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GEORGES BANK PROTECTION ACT

GOVERNMENT

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JOINT HEARING JUN 10 1980

BEFORE THE

COMMITTEE ON COMMERCE, FARRELL LIBRARY
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SCIENCE, AND TRANSPORTATION

AND THE

SUBCOMMITTEE ON ENERGY RESOURCES AND
MATERIALS PRODUCTION

OF THE

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

S. 2119

TO PROTECT THE FISHERIES RESOURCES ON THE GEORGES BANK,
AND FOR OTHER PURPOSES

MARCH 25, 1980

Serial No. 96-89

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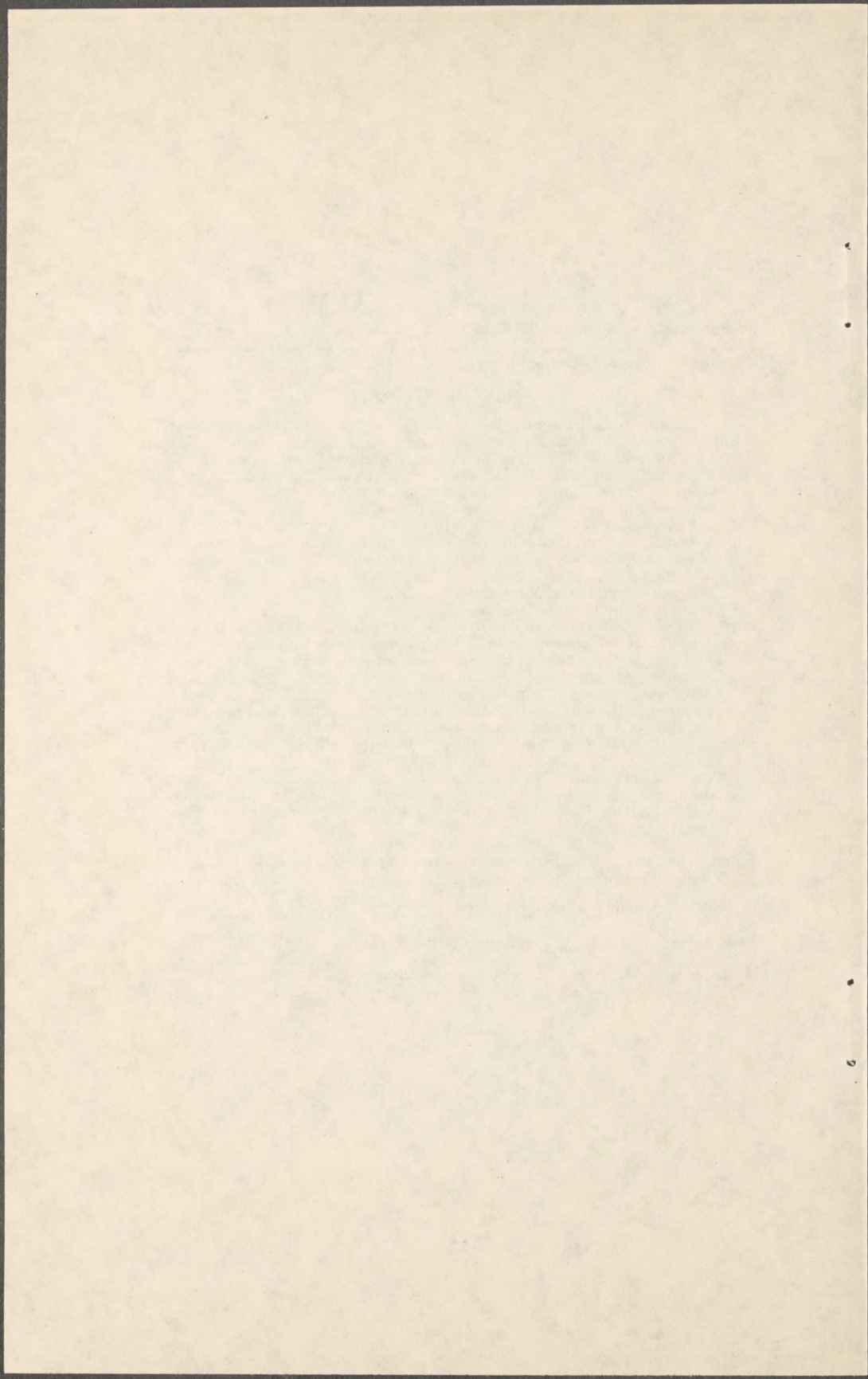
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GEORGES BANK PROTECTION ACT

TUESDAY, MARCH 25, 1980

U.S. SENATE, COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION, COMMITTEE ON ENERGY AND NATU-
RAL RESOURCES, SUBCOMMITTEE ON ENERGY RESOURCES
AND MATERIALS PRODUCTION,

Washington, D.C.

The committees and subcommittee met jointly at 9:30 a.m., in room 235, Russell Senate Office Building, Hon. Wendell H. Ford, Chairman of the Subcommittee on Energy Resources and Materials Production, presiding.

OPENING STATEMENT BY SENATOR FORD

Senator FORD. Good morning, ladies and gentlemen. This morning we are holding a joint hearing of the Subcommittee on Energy Resources and Materials Production and the Committee on Commerce, Science and Transportation. The subject of the hearing is the Georges Bank Protection Act, S. 2119.

While this legislation deals with only one offshore-oil and gas-leasing area, the conflicts which it addresses are common to many such areas. The basic question is always what is the proper balance between exploration and production of oil and gas, on the one hand, and the production and utilization of other resources on the other.

In passing the Outer Continental Shelf Lands Act amendments of 1978, the Congress recognized that such a balance must exist. Of course, there is always disagreement as to just what the balance should be, which is why we are here today.

As we all know, lease sale No. 42 on the Georges Bank was delayed for some time by litigation. It was finally held, on December 18 of last year, and exploratory redrilling is expected to commence this summer. In addition, the Interior Department's draft 5-year OCS leasing schedule calls for a second sale, No. 52, for the same area, in August of 1982.

However, the debate has not been stilled by these events. There remains a widespread concern regarding the efforts of long-term low-level exposure through drilling muds and formation waters as well as a fear for the possibility of a major oil spill.

The bill before us today does not seek to stop oil and gas drilling on the Georges Bank. I think we all realize that our present energy posture does not afford us this luxury. However, the question is open as to whether it is advisable to require additional precautions for the Georges Bank based on its long history of one of the world's most prolific fishing areas.

[The bill follows:]

96TH CONGRESS
1ST SESSION

S. 2119

To protect the fisheries resources on the Georges Bank, and for other purposes.

IN THE SENATE OF THE UNITED STATES

DECEMBER 11 (legislative day, NOVEMBER 29), 1979

Mr. TSONGAS (for Mr. KENNEDY) (for himself, Mr. MAGNUSON, Mr. TSONGAS, Mr. WILLIAMS, Mr. BRADLEY, Mr. HATFIELD, Mr. COHEN, and Mr. WEICKER) introduced the following bill; which was read twice and referred jointly, by unanimous consent, to the Committees on Commerce, Science, and Transportation and Energy and Natural Resources

A BILL

To protect the fisheries resources on the Georges Bank, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "Georges Bank Protection
4 Act".

5 SEC. 2. (a) With respect to any oil or gas activity in or
6 on the area known as Georges Bank (on the Outer Continen-
7 tal Shelf) the following requirements are imposed:

1 (1) All drill muds and cuttings shall be removed to
2 dumping sites approved by the Environmental Protec-
3 tion Agency unless the Secretary of the Interior, in
4 conjunction with the Administrator of the National
5 Oceanic and Atmospheric Administration determines in
6 writing that—

7 (A) meteorological conditions make such re-
8 moval more hazardous than onsite dumping; or

9 (B) onsite dumping would have no significant
10 detrimental effect upon biological populations at
11 such site or in adjacent areas; or

12 (C) another method of disposal should and
13 will be used which is less hazardous to the bio-
14 logical populations at such site or in adjacent
15 areas than barging.

16 (2) Formation waters shall be reinjected unless
17 the Secretary of the Interior in conjunction with the
18 Administrator of the National Oceanic and Atmospher-
19 ic Administration determines in writing that—

20 (A) the absence of such action will have no
21 significant detrimental effect upon biological popu-
22 lations at such site or in adjacent areas; or

23 (B) another method of disposal should and
24 will be used which is less detrimental to the bio-

1 logical population at such site or in adjacent areas
2 than reinjection.

