ocean floor. There is no program for the restaurant and tourist companies that will be affected by the lack of local fish and tourists. And there is no written agreement for having food the next time the Humpback Whales or others come through this county's near ocean.

In AB1632 Report (2008 CEC) it says that the 3D seismic testing will "supplement" and "help resolve" the renewal for Diablo Canyon. This "supplement" of information then becomes the cause of the need to clean our near ocean of life. I don't agree. Let us make the decision believing the connection is real and agree to upgrade for an 8.0 quake or close the plant.

Thanks,



Harvey Cohon

1358 Purple Sage Lane

San Luis Obispo, CA 93401

September 2, 2012

Mr. Dan Carl, Deputy Director  
California Coastal Commission  
725 Front Street, Ste. 300  
Santa Cruz, CA 95060-4508

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SEP 12 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Deputy Director Carl,

I'm writing to protest the seismic testing for Diablo Canyon Nuclear Power Plant. I think it's a terrible shame that our ocean ecosystem should be destroyed for this reason. My father was Public Health Officer (George Harper) when that plant was approved in the '60's, & as I'm sure you know, very few people knew the dangers of nuclear power. When it came to light that it was on the active Hosgri earthquake fault, there was no way that PG&E was ever going to close it down, because of how much money had been spent to build it. I realize that damage control is now going on because of what happened to the plant in Japan due to the ~~the~~ tsunami.

-2-

It appears that this seismic testing is a show so that the public will feel PG&E is doing all they can to be safe. The fact is, they already know how dangerous it is to have a nuclear power plant close to an active earthquake fault (i.e. apparently there's another active fault -- I live back East so have been out of the loop). What difference is the seismic testing going to make ??? Shouldn't they just make sure the plant is as safe as possible, no matter what any such testing would show? Under the circumstances?

Please, please stop this! Thank you!

Sincerely, Julie Rose Harper  
julharper@earthlink.net Julie Rose Harper

Dear Coastal Commission

9/11/12

Please, Please dont allow seismic testing! Not only will it kill off our sea mammals - what a SAD and disgusting sight of them all washing up on shore! Defenately a site I dont want to see - nor our 1000's of tourists who come to our beaches. Have you thought of the smell? The disposal? The clean-up? How sure PG&E's selfishness does not care - they just see dollar signs - and potential places to put oil barracks!  
It is all a scam - about the mighty dollar sign!

Marberty Cottaned  
2346862

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SEP 17 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

The Coastal Commission  
725 Front Street, Suite 300  
Santa Cruz, CA 95060

Sept. 1, 2012

**RECEIVED**

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Commissioners,

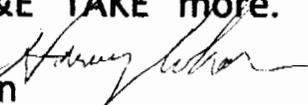
From early November to late December a 'scientific' research ship will travel back and forth in a set of grids from Guadalupe to Cambria with 260 decibel air gun explosions to study the Coastal Fault's length and possible connection for greater size, to the Hosgri Fault. PGE already has 2D images that detail these possible connections and now will do a 3D image. For this we must create seismic noise that, according to their EIR, will kill, deafen and disorient.

The State Lands Commission has given its 2 vote "Certification" (attest as being true) to the EIR after hearing from scientists, fishermen, environmentalists and others who are against it. As a ratepayer who will pay the costs I would rather spend the money and retrofit Diablo Canyon for a 7.5 earthquake than give them the rest of our ocean animals. The plant already takes billions fish larva and small ocean creatures through their once-through cooling.

In AB1632 Report (2008 CEC) it says that the 3D seismic testing will "supplement" and "help resolve" the renewal for Diablo Canyon. This "supplement" of information then becomes the cause of the need to clean our near ocean of life. I don't agree. Let us make the decision believing the connection is real and agree to upgrade for an 8.0 quake or close the plant.

Don't let PG&E "TAKE" more.

Harvey Cohon



1358 Purple Sage Lane, San Luis Obispo 93401

**RECEIVED**

SEP 07 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

September 1, 2011

California Coastal Commission  
Central Coast Deputy Director  
725 Front St., Suite 300  
Santa Cruz, CA 95060-4508

After witnessing the incredible whales in Avila Beach, PLEASE STOP the seismic testing that PGE is conducting.

I feel this will harm our wildlife in the ocean and that Diablo Canyon Nuclear Power Plant needs to be shut down.

Sometimes it feels hopeless to try to fight big business (PG&E) but we must try.

*CWinstead*  
<http://about.me/conniewinsteadrealtor>  
Connie Winstead, Realtor, CDPE & Notary Public  
Signature Properties CA DRE#00715520 since 1979  
805.474.0100 office 805.474.0150

Check out my website at [www.CWinsteadSLO.com](http://www.CWinsteadSLO.com)  
Oh by the way, if you know anyone who would appreciate the level of service that I provide,  
please let me know. I'm never too busy for your referrals!