3 (3)(A) A biological task force shall be appointed to
4 monitor the effects of oil and gas activity on biological
5 populations. Such task force shall consist of—

6 (i) one member appointed by the Fish and
7 Wildlife Service;

8 (ii) one member appointed by the United
9 States Geological Survey;

10 (iii) one member appointed by the Bureau of
11 Land Management;

12 (iv) one member appointed by the National
13 Oceanic and Atmospheric Administration;

14 (v) one member appointed by the Environ-
15 mental Protection Agency; and

16 (vi) one representative of the New England
17 Fishing Industry appointed by the New England
18 Fisheries Management Council.

19 (B) The biological task force shall make recom-
20 mendations with respect to the protection of biological
21 populations of the Georges Bank, to the Secretary of
22 the Interior, and such recommendations shall be imple-
23 mented by the Secretary of the Interior, unless, and to
24 the extent that, the Secretary of the Interior makes a
25 written determination that—

1 (i) such recommendations should not be im-
2 plemented on account of an overriding national in-
3 terest; or

4 (ii) adequate protective measures have been
5 taken to ensure the protection of the biological
6 populations of the Georges Bank.

7 (C) The biological task force shall exist so long as
8 there is oil and gas activity on Georges Bank.

9 (4) The President shall direct the appropriate
10 agencies to expedite the promulgation of the following
11 regulations:

12 (A) Safety regulations under section 21 of
13 the Outer Continental Shelf Lands Act (43 U.S.C.
14 1347).

15 (B) Enforcement regulations under section
16 22 of such Act (43 U.S.C. 1348).

17 (C) Fishermen's Contingency Fund regula-
18 tions under title IV of the Outer Continental
19 Shelf Lands Act Amendments of 1978 (43 U.S.C.
20 1841-1847).

21 (b) The President shall direct the appropriate Federal
22 agencies to expeditiously complete, and submit to Congress
23 and the biological task force, those reports relating to at-sea
24 spill cleanup and mitigation, mandated by the requirements of
25 the National Oil and Hazardous Substances Pollution Control

6

5

1 Plan (40 CFR 1510) and requested by the Senate during its
2 consideration of H.R. 4440, the Department of Transporta-
3 tion and Related Agencies Appropriation Act, 1980.

○

Senator FORD. We have a statement that I would like to enter into the record this morning by Senator Mark Hatfield. He is unable to attend, and I will submit that for the record.

[The statement follows:]

STATEMENT OF HON. MARK O. HATFIELD, U.S. SENATOR FROM OREGON

Mr. Chairman, together with Senators Weicker, Cohen, Bradley and others I am an original cosponsor of S. 2119, the Georges Bank Protection Act introduced by Senator Tsongas on behalf of Senator Kennedy. The bill establishes specific drilling safeguards for OCS oil and gas development off the coast of Massachusetts, Rhode Island and Connecticut in the rich fishing grounds of the Georges Bank.

As in any frontier OCS area, but particularly in Alaska and the Georges Bank, there is a special need to prepare drilling requirements which protect the fragile and, in some cases, only slightly known marine environment. While I would not halt OCS sales in frontier areas, I do believe that safety and pollution prevention must be priority concerns and that rigid requirements of OCS lessees and drilling operators must be made.

The Georges Bank Protection Act, S. 2119, with a few changes which I will recommend, ensures that reasonable environmental protections and safety precautions will become an integral part of drilling operations on the Georges Bank.

Of course it may occur to the Department of the Interior that drilling requirements such as those in S. 2119 should be included in the permits issued under the general protective authority provided the Department in existing law and spelled out in the lease stipulations. In that event legislation would probably not be necessary.

In any event, it is important to stress the positive safety and environmental record of OCS development over the years. The 1969 blowout in the Santa Barbara channel has taught us much about the need for vigilance in OCS protection and tough drilling standards. The Campeche Bay blowout off Mexico's Gulf Coast, for example, could not have happened in U.S. waters, and the overwhelming probability, 95.5 percent according to Interior's EIS, is that no significant spill will occur on the Georges Bank. Our drilling requirements are far more exacting and protective, and our lessees and operators have acquired a great deal of experience in their implementation. Expert witnesses appearing before the Energy Committee last session agree in this assessment.

I have three recommendations which I feel would improve the Georges Bank Protection Act: (a) The Secretary of the Interior should be able to act without the Administrator of NOAA in determining certain exemptions from barging drill muds and cuttings. The Secretary has in the past and will continue to consult with NOAA concerning meteorological conditions which may make barging too hazardous and concerning pollutants from drilling operations affecting our nation's fisheries. But to require the Interior Secretary to make decisions with the Administrator of NOAA in the areas of disposal methods for drilling muds and cuttings and reinjection of formation waters presumes an expertise which NOAA does not have. (b) The composition of the Biological Task Force established in the bill to monitor the effects of oil and gas activity on Georges Bank fish populations should certainly include a representative of the industry's environmental scientists. The Secretary of the Interior could appoint this member, and this addition would increase the task force size to seven. (c) The recommendations of the Biological Task Force to the Secretary of the Interior should be advisory, like all other existing secretarial advisory boards, and not compulsory. The Secretary's responsibility in managing the OCS and its resources is broader than the range of concerns of the Task Force which, by design, takes a much narrower view in making assessments. The Secretary cannot be bound by such a narrow view.

I have heard several other potential problems with the proposed Georges Bank Protection Act, but I am not sure at this time of their significance. One, for example, is that of the International Association of Drilling Contractors, which has noted that the cost of barging drilling muds and cuttings away from the area of operation may equal the cost of drilling muds. That is, barging might be double the existing costs without significantly reducing any adverse impacts. A more general critique of the bill has concluded that the legislation prejudices the need for barging before research has indicated that harm will be done and that this prejudgement may unnecessarily limit the Secretary's flexibility in managing OCS leasing and operations. These concerns should be reviewed in today's hearing.

Public controversy has been high throughout the debate on whether or not the Department of the Interior should sell lease tracts on Georges Bank. But a little less

exaggeration and emotionalism in discussing oil and gas development on the Bank would help the Government, the companies operating on the leased tracts, and, most of all, the public. For example, before the lease sale, the CBS Evening News characterized the probability of a major spill at Georges Bank as "40 percent". According to the Final EIS for Sale No. 42 and statistics accrued over the life of OCS production in the U.S., the probability of such a blowout is actually around 0.5 percent.

Other examples of misinformation abound. The importance of Georges Bank as a commercial fishing ground to New England and to the world certainly should not be understated. But there have been numerous and gross overstatements concerning the commercial fishing of Georges Bank and the potential impacts of OCS oil and gas operations on it, such as: "It's by far the richest fishing ground in the world * * *", "* * * renewable food resource—worth at least a billion dollars a year every year", and "* * * the source of 14 percent of the world's annual fishing harvest * * *"; coupled with statements implying that a massive crude oil spill is inevitable in the Georges Bank area, would most likely decimate the fishing grounds and fisheries, and would equate to the toxicity of spilling refined petroleum products. If we are to attempt to keep the public informed on what the OCS has to offer our energy future and the environmental consequences and risks of OCS activities, we must deal in facts.

The Georges Bank, important as it is, does not produce 14 percent of the world's fishing harvest, nor does it produce one billion dollars a year in fisheries, nor is it the richest fishing ground in the world.

In the 1930's, the Georges Bank was indeed the premier fishing ground, but this is no longer the case.

In 1978, which showed the highest annual fisheries yield for the nation since 1962, the Louisiana catch was ranked first, Alaska second, and California third. All were over 700 million pounds. The U.S. catch on Georges Bank (without shells) was estimated at 183 million pounds, worth about \$90 million, with the world catch on Georges Bank about twice that.

The total marine fishery among all nations was about 160 billion pounds (including shells) in 1978, which made the world catch on Georges Bank about one-half of one percent.

The U.S. has been ranked fourth or fifth in commercial fishing catches among all nations for the past several years. At about 7.7 billion pounds, the U.S. catch was less than 5 percent of the world harvest in 1978. The American Georges Bank catch was therefore about two-tenths of one percent of total world harvest.

Last year the Georges Bank came under consideration as a potential marine sanctuary because of the number of nominations it received from concerned citizens in New England. A NOAA study which initiated the concern in 1979 resulted in an agreement between the Department of the Interior and NOAA to go ahead with the sale, provided certain stipulations were included in the lease.

One of the stipulations that the Department of the Interior agreed to in its consultation with NOAA was to delete certain tracts from the lease sale. The deleted tracts were the most sensitive in the proposed sale area because of their close proximity to certain marine habitats, including breeding grounds. Because of the deletion of these tracts, the probability that any oil spill will harm the shoreline or the reproduction of marine species has been drastically decreased from original projections.

The U.S. record of safety on the OCS is enviable, and the probability of blowouts continues to decrease as technology improves. It also decreases as additional wells are drilled in a specific lease area. However, the probability cannot be reduced to absolute zero. There will always be a chance of an occurrence.

In debate over economic and biological effects of a blowout, it should be understood that there is a significant and important difference in impact between a spill of refined petroleum product and a spill of crude oil. Tanker accidents with refined products are big villains, not well blowouts of crude oil. The toxicity and potential biological destruction from a refined product cannot be equated with crude oil. Many arguments that have appeared in the media have tacitly assumed an equivalence. While refined products and crude oil are anatomically similar (they both contain carbon and hydrogen), crude oil does not have the same molecular construction as a refined product. It is the new molecules made by the refining process that makes petroleum products so potentially lethal. For this reason, arguments that are put forth involving the potential danger of a spill involving No. 2 heating oil (the *Falmouth* spill) and No. 6 heating oil (the *Argo Merchant* spill) are not applicable to a discussion on effects of crude oil.

The OCS contains, depending on whom you consult, from 32 percent to 60 percent of our nation's remaining oil resources. OCS activities not only offer a partial solution to our undesirable imports dependence, but already return three billion dollars annually to the Treasury in leasing and royalty payments.

The attractiveness of OCS development continues to improve as our environmental and safety record also improves. Drilling requirements such as those recommended in the Georges Bank Protection Act, S. 2119, attempt to ensure that this environmental record remains strong.

Senator FORD. Senator Cannon?

OPENING STATEMENT BY THE CHAIRMAN

The CHAIRMAN. Thank you, Mr. Chairman. On February 29, 1980, the Commerce Committee, the Energy Committee, and the Small Business Committee held joint hearings in Boston on the effects of oil and gas development on New England fisheries. Of particular concern were the ramifications of lease/sale No. 42 on Georges Bank, which was held in December 1979, with exploratory drilling due to begin this summer. The Department of the Interior has also begun the tract nomination process for lease sale No. 52, scheduled for 1982; and covering essentially the same area as did No. 42.

The key issue is one of balance between the acknowledged need for oil and gas development and adequate protection for one of the oldest and most productive fishing industries in the world. Drilling is expected to begin on the Bank this summer despite the following disturbing facts:

One: The mineral resources for lease/sale No. 42 on Georges Bank are estimated at 123 million barrels of oil and 870 billion cubic feet of gas over the 20-year life of the field. At current U.S. consumption rates, this is equivalent to about 6 day's supply. On the other hand, Georges Bank is one of the most productive fisheries in the world. Some estimates say the Bank produces about 17 percent of the foodfish landed annually in the United States, supporting a \$1 billion per year fishing industry in New England alone.

Two: Both the Coast Guard and private industry testified that equipment does not exist to clean up or contain an oil spill in the Bank area.

Three: NOAA and EPA acknowledge that the baseline scientific data is inadequate to predict the consequences of either a major spill or of chronic long-term effects of oil and gas activity on the fisheries of Georges Bank. Further, there is disagreement as to the effects of drilling effluents on the biota. The special lease stipulations for No. 42 call for some studies into this but drilling activities are scheduled to begin before the studies are completed.

Four: Both NOAA and EPA have expressed reservations about proceeding with the lease/sale. NOAA, while withdrawing its objections because of the negotiated agreements with the Department of the Interior, refused to endorse the sale until further resource and environmental studies are done to assess the risks.

Five: Experts agree that a spill of the magnitude of Campeche Bay would irreparably damage the Georges Bank area's future fisheries resources. Because of the relatively shallow waters on the Bank and the circular rotating currents and spill or contaminant would remain essentially in the fishing area unlike other ocean

areas in which pollutants would be more greatly diluted and dispersed by ocean currents.

In light of the rather low estimates of oil from Georges Bank, one wonders about the wisdom of the decision to proceed with the leasing until more is learned. To explore prematurely, before proper precautions are taken and adequate data are available, could have a disastrous effect on a world-renowned fishery.

The legislation before us today is a further attempt to protect those resources. It in no way delays or prevents the proposed development. It merely provides for stricter environmental safeguards and gives force of law to an agreement already in place for a biological task force. The administration, through DOI, maintains that this is not needed that the OCS Lands Act as amended gives them sufficient authority to protect other resources. However, Congress also passed the National Environmental Policy Act, Coastal Zone Management Act, and Fishery Conservation and Management Act. The Fishery Conservation and Management Act was enacted in large part to protect the Georges Bank fishery. It is nowhere suggested that Congress expected or desired oil and gas leasing to go forward under conditions or in particular locations where serious and permanent damage to other important resources would result.

The question we must ascertain is, how best to balance the two activities. The legislation we consider today may be one step in that direction in the particular context of this unique area of Georges Bank. This would appear to be a small investment for maximum return.

I want to thank the witnesses for coming today, especially those of you having to travel. The committees look forward to your testimony and your response to the important questions before us.

Thank you, Mr. Chairman.

Senator FORD. Thank you Senator Cannon. The first witness this morning will be Vice Adm. Robert H. Scarborough, U.S. Coast Guard.

**STATEMENT OF VICE ADM. ROBERT H. SCARBOROUGH, VICE
COMMANDANT, U.S. COAST GUARD; ACCOMPANIED BY CAPT.
CHARLES R. CORBETT, CHIEF, COAST GUARD MARINE ENVIRON-
MENTAL PROTECTION DIVISION**

Admiral SCARBOROUGH. Good morning, Mr. Chairman, and members of the committee. I am Vice Adm. Robert H. Scarborough, Vice Commandant, U.S. Coast Guard. With me today on my right is Capt. Charles R. Corbett, Chief of the Coast Guard's Marine Environmental Protection Division. Thank you for the opportunity to present the Coast Guard's views on activities associated with Georges Bank area of the Outer Continental Shelf and this committee's interest in protecting the valuable biological resources of that region.

I know that a prime concern of this committee is the assurance that adequate contingency measures have been or will be taken in respect to the potential for oil spills which may occur as a result of exploratory activities on Georges Bank. The Coast Guard shares that concern. I can assure you, Mr. Chairman, we will continue our

enforcement, surveillance, monitoring, and if necessary, response activities.

As you are aware, the Coast Guard has interest and involvement in OCS activities through our legislatively mandated mission areas of commercial vessel safety, port safety, marine environmental protection, and fisheries conservation management, including the enforcement of various national and international laws and treaties in the same areas.

The Federal Water Pollution Control Act, as amended, and the Outer Continental Shelf Lands Act Amendments of 1978 have created overlapping authorities between the U.S. Geological Survey, Environmental Protection Agency, and Coast Guard for the prevention and curtailment of pollution resulting from OCS activities. In November 1978, the three agencies established a working group for the development of a memorandum of understanding (MOU) to coordinate the promulgation and enforcement of pollution prevention regulations and other government requirements as they relate to offshore facilities. Although the MOU is not yet fully developed, tentative agreement has been reached within the working group concerning response equipment and contingency planning requirements. In effect, the Coast Guard will establish recovery equipment, response time and spill exercise standards, and the USGS will insure that these standards are met. This will occur through the Coast Guard's review of industry contingency plans and equipment inventories prior to approval for actual drilling.

Independent of the preparation of the MOU, the USGS oil and gas supervisor for the North Atlantic region has contacted the Marine Environmental Protection Division at Coast Guard Headquarters and requested assistance in the development of pollution preparedness requirements for exploratory drilling on the Georges Bank. Our Marine Environmental Protection Division has agreed to supply input, but has informed the supervisor that the First Coast Guard District representatives in Boston must participate in the preparation of the requirements in order to insure that local considerations are weighed carefully.