**Direct Phone 441.4601**

Dear California Coastal Commission,

I am writing to let you know how concerned I am, along with many other San Luis Obispo county residents, with the prospect of upcoming seismic testing in our coastal waters. These tests could have lasting and damaging impacts on our marine environment and disrupt the behavior of endangered humpback whales, harbor porpoises, and other marine life. We all know there are seismic faults offshore of Diablo Canyon nuclear reactor. The plant is unsafe and **NEEDS** to be shut down! There is no need for tests to tell us that. What is the mission of the CCC? It is to Protect, Conserve, Restore, and enhance our coast and ocean! By allowing seismic testing you will be going against everything the CCC stands for. If the government does not protect our most valuable resources, who will? The time to act is now; we, the citizens of the central coast have said **NO** to seismic testing.

Sincerely,

Eric Brunschweiler

**RECEIVED**

AUG 31 2012

CALIFORNIA  
COMMISSION  
COAST AREA

**RECEIVED**

SEP 05 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

August 30, 2012

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Dear Commissioners

Please do not allow PG&E to do seismic testing in the water near Diablo Canyon Nuclear Power Plant. It will harm or potentially kill many of the sea's beautiful creatures. There are simply too many whales and other wildlife in this area along the Central Coast for seismic testing to be done responsibly. **Please enforce the Point Buchon State Marine Reserve!**

PG&E's request to do seismic testing is simply an attempt to prove the safety of an aging nuclear plant that sits on an earthquake fault. It's simply a corporate attempt to fog the real issues. This aged nuclear power plant has the potential to harm all life including thousands of people along the central coast. Have we learned nothing from the Japanese experience at the Fukushima Daiichi nuclear plant? Sadly PG&E proposes this weak attempt to prove the safety of its aged plant at the expense of the whales and other sea life.

This planet belongs to all creatures -- great and small - and it is up to mankind to protect it. **Please enforce the Point Buchon State Marine Reserve!**

Thank you,



**Claire C. Sheehy**  
**1045 La Serenata Way**  
**Nipomo, CA**  
**805 451-0705**

RECEIVED

SEP 05 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

August 30, 2012

*California Coastal Commission*

Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Dear Commissioners

Please do not allow PG&E to do seismic testing in the water near Diablo Canyon Nuclear Power Plant. It will harm or potentially kill many of the sea's beautiful creatures. There are simply too many whales and other wildlife in this area along the Central Coast for seismic testing to be done responsibly. **Please enforce the Point Buchon State Marine Reserve!**

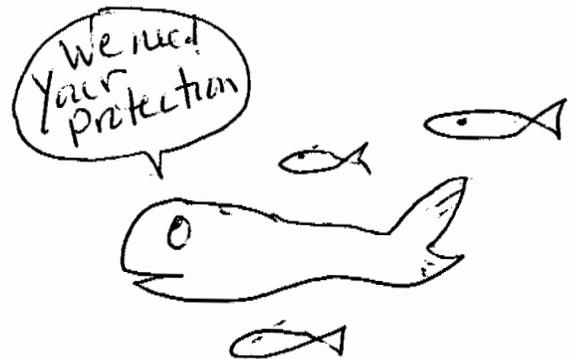
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This planet belongs to all creatures – great and small - and it is up to mankind to protect it. **Please enforce the Point Buchon State Marine Reserve!**

Thank you,

*Ethel Landers*

**Ethel Landers  
1045 La Serenata Way  
Nipomo, CA  
805 929-1444**



**RECEIVED**

August 30, 2012

SEP 04 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

California Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Dear Commissioners,

I am writing to urge you to deny PG&E request to do seismic testing in the water near Diablo Canyon Nuclear Power Plant. Many of the sea's beautiful creatures live in those waters and must not be put in danger by this testing.

There are simply too many whales and other wildlife in this area along the Central Coast for seismic testing to be done responsibly. The Point Buchon State Marine Reserve specifically protects this area and the restrictions that protect the wildlife must be strictly enforced.

PG&E's request to do seismic testing is simply an attempt to prove the safety of an aging nuclear plant that sits on an earthquake fault. It's is only a corporate attempt to fog the real issues. This aged nuclear power plant has the potential to harm all life including thousands of people along the central coast. Have we learned nothing from the Japanese experience at the Fukushima Daiichi nuclear plant? Sadly PG&E proposes this weak attempt to prove the safety of its aged plant at the expense of the whales and other sea life.

**Please enforce the Point Buchon State Marine Reserve!**

Thank you,



Evonne Davenport  
620 La Crosse Dr.  
Morgan Hill, CA.