The supervisor has not yet approved any spill contingency plans for lease sale No. 42, nor has he submitted any to Coast Guard Headquarters for review. However, the Commander, First Coast Guard District, has begun development of the review process, involving other concerned agencies within our national response mechanism which, of course, includes the States. We intend to apply the same response equipment and contingency planning guidelines to the lease sale No. 42 operations as we believe will be contained in the MOU.

We believe that the oil containment and recovery equipment required must be "state-of-the-art." Based on past Coast Guard research and development studies and observations made at the Bay of Campeche, well site recovery operation, we believe an effective operation is possible in 8- to 10-foot seas and in winds in excess of 20 knots, provided of course that the operation is sufficiently near the source to insure good availability of oil.

The quantity of equipment that must be available should be related to the spill threat. However, a recovery capacity of at least

1,000 barrels per day should be the minimum recovery rate acceptable.

A time of 6 hours for initiating recovery operations with pre-staged equipment will be our target. That is, whatever amounts of equipment are required to be available for responding to spills should be fully deployed and in operation within 6 hours of the time the spill occurs, weather permitting. Where equipment is to be staged will be left to the operator. But, he must demonstrate that response target criteria can be met under all conditions under which the equipment is expected to be operated. Within 48 hours after a spill, an operator would be expected to bring in other equipment required to cope with the spill of extraordinary dimensions.

We also believe that response exercises must take place at least semiannually. The exercises must be structured to test the response mechanism under the same demanding environmental conditions in which it is expected to be effective, that is, 8- to 10-foot seas. Vessels capable of deploying and operating response equipment must be available within the same response time parameters as used for response equipment. The crews of all candidate support vessels must be familiar with equipment deployment and operating techniques or a system developed for supplying trained crews and supervisors to the involved vessels within the specified response time.

In addition to all recovery equipment, offshore operators must be required to maintain equipment for applying dispersants and adequate stockpiles of dispersants, if these are not readily available from distributors. This requirement should not be interpreted as a preference on the part of the Government for the use of dispersants. Instead, it recognizes that spills may well occur in which the mechanical removal of oil is not possible due to environmental conditions or the lack of adequate support vessels. Under circumstances such as these, it is desirable that all options be available. The decision to use dispersants would of course be made using the criteria and procedures set forth in annex X of the National Contingency Plan.

Mr. Chairman, in your invitation to attend this hearing you asked specifically about the arrangements being made with Clean Atlantic Associates to respond in any way to an oil accident on Georges Bank. As my representative, Captain Corbett recently observed a presentation by this oil spill response consortium in Boston, Mass. Though we have not yet received any proposed spill contingency plans for the Bank, it seems fairly certain that Clean Atlantic will play a major role in those plans and, if required, in oil spill response.

In summary, Mr. Chairman, the Coast Guard will continue to work closely with the several Federal and State agencies in the development of contingency measures necessary for the protection of offshore assets and for timely and effective response to spills should that need arise. I thank you and the committee members for allowing the Coast Guard to participate in these proceedings.

I will be happy to address any questions you or the other members may have.

The CHAIRMAN. Admiral, you mention that state of the art technology on barriers is used in 8- to 10-foot seas. Yet we have been told that the conditions on Georges Bank frequently exceed that.

I would like to ask you, is there equipment to deal with those conditions in existence, either in industry or the Coast Guard? Is there equipment on order to deal with contingencies of that magnitude?

Admiral SCARBOROUGH. Senator Cannon, there is equipment to deal with the conditions I stated, 8 to 10 feet. It's my understanding that these sea conditions occur approximately 10 percent of the time on the Georges Bank.

The CHAIRMAN. When you say "these," are you referring to the 8- to 10-foot seas?

Admiral SCARBOROUGH. Eight-to-ten-foot weather conditions.

The CHAIRMAN. Ten percent?

Admiral SCARBOROUGH. We do have equipment which will operate in the 8- to 10-foot seas or, in other words, to some extent, 90 percent of the anticipated weather conditions.

The CHAIRMAN. But what about the other 10 percent?

Admiral SCARBOROUGH. We have no equipment that we feel can operate in excessive weather conditions, and to our knowledge, none exists. There will be certain weather conditions at sea, sir, that people just cannot operate.

The CHAIRMAN. None exist in private industry today, either?

Admiral SCARBOROUGH. To our knowledge, no, sir; either nationally or internationally.

The CHAIRMAN. If any were to be ordered, how long would it take to bring equipment on stream to handle something in excess of 10 foot seas?

Admiral SCARBOROUGH. This equipment would have to be developed. How much in excess? Obviously, in hurricane conditions, even a well-found ship has difficulty surviving. So there will be some limit of weather in which it will never be feasible to design any equipment to pick up oil.

Conceivably, we could exceed what our present capabilities are—to what limit is unknown—whether to 15-foot seas and thereby include a capability 98 percent of the time, or whatever; but there is some limit beyond which we cannot go.

The CHAIRMAN. You are representing the agency responsible for coordinating cleanup activities; what do you recommend then, with respect to drilling?

If you say there is not equipment available currently to handle 10 percent of the seas in that area, and drilling is scheduled to start this summer, can you recommend that drilling go ahead when you don't have the capability to address that 10 percent?

Admiral SCARBOROUGH. Senator Cannon, of course this is really not a determination for the Coast Guard to make. It's a judgment factor. We are dealing—as we do in many things, many areas of our operations—with probabilities. And balancing all that, in my personal opinion—and I think I can speak for the agency in this regard—I would deem it to be a reasonable risk.

This is not to say that it is still not a risk, and conceivably some day there might be a disastrous situation which we can't control.

But I would think that odds being what they are, that it is a reasonable risk.

And from the standpoint of concern for cleanup in the event of a spill or a blowout, I would have to, from that standpoint alone, I would have to recommend that we proceed.

I, of course, have no expertise in any other of the many consideration areas.

The CHAIRMAN. Do we have a bilateral cleanup agreement with Canada?

Admiral SCARBOROUGH. Yes, sir.

The CHAIRMAN. Can you supply the details of that for the record?

Admiral SCARBOROUGH. I can indeed. It's a quite effective agreement, sir. I have operated with it in the Great Lakes area.

[The following information was subsequently received for the record:]

LETTER OF PROMULGATION

The Joint Canada-United States Marine Pollution Contingency Plan for Spills of Oil and Other Noxious Substances is intended to supplement and to adapt internationally other approved national, provincial, state and local pollution contingency plans. Developed by a United States-Canada Working Group, this Plan provides response mechanisms for any pollution incident which constitutes a significant threat to the waters and coastal areas of both Parties.

The Parties are aware that the public must play a considerable part in the warning and reporting systems which are contained within the Plan and they agree that these methods should be brought to the attention of the public at periodic intervals. In addition, the Parties recognize that certain elements of both public and private sectors can contribute substantially to the orderly and successful implementation of the Plan and therefore agree that it should be accorded the widest distribution.

The Plan is approved for implementation and operations. Annexes covering specific geographic areas may be added and approved as required by agreement between the Parties.

For the United States Coast Guard:

For the Ministry of Transport:

JUNE 20, 1974.

ABSTRACT OF THE PLAN

1. The plan

The Joint Canada-United States Marine Pollution Contingency Plan for Spills of Oil and Other Noxious Substances covering specific geographic areas where they may be a significant threat to the waters and coastal areas of both Parties has been approved for implementation.

2. The purpose

The purpose of the Plan is to provide for coordinated and integrated response to pollution incidents by federal, state, provincial and regional plans of both Parties.

3. The objectives

The objectives of this Plan are:

(a) to develop the appropriate measures of preparedness and systems for the discovery and reporting of a pollution incident within the areas covered by the various Annexes to the Plan;

(b) to institute prompt measures to restrict the further spread of oil or other noxious substance; and

(c) to provide adequate resources to respond to a pollution incident.

A pollution incident is defined as a spill or the threat of an imminent spill of oil or any other noxious substance of such magnitude or significance as to require an immediate response to contain, clean-up and/or dispose of the substance in order to remove the threat to or to minimize the adverse effect on the public health or welfare.

4. The procedures

The Plan provides for pre-designated On-Scene Commanders and Deputy On-Scene Commanders who will coordinate the response activities to control a spill and for Joint Response Teams to provide advice and assistance to the On-Scene Commanders. It establishes alerting and notification procedures, command structure, post clean-up requirements and arrangements for assuming the responsibility for the cost of operations.

5. Responsibility

The implementation and maintenance of the Plan is the joint responsibility of the United States Coast Guard, Department of Transportation and the Canadian Marine Transportation Administration, Ministry of Transport. The two aforementioned organizations are the lead agencies and shall be assisted by other national agencies as appropriate and when required. The two lead agencies are empowered to amend jointly the Plan as necessary subject to the proviso that any amendment shall be consistent with the purpose and objectives as agreed to by both Parties in Annex 8 of the Canada-US Agreement on Great Lakes Water Quality.

100 INTRODUCTION

101 Background

101.1 The need for a joint U.S.-Canada pollution contingency plan for the Great Lakes was pointed out by the International Joint Commission (IJC) in their "Special Report on Potential Oil Pollution, Eutrophication, and Pollution from Watercraft", dated April, 1970. This report recommended that "the two Governments under the general aegis of the International Joint Commission arrange for the development of a coordinated international contingency plan so that both countries may quickly and effectively respond to major accidental spills of oil or other hazardous materials in the boundary waters of the Great Lakes system".

101.2 At the June 23rd, 1970 meeting of ministers in Ottawa, a U.S.-Canada Joint Working Group on Great Lakes Pollution was created to coordinate various U.S.-Canada pollution control programs. The original Plan and Annex One were developed by a contingency planning sub-group with representatives from Canada and the United States.

101.3 The development of this Plan was consistent with the intent of the IJC report on Great Lakes pollution dated December, 1970, which recommends, among other things, that "the Governments of Canada and the United States enter into agreement to develop coordinated international contingency plans so that both countries may quickly and effectively respond to major accidental spills of oils, hazardous or radioactive materials in the boundary waters of the Great Lakes System". This Plan was incorporated into the Canada-US agreement on Great Lakes Water Quality which was signed by the Prime Minister and the President on 15 April, 1972.

101.4 Following upon introduction of an international contingency plan for the Great Lakes, it was agreed that there was a need to establish joint contingency plans for waters of mutual interest where the use of combined resources would improve the posture and capability of each nation.

102 Purposes and objectives

102.1 This Plan provides for coordinated and integrated responses to pollution incidents in the waters designated in the Annexes and their appendices to the plan by responsible federal, state and local agencies in the U.S. and federal, provincial and local agencies in Canada. It is intended to augment the national, state, provincial and regional plans of the two Parties and therefore addresses itself primarily to international matters not covered by these plans.

102.2 The objectives of this Plan are:

- (a) to develop appropriate preparedness measures and effective systems for discovering and reporting the existence of a pollution incident within the areas covered by various Annexes to the Plan;
- (b) to institute prompt measures to restrict the further spread of oil or to minimize the hazard posed by a noxious substance; and
- (c) to provide adequate resources to respond to a pollution incident.

103 Scope

103.1 This Plan applies to the areas specified in its Annexes.

103.2 This Plan and its Annexes are applicable whenever a pollution incident may affect both Parties or, although only directly affecting one Party, is of such a magnitude as to justify a call on the other Party for assistance. It is intended to

organize the activities of all the responsible authorities in each country, and to provide a command structure and an established method of operation for the forces engaged in dealing with any one incident.

200 JOINT POLICY AND RESPONSIBILITY

201 *Joint policy*

201.1 The appropriate U.S. and Canadian agencies will cooperate as fully as possible to respond expeditiously to a pollution incident that affects or threatens to affect both Parties. Actions taken pursuant to the plan shall be consistent with the statutory authorities, operational requirements and other obligations of each of these Agencies.

201.2 It is recognized that good across-the-border communications between all levels of government are vital to the successful implementation of this Plan. Any pollution incident that presents a potential threat to the other Party shall be reported promptly to the appropriate agency of that Party in accordance with the provisions of this Plan.

201.3 In a response situation which falls within the scope of this Plan, the designated agencies shall make available any resources they may have which could be used for joint response operations, subject to the exigencies in their national area. In addition, each Party shall have available a mechanism whereby the necessary resources from the public and private sectors may be brought to bear to achieve a successful outcome to a joint response operation.

201.4 In response actions, the use of dispersants, sinking agents or other chemicals is not authorized except when their use will, in the judgment of the On-Scene Commander (OSC):

- (a) prevent or substantially reduce the hazard to human life or limb or unacceptable hazard of fire to property;
- (b) prevent or reduce a threat to a major population segment of a vulnerable species of water fowl; or
- (c) appears to be the most effective means by which to reduce the total impact of a spill, in which case only those materials authorized by EPA or DOE are to be used.

202 *Special arrangements for funding and entry*

202.1 Unless otherwise agreed, the following funding arrangements shall apply. When a pollution incident occurs in the internal waters of a party, or its territorial sea and contiguous zone waters up to twelve miles seaward of the baseline from which its territorial sea is measured, that Party shall bear the costs of:

- (a) response operations by its own government forces;
- (b) such private resources as are properly arranged for by the OSC and are approved by such Party; and
- (c) response operations by the Government forces of the other Party in the first Party's internal waters and in the first Party's territorial sea and contiguous zone waters up to twelve miles seaward of the baseline from which its territorial sea is measured.

In the case of the Great Lakes, the provisions of Annex 8 of the Great Lakes Waters Quality Agreement will apply.

In the case of pollution arising from seabed activities, the cost of response operations shall be borne by the Party having jurisdiction over the seabed activities involved.

In all other cases subject to this Plan, each Party will bear the costs of its own response operations.

202.2 The recovery of costs expended for response activities shall be considered on a case by case basis. This Plan is not related to and shall not prejudice the resolution of any dispute which may arise respecting liability and compensation for damages resulting from any pollution incident wherever it may occur.

202.3 When this Plan and its Annexes are invoked, special customs and immigration clearances will be granted by each Party for response resources including personnel and equipment.

203 *Mechanism for invoking the plan*

203.1 The Plan may be invoked by the responsible Canadian or U.S. official (see section 302.2) in the event of a pollution incident which originates within the area of responsibility of his on-scene commander and which is accompanied by a substantial threat of the spread of a pollutant into the area of responsibility of the other Party's OSC, or where such spreading has already occurred, or by the responsible Canadian or U.S. official (see section 302.2) in the event of such a pollution incident originating within the area of responsibility of the other Party's OSC.

203.2 The Plan may be invoked in pollution incidents where no spread of pollutants into the area of responsibility of the other Party's OSC has occurred or is threatened, but where the magnitude of the incident, or other factors, makes a joint response desirable. In such cases the agreement of the responsible officials of both Parties is required.

204 U.S. Federal agencies' responsibilities

204.1 Various U.S. Federal Agencies have responsibilities established by Statute Executive Order or Presidential Directive which may bear on the joint response to a polluting spill. Responsibilities and authorities of these several Agencies relevant to the control of pollution incidents are further detailed in the National Contingency Plan.

205 Federal Canadian agencies' responsibilities

205.1 The Ministry of Transport is the Canadian Agency responsible for the operation, administration and maintenance of this Plan. Within the Ministry, a Marine Emergency Office has been established in Headquarters and the regions. If the incident warrants, this Office will provide the OSC and the Canadian chairman of the J.R.T. as well as M.O.T.'s spill clean-up and control equipment.

205.2 The Department of the Environment, through its Environmental Protection service, will provide technical advice to the JRT relative to ambient water quality and water pollution control techniques, marine environmental data including living resources, meteorological, hydrological and oceanographic conditions.

205.3 The Department of Energy, Mines and Resources, through its Resource Management and Conservation Branch, has statutory responsibility for the federal interest in the mineral resources off Canada's coasts. This responsibility includes the administration and regulatory control over seabed activities. Other agencies in the Department will provide the JRT with expert knowledge in the earth science fields.

205.4 The Department of National Defence, through its Commands and subject to established priorities and its operational requirements, may provide such resources and facilities as are available.

205.5 The responsibilities of the several provincial and state agencies are contained in the appropriate Annexes.

300 PLANNING AND RESPONSE ELEMENTS

301 Joint response centers

301.1 The Joint Response Centre (JRC) will be established in the facilities of the Party providing the OSC and will ordinarily be shifted to the facilities of the other Party if the OSC is shifted to that Party.