8/29/12

Central Coast District Office

Dan Carl, Deputy Director

725 Front St. Suite 300

Santa Cruz, CA 95060-4508

RE: Seismic Testing-URGENT

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AUG 29 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear Dan Carl,

I am writing on to you in regards to the seismic testing at Diablo Canyon Nuclear Power Plant and my concern for the out of control disaster that is ongoing in Japan. My first concern in regards to nuclear power plants is that Japan has still not contained it's leaking nuclear power from the catastrophic disaster that occurred as a result of its tsunami on March 2011. It's radiation effects are being felt currently in California. 14 out of 14 tuna's tested by scientists last month (July 2012), all tested positive for radiation. These tuna were off the coast of San Diego, California. As of this very minute this nuclear power "leak" is still spreading it's deadly contents into the sea at an alarming rate and is constantly spreading this nuclear waste water throughout the ocean, past Hawaii and onward to California. This is far from contained and we are very close to seeing the other nuclear generators there fail as well; they are far from contained and can meltdown at any minute causing widespread colossal damage to the environment impacting our food supply as well as our environment. This in itself is an atrocity. We need to be working to fix the situation at hand in Japan as we are directly affected by it here in the United States.

Once that is handled- as it is the utmost life threatening emergency we need to take proper precautions to ensure that could never happen here. This is a safety concern above all for all the residents of the United States.

My second concern is protecting the ocean life that is currently already stressed and affected by the Japanese nuclear plant meltdown. Seismic testing is animal cruelty. It is a documented fact that whales, dolphins, sea turtles, as well as other protected marine life will be rendered deaf from the impact of blasting the ocean with 260decibal blasts. These animals need to hear they communicate with each other and it is part of their sonar. At this point we need to be protecting these precious resources- not causing widescale cruel irreparable damage and death. Furthermore, it shouldn't even be a question since there is already regulations in place we would need to comply with regarding the policy already in place stating that there is a no "take" (killing) of marine life in the nearby Point Buchon State Marine Reserve.

That alone should be enough of a deterrent, if however you wish to proceed with this testing, please acknowledge who will be paying the \$50,000 PER dead sea turtle fines? These fines can easily reach the million dollar mark once only twenty of them are dead. Will these fines fall on the

Coastal Commission  
Central Coast District Office  
Dan Carl, Deputy Director  
Madeline Cavalieri, District Manager  
725 Front Street, Suite 300

August 28, 2012C

Sirs/Ms,

I am very concerned and against it being allowed that the seismic testing is being considered off the coast of the Diablo Nuclear Plant. When this was allowed in Peru thousands of whales, dolphins, etc were killed. Now our government is considering allowing our Marine animals to suffer the same results all to allow the nuclear plant to remain open even though it is old (1960's) and sitting upon several active earthquake faults. The seismic testing is extremely loud and harmful.... it is a lot more than twice the sound of a jet engine because, like the magnitude of earthquakes, decibels increase exponentially. This is a thousand times louder than a rocket engine! And everything a whale does in its life, socially, singing, talking, hearing, mating, it's all done with hearing and being heard. Your commission is suppose to be protecting our wild life.... they definitely need your help now..... it is crucial. Thank you for your attention to this matter.

Sincerely,



- . Helen Valk
- . A concerned Californian."

**RECEIVED**

AUG 31 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

To: DAN CARL

8-28-12

Please do NOT allow the seismic testing at Diablo. We need to save ~~the~~ wharves and the marine preserve. Even the WHARVES have come out to Protest. Please do not let PGE do the seismic testing.

Thank you—

Patti Anderson

175 Bali St.

Morro Bay CA

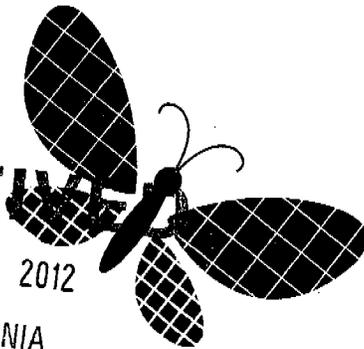
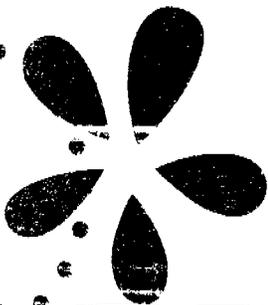
93442

(805) 772-4915

RECEIVED

AUG 31 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA



8-28-12

Dear Mr. Carl -

I'm writing as a concerned citizen of California (and the world!) regarding the seismic testing that kills whales. The marine protected areas, one of which is Point Buchon) are just that - protected! The marine reserve needs to be a place where whales can thrive, not be bombarded w/ loud and disruptive seismic testing.

Furthermore, seismic testing threatens us all because it allows PG&E to delay removal of the Diablo Canyon Nuclear Plant from the earthquake fault it is on.

Please use your influence to stop this threat of seismic testing!