302 Joint response teams

302.1 The Joint Response Teams (JRT) shall consist of representatives of certain agencies of the U.S and Canada. They function as emergency teams and will be activated by agreement in the event of a pollution incident occurring within the areas encompassed by this Plan and its Annexes. A JRT may be activated for any other location which may be designated.

302.2 The United States Coast Guard member of a JRT will act as U.S. chairman when the JRC is established in the U.S.A., and the Canadian Regional Coordinator under the extent Federal Contingency Plan will act as Canadian chairman of the team when a JRC is established in Canada. The chairman of either Party may invoke the Plan (see section 203).

302.3 The functions of a JRT include planning, preparedness and response and are outlined below. These are not exclusive.

(a) Develop procedures to promote a coordinated response by all agencies to pollution incidents.

(b) Review post-incident reports from the OCS's on the handling of pollution incidents for the purpose of analyzing response actions and recommending needed improvements in the contingency plans.

(c) Forward to the respective federal, state and provincial authorities relevant reports and recommendations including OSC's post-incident reports, JRT debriefing reports and recommendations concerning amendments to the Plan or the Annexes.

302.4 Some measure of response functions will be performed each time the Plan is invoked. The degree of response will be subject to the demands of each particular situation. The specific response functions and responsibilities of the JRT are outlined below.

(a) Monitor incoming reports and evaluate the possible impact of reported pollution incidents. To be at all times fully aware of the proposed actions of the OSC.

(b) Coordinate the actions of the various agencies in supplying the necessary resources and assistance to the OSC. Assistance will normally be obtained through the appropriate member of a JRT.

(c) Provide advice as required to the OSC. The JRT does not have operational control over the OSC.

(d) May arrange the deployment of personnel to monitor the handling of the spill.

(e) Recruit other agencies, industrial or scientific groups to play their appropriate parts in support actions by acting through the JRT or OSC.

(f) Determine when a shift of OSC from one party to the other is indicated by the circumstances of the spill.

(g) Provide a focal point for public information.

(h) Coordinate the reporting on the status of the pollution incident to the respective national authorities.

302.5 The national chairman of the several JRT's shall make provision for periodic meetings of a JRT to discuss mutual problems; and, as appropriate, for the conduct of exercises relating to this Plan.

303 On-scene commander

303.1 The coordination and direction of the joint pollution control efforts as the scene of a pollution incident shall be achieved through an official appointed as the On-Scene Commander (OSC). The OSC is an agent designated in each of the Annexes to the Plan for the appropriate area in which a pollution incident may occur. His responsibility will continue until a shift in OSC's between the Parties is agreed upon by the JRT in accordance with section 302.4(f) above, or until a shift in OSC's within the jurisdiction of one Party is directed by the chairman of the JRT or other national authority.

303.2 In the event of a pollution incident, the first official arriving at the site shall assume coordination of activities under the Plan until the designated OSC becomes available to take charge of the operation.

303.3 The OSC shall determine the pertinent facts about a particular pollution incident, including the nature, amount, and location of material spilled, probable direction and time of travel of the material, resources available and needed and the installations which may be affected. He shall establish the priorities for protection.

303.4 The OSC shall initiate and direct, as required, Phase II and Phase III operations as hereinafter described.

303.5 The OSC shall call upon and direct the deployment of available resources to initiate and continue containment, countermeasures, clean-up, and disposal functions.

303.6 In carrying out this Plan the OSC is to maintain an up-to-date and accurate information flow to the JRT to ensure the maximum effectiveness of the joint effort in protecting the natural resources and environment from pollution damage. The necessary direct liaison between personnel at all levels in the agencies of both countries is essential to both satisfactory planning and operations.

303.7 Upon instructions from a JRT, an OSC, assisted by the Deputy On-Scene Commander (DOSC), is to submit to that team such reports and recommendations on any one incident, as a JRT may deem to be necessary.

304 Deputy on-scene commander

304.1 The Deputy On-Scene Commander shall be the appropriate designated OSC from the Party which is not providing the OSC. He shall act as the OSC's direct liaison with the agencies of the Party which he, the DOSC, represents. He shall assist the OSC and shall control his own Party's response resources to comply with the planned tactics of the OSC.

400 RESPONSE OPERATIONS

400.1 The actions which are taken to respond to a pollution incident separate into four relatively distinct phases. However, elements of a phase on an entire phase may take place concurrently with one or more other phases.

Phase I—Discovery and Alarm

Phase II—Evaluation and Plan Invocation

Phase III—Containment and Countermeasures

Phase IV—Clean-up and Disposal

401 Phase I—discovery and alarm

401.1 The discovery of a pollution incident may be made through the normal planned surveillance activities, through the observations of agencies of the various

levels of government, by those who caused the spill or by the alertness and concern of the general public.

401.2 The severity of the spill, which in itself is conditioned by the nature and the quantity of the pollutant and the locality, will determine the level of response required and whether or not there is a need to invoke the Plan.

401.3 The first agency, having a responsibility under the Plan, to be made aware of a pollution incident shall notify the appropriate designated OSC immediately. If the pollution incident threatens to affect the area of responsibility of the other Party's O.S.C. a suitable and speedy warning is to be given in accordance with the procedures established in the Annexes.

402 Phase II—evaluation and plan invocation

402.1 If it is the evaluation of the OSC receiving the first warning that the pollution incident will possibly affect the other Party and/or is more than a minor spill, he shall:

(a) make a recommendation to his own national chairman of the JRT on whether to invoke the Plan.

(b) formulate plans to deal with the situation, and

(c) initiate Phase III and IV actions as appropriate.

The chairman may invoke the Plan as provided in section 203. The specific methods for warning the other Party and invoking the Plan are contained in each Annex.

403 Phase III—containment and countermeasures

403.1 Containment is any measure, whether physical or chemical, which is taken to control or to restrict the spread of a pollutant.

403.2 Countermeasures embrace those activities, other than containment, which are implemented to reduce the impact and the effect of a pollutant on the public health and welfare.

404 Phase IV—cleanup and disposal

404.1 This phase of the operation is directed towards reducing the impact of a spill as much as possible. It will include the removal of the pollutant from the water and shoreline using available technology.

404.2 Pollutants which are received as a result of clean-up actions shall be disposed of in accordance with national procedures so as to preclude the possibility of further or continuing environmental damage.

500 PUBLIC INFORMATION

501 Introduction

501.1 When a pollution incident occurs, the public must be provided with timely and accurate information on the nature of the incident and the steps which are being taken to cope with the problem. This policy is followed to obtain understanding from the public, to ensure cooperation from all interested parties and to reduce the possibility of the spread of concern or alarm through misinformation.

502 JRC news office

502.1 When the Plan is invoked, the chairman will make the appropriate arrangement to assign, from the resources of each Party, a professional information officer who will establish and direct a News Office at the activated JRC. Each of these co-directors of the JRC News Office shall maintain liaison with the interested parties in his own country, including the press, government press offices and concerned industries. All news releases involving policy considerations shall be cleared by or through the chairman and such other representatives of the Parties as the chairmen deem necessary. SITREPS and other factual releases will not normally require formal clearance by the chairmen. The co-directors of the JRC News Office should attend the meetings of the JRT and should be consulted on public reactions. The Party providing the site for the JRC shall supply adequate space, equipment, and manpower for the JRC News Office.

503 On-scene news office

503.1 When the plan is invoked, the chairmen will appoint to the staff of the OSC and DOSC a professional public information officer from the resources of each Party to establish and direct a news office near the headquarters of the OSC. These co-directors of the On-Scene News Office shall work under the OSC and DOSC and shall be responsible for preparing and clearing joint news releases, keeping the JPT advised of their activities, maintaining an account of events and advising the OSC and DOSC on public reactions. SITREPS and other factual releases of action may be

cleared by the OSC and DOSC, but releases involving major policy considerations must be forwarded to the JRT for clearance.

504 *Interim public information arrangements*

504.1 In the period following a spill and before the Plan is invoked the information activities shall be directed by the public information personnel of the agency which provides the designated OSC. These activities shall be conducted in accordance with the information policies of that agency.

600 SURVEILLANCE

601 *Operational requirements*

601.1 Within the context of this Plan the operational requirements for surveillance will depend on the circumstances surrounding each pollution incident. Evaluation factors will include the type and quantity of material, location, apparent direction and speed of movement, proximity to critical water use areas and the availability of response resources. The decision to provide surveillance will be qualified by the type, extent and duration of the surveillance coverage needed, which will be re-evaluated as the situation progresses.

601.2 The initial function of surveillance whether or not a pollution incident exists. In some situations this may be self-evident, and certain situations may be deemed to be pollution incident before initial surveillance resources available. The next function of surveillance activity is assessment of the actual threat. These functions provide OSC will information about the degree of further responsibility which is required, including the need for additional surveillance.

601.3 The degree and type of threat during any particular pollution incident will condition the method and type of surveillance which is required and whether it will be continuous or periodical.

700 ADMINISTRATION

701 *Custodians*

701.1 The custodians for this Plan and Annexes and any amendments thereto are: for the United States—the Commandant, United States Coast Guard, and, for Canada—the Administrator, Canadian Marine Transportation Administration, Ministry of Transport.

702 *Amendments*

702.1 Amendments to the Plan and Annexes may be by mutual agreement of the custodians and shall be disseminated pursuant to an agreed procedure.

The CHAIRMAN. You said in your statement that there was no spill contingency plan yet approved. Will this be done before the drilling commences this summer?

Admiral SCARBOROUGH. We anticipate that we will have the criteria on which industry may proceed with proposed plans in the next few weeks, yes, sir.

As I indicated in my testimony, we feel we have an agreement on the essential ingredients of that criteria already.

The CHAIRMAN. I read in the paper today that the Campeche blowout has been contained. Can the Coast Guard corroborate this?

Admiral SCARBOROUGH. Yes, sir, we can. We had a report that the well had been plugged the day before yesterday. We sent out aircraft yesterday to overfly the scene and observe it.

We have reports from several other sources, namely Red Adair. Our aircraft yesterday observed, indeed corroborated the fact that there was no oil emanating from the well, that the fires are out, and that we apparently now are in good condition as far as that particular disaster is concerned.

I talked this morning early with our District Commander down in the gulf area, Admiral Yost, and it's his estimate, based on the forecast of winds and currents, that the spill from the Campeche well should pose no further threat to the shores, coast of Texas.

There will of course always be tar balls in that area, at least for the foreseeable future. Obviously, we should expect those in some sort of increased quantity due to the massive amount of oil that was put in the water by the Campeche well.

The CHAIRMAN. Have you withdrawn your personnel now?

Admiral SCARBOROUGH. From the wellsite; yes, sir.

The CHAIRMAN. How do you determine that 10-percent figure that you described?

Admiral SCARBOROUGH. That was my recollection, Mr. Chairman, of information that was contained in the environmental impact statement on this particular proposal. It's taken from established weather observation data. The environmental impact statement contains considerable climatological and hydrographic information relating to the Georges Bank area.

The CHAIRMAN. You know, this one point gives me a lot of concern. As I indicate in my statement, the estimates are that we are talking about a 6-day supply of oil, enough to supply this country's needs for 6 days.

Yet, it seems to me we are taking a rather high risk of destroying a fishing industry that is a billion dollar fishing industry, if we do in fact have a spill there that occurs in that 10-percent zone that you define.

Admiral SCARBOROUGH. Well, we must remember that the 10 percent time where heavy seas occur are not constant. In other words, it's not for a 36-day, continuous period out of any one area. Winds blow, weather moderates, differing periods of time.

So what we are talking about really is how long one would have to wait before they could start the actual cleanup operations.

Perhaps more important in relation to the concern for damaging the fishery, in this entire oil spill arena, if you will, the one thing that we really have no firm evidence of is just what damage, certainly long-term, and in many cases, even short-term, any particular oil spill in the water does.

That is not to say it does not do damage. Obviously, common sense would indicate that it does. It's just that it's this area of knowledge that in my judgment is greatly lacking, and we just don't know enough. We assume a lot more damage than we actually prove actually occurs.

I think that is a safe approach. We should take that approach. But again, I said what we are talking about here is a risk. And these factors that I just mentioned tend to mitigate the degree of that risk beyond a simple assumption of saying Well, it's a 9 to 1 chance that we are going to have something disastrous happen.

The CHAIRMAN. Wouldn't it be advisable for us to get the answers to some of those questions before the drilling starts?

Admiral SCARBOROUGH. I am not sure that that would be feasible before the drilling starts. This is a very complex thing.

Studies are going on now. NOAA is doing studies in the gulf to determine the damage, if they can, that the Campeche oil did. Every spill, I am sure, has been studied.

This is a basic long-term body of knowledge that needs to be built up. I would not think if you are attempting to make a firm decision within the next few months, I don't think it would be feasible to

have an all-encompassing final definitive study of the damage of oil spills, of oil in the water.

It's been being studied for years. At this point, I think we just don't know.

The CHAIRMAN. Well, let me say that this is one of the areas that gives me a lot of concern. I'm concerned about all the facts that we don't know.

And yet, we are going to go ahead in this area. I want to assure you that if we have a spill up there, and the seas are in excess of 10 feet so you can't do something to clean it up, you can rest assured that you will be back here before this committee.

You understand that.

Admiral SCARBOROUGH. Yes, sir.

The CHAIRMAN. Thank you, Mr. Chairman.

Senator FORD. At the hearing in Boston last month, in going through that hearing, it was my understanding that the Coast Guard testified that equipment does not exist to clean up the Georges Bank area in the event of a spill.

I believe you testified that you have the technical capability, but not the material capability, am I correct?

Admiral SCARBOROUGH. We do have skimmers that are capable of operating in the maximum sea conditions which we have described, 10-foot seas.

We have, I believe, presently about 7 such skimmers. We have plans for procurement of an additional 14 or 15 within the next year and a half.

Senator FORD. Well, do you want to respond to my question that you would be not only technically but materially ready within the exploration period which is to start this summer?

Admiral SCARBOROUGH. We would have the capability that we have now, and that capability is continuing. Where we could clean up any spill of any quantity and any particular time frame, obviously, is a question that I cannot answer with any degree of certainty.

Senator FORD. Can you meet your goal of a 1,000 barrels per day?

Admiral SCARBOROUGH. We can meet that goal presently, provided weather is suitable. I think perhaps, Mr. Chairman, we may be missing one point here in saying what the Coast Guard has or what it does not have.

The responsibility for cleanup, the initial responsibility for cleanup will rest with industry. Industry will have to submit a plan to us before we will recommend approval for the lease.

They have equipment. They have it available, and they can buy more equipment. The Coast Guard's equipment and its approach to providing cleanup equipment, and this is in accordance with guidance that we have had from our committees, is that the Coast Guard should not maintain a large inventory of cleanup equipment.

We should rely on the industry and commercial sources to do that. What the Coast Guard maintains is a sort of backup, first aid, if you will, emergency minimum capability to do something in case, for whatever reason, industry and those who are directly responsible and will eventually have to pay for the cleanup, if we can make them liable, can do.

In this particular case, the leverage that we have, of course, is that before the permit is granted, the capability of industry, through a consortium of pooled resources or by whatever other means, will have to have a plan that meets the approval of the license-granting authority.

Senator FORD. Admiral, you said "If we can make them liable." Did you mean to say that?

Admiral SCARBOROUGH. In this particular case, that probably was not—I may have made an implication that I did not intend.

In this case, I think you can make them liable.

Senator FORD. I thought that was what the law says.

Admiral SCARBOROUGH. I am speaking in general of oil spills, sir, where sometimes we never determine who is liable, or for some other reason, even though we determine the responsible party, their liability is limited for whatever actions of the law make their liability limited.

The Coast Guard, then, has to take over and provide the cleanup by any means, either its own, or pay for it out of the 311 K fund.

And we may or may not be able to get reimbursed.

Senator FORD. Are you convinced that industry has the equipment and capability to do what will be expected of it?

Admiral SCARBOROUGH. I would not believe that they have it on hand at the present time.

Senator FORD. How long will it take them to acquire the equipment?

Admiral SCARBOROUGH. It is available. It could be done within a few months, I believe.

Senator FORD. When you say a few months, what do you mean, 6 months?

Admiral SCARBOROUGH. Time to purchase, in some cases, manufacture. Three or 4 months.

Senator FORD. Three or 4 months?