Thank you,

Mrs. Leslie S. Chavez  
Torrance, CA

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AUG 31 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL OCEANIC DISTRICT AREA

# RECEIVED

SEP 04 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Adricne Allebe  
359 Henrietta Avenue  
Los Osos, CA 93402  
805-528-4762  
[Adcedooda@hotmail.com](mailto:Adcedooda@hotmail.com)

8/28/12

California Coastal Commission  
Central District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

Dear Mr. Carl,

I live in Los Osos, CA within a few miles of Diablo Canyon Nuclear Power Plant. My father moved us here from Los Angeles when I was nine years old in order to provide my mother and I with a better quality of life. The quality of life here is inseparable from our abundance of wildlife, which comes from having protected areas. The marine life, which multiple agencies and individuals have fought for years to protect, is now being disregarded by our local government agencies and PG & E. I strongly believe that the seismic testing that they wish to conduct will be both wasteful and ecologically devastating. This testing is a desperate move to keep an outdated, wasteful, and dangerous facility operational. The power plant was already built on several fault lines. What more evidence do we need to prove that it is dangerous, and that what happened in Fukushima would not happen here?

There is evidence throughout the world, most notably in Peru, that seismic testing injures and kills whales, dolphins, fish and other marine life. This is unacceptable. What kind of precedent does it set to allow "protected" animals and areas to be put at such risk? I urge you to not allow PG & E to allow seismic testing due the lack of urgency for these tests, and the likely ecologically devastating consequences of such tests.

Sincerely,



Adricne Allebe

Adjunct Instructor

Cuesta College

Cal Poly, San Luis Obispo

August 28, 2012

Central Coast District Office  
Dan Carl, Deputy Director  
725 Front Street, Suite 300  
Santa Cruz, CA 95060-4508

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SEP 04 2012

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

SEP 03 2012 *cp*

CALIFORNIA  
COASTAL COMMISSION  
CENTRAL COAST AREA

Dear California Coastal Commission,

\$64M might not be a lot of money to PG&E's bottom line, but it IS a lot of money to spend on backward, dangerous, and unsustainable technology that will kill intelligent marine life, including the largest mammals on the planet. The real bottom line is that seismic testing threatens us ALL because it allows PG&E to delay removal of the Diablo Canyon Nuclear Plant from the earthquake fault it is sitting on.

It is quite likely that a large earthquake will strike CA before any further seismic testing can even be completed. Our largest earthquake faults are past their historical averages for big shifts. Residents in CA know that earthquakes are a way of life here and we do our best to prepare for them. The smart, forward-thinking thing to do with \$64M is to invest it in energy alternatives and to phase Diablo Canyon out of nuclear power production. I am not sure if there are places around the world where nuclear power is beneficial (I know there are people who will argue in its favor), but I know with the certainty of our Japanese neighbors that nuclear power plants do not belong in California.

The risk to humans is too great. The risk to marine life is too great. Therefore, the need for seismic testing is a moot point.

Say no to seismic testing and work towards a safe energy future.

Thank you.  
Sincerely.

*Kelly Reed Daulton*

Kelly Reed Daulton  
622 Crocker St.  
Templeton, CA 93465

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AUG 29 2012  
CALIFORNIA  
COASTAL COMMISSION

California Coastal Commission  
Energy, Ocean Resources and, Federal Consistency Division

I am writing in regard to PG&E seismic testing in vicinity of the Diablo Canyon nuclear power plant.

While I have concerns involving both nuclear power safety (of humans and affected sea life) and the marine environment safety (of sea life), it seems to me that SLO County supervisor Bruce Gibson has brought up a good point.

He notes that PG&E intends to use less than the least invasive equipment and methods to conduct their seismic survey on our coast. If we must threaten the sea life in this area in the name of nuclear power why can't we do it with the least impact available?

I hope that the Coastal Commission will seriously consider this information when they review this subject in the near future.

Regards,  
Jim Duncan  
Cambria, CA  27 August 2012

Here is an extract from the SLO Tribune newspaper of 12 July 2012.

Specifically, Gibson said PG&E plans to use a vessel and equipment used in academic research instead of technology of a higher quality used by private industry, such as oil companies, that could yield a better look at the earthquake danger facing Diablo Canyon.

For example, private industry uses research vessels that tow larger arrays of hydrophones to pick up seismic sound blasts than the one PG&E plans to use.

Sharon Shepherd  
241 N. Courtland St Apt 117  
Arroyo Grande CA 93420  
(805) 488-4038

Coastal Commission - Attn: Cassidy  
C/O Energy & Ocean Resources Censel

40 Fremont St August 23, 2012  
Suite 2000, SB Co 94108  
San, Ms,

Please do not do a seismic  
survey in our Ocean or any where  
else, as well as thank you for your  
attention to this matter. This is <sup>as</sup> very  
important for the whales, sea life, ocean & us.

Sharon H. Shepherd