Admiral SCARBOROUGH. Yes, sir; normal purchasing or contract times for buying equipment.

Senator FORD. In your statement you talked about the Clean Atlantic Associates, and that specific arrangements are being made with Clean Atlantic Associates to respond in any way to an oil accident on the Georges Bank.

That arrangement has not been finalized yet. Therefore, as I understand it, I would like for you to submit for the record to this committee any final arrangement that you make with Clean Atlantic.

Can you do that? Can you provide that?

Admiral SCARBOROUGH. Yes, sir; I might say in furtherance to your previous line of questioning on the equipment, it really is the organization for response that perhaps is equally important, if not more important, than the equipment that is immediately available.

A good organization can arrange to get equipment that it might not own. The Clean Atlantic Associates, it's our understanding, is the organization that's—will act as a consortium representing the various oil companies and will be tasked with providing the organization to do the cleanup and response to this particular lease.

We can provide for the record any subsequent agreement, certainly when the proposed plan is submitted to us for approval, we can inform the committee and will do so, of the action taken.

Senator FORD. I have several other questions I would like to ask you, Admiral. But I understand you have to leave. I will submit those questions to you in writing and hope that you will give me a reasonably quick response.

Admiral SCARBOROUGH. We will, indeed, sir.

Senator FORD. I thank you both, gentlemen.

Admiral SCARBOROUGH. I appreciate your consideration of my schedule.

[The following information was subsequently received for the record:]

QUESTIONS OF THE COMMITTEE AND THE ANSWERS THERETO

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, D.C., March 28, 1980.

Vice Adm. ROBERT SCARBOROUGH,
*Vice Commandant, U.S. Coast Guard,
Washington, D.C.*

DEAR ADMIRAL SCARBOROUGH: Thank you for your excellent testimony at the March 25 hearing on the Georges Bank Protection Act. Your comments will be most helpful as we continue to consider this important legislation.

In following up on comments made at the hearing, I have attached several questions which I would appreciate your answering for the hearing record. In the interest of concluding the hearing record as quickly as possible, please submit your responses to the Committee by April 9. If you have any questions, please contact Sharon Maier of the Committee staff at 224-9321.

Thank you for your assistance.

Sincerely yours,

HOWARD W. CANNON, *Chairman.*

APRIL 25, 1980.

Hon. HOWARD W. CANNON,
*Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.*

DEAR MR. CHAIRMAN: I appreciate the opportunity to testify before your committee in its March 25 hearing on the Georges Bank Protection Act. In your letter of March 23, 1980, you asked that I respond to several questions which would serve to complete the hearing record. Attached are the responses to those questions.

Sincerely,

R. H. SCARBOROUGH,
Vice, Admiral, U.S. Coast Guard, Vice Commandant.

Enclosure.

Question. In the best of all situations, what equipment would you say was mandatory to effectively respond to a major spill on Georges Bank?

Answer. It is our intention to require that adequate amounts of equipment be available to insure a prompt response to any pollution incidents occurring on Georges Bank. To accomplish this we have established general requirements for determining the amounts of equipment that will be required to be maintained by and/or available to the lessee. The procedure will require the lessee to assess the spill threat and equate equipment requirements to the spill threat. A minimum capability which has been considered realistic during discussions between the Coast Guard and Geological Survey (USGS) is sufficient equipment to cope with a spill rate of 1,000 barrels per day. In addition, the equipment must represent the state of the art. Our position is that state of the art equipment would be effective in eight to ten foot seas and in winds in excess of 20 knots. The specific amounts of equipment that should be maintained cannot be determined until a specific piece of equipment is specified and its performance evaluated.

Support vessels capable of transporting, deploying and operating the response equipment must also be available, along with some means to store the recovered oil.

In addition to the oil recovery equipment and support vessels, equipment for applying dispersants and adequate stockpiles of dispersants would be required. This requirement should not be interpreted as a preference on the part of the government for the use of dispersants. Instead, it recognizes that spills may well occur in conditions that preclude mechanical recovery. The amount of dispersant equipment and quantity of stored dispersants required should be related to the spill threat as discussed previously.

Question. Are there oil recovery vessels in current inventories, either Coast Guard or private industry, that would be effective on Georges Bank?

Answer. There is only one Coast Guard cutter class which is marginally suitable as an open water oil recovery support vessel; this is the 180 foot buoy tender renovated with a bow thruster. This vessel has deck space for the transport of large open water skimmers, the heavy lift capability necessary to deploy equipment, and sufficient maneuverability to allow low speed towing of oil recovery devices in five to ten foot seas. There are two such vessels stationed in New England. Other Coast Guard cutters may have some limited towing capability, but the testing necessary to determine the extent of this has not been completed.

We do not have a comprehensive inventory of the number and capabilities of the various types of commercial vessels in the Georges Bank area. However, two statements applicable to the use of commercial vessels for pollution response can be made. First, the offshore supply boats utilized by the offshore drilling industry are generally recognized as the ideal craft for supporting open water operations. Although there are now few of these operating in New England, the exploratory drilling operations on Georges Bank will increase their numbers. Second, previous Coast Guard investigations into establishing stand-by contracts to insure the availability of suitable commercial vessels for pollution response have demonstrated that the operators of these vessels are very reluctant to interrupt existing contracts with regular customers on short notice. Based on these two factors, we believe that the offshore operators on Georges Bank should be required to maintain stand-by oil recovery support vessels and not expect to contract for the needed resources on a case by case basis.

Question. Please cite for the committee the reference on weather conditions for Georges Bank that says seas greater than 8 to 10 feet occur no more than 10 percent of the time.

Answer. The Environmental Impact Statement (EIS) for OCS Sale No. 42 has a chapter within its "Description of the Environment" that cites several studies of the sea states on Georges Bank. They conclude that wave heights greater than 3.5 (11.48 ft.) meters can be expected from 2 percent to 10 percent of the time.

Question. Please provide the Committee with an inventory of spill equipment that Clean Atlantic Association, and others, will have on hand (number of feet of boom, skimmers, etc.) for use on Georges Bank (not counting on rig requirements). How much that will be permanently dedicated to use in the area?

Answer. It is not possible to answer this question until Clean Atlantic's contingency plan is submitted and approved.

Question. Will the spill contingency review plans for Georges Bank be approved before exploratory drilling begins this summer?

Answer. It is anticipated that the Coast Guard's review of the spill response aspects of the industry contingency plans (equipment, training) will occur prior to approval of actual drilling. Of course the review is contingent upon timely receipt of the plans.

Question. What role does the Coast Guard play in setting guidelines for industry contingency plans, equipment, and training?

Answer. Although a Memorandum of Understanding (MOU) among EPA/USGS/USCG is still under development, tentative agreement has been reached within the multi-agency working group concerning contingency planning requirements, response equipment and training exercises. In effect, the Coast Guard will recommend recovery equipment levels, response time and spill exercise standards to USGS and the USGS will ensure that the jointly agreed to standards are met.

Question. How many rig inspections were done in 1979? How many rig inspections are planned for 1980?

Answer. In fiscal year 1979: 1. Conducted 1,937 inspections of 2,400 producing platforms on the OCS.

2. Conducted 56 inspections of 149 U.S. and foreign flag mobile offshore drilling units.

With the 34 inspectors now available, we do project inspecting 560 manned platforms and 150 MODUS in fiscal year 1980. Presently the number of manned

platforms is increasing by approximately 50 per year and the number of MODUS by 20 each year.

Question. How will rising fuel costs effect the Coast Guard's ability to do enforcement and inspection?

Answer. Rising fuel costs have a serious detrimental impact on the Coast Guard's inspection activities. The Coast Guard's primary transportation mode to accomplish inspections and investigations on the OCS is through a leased helicopter program. As operating costs escalate, we must either increase funding for this program to maintain helicopter utilization at a stratic level or else reduce utilizations (and thereby reduce inspections) to maintain existing funding levels. Under the current budget climate, we have no choice but to take the latter option.

Question. How will the current budget cutting effect the Coast Guard's ability to continue enforcement, surveillance, monitoring and response activities on the Outer Continental Shelf?

Answer. The current budget reductions will affect the Coast Guard's activities on the OCS by delaying full implementation of the Outer Continental Shelf Lands Act of 1978. The Coast Guard will, however, continue to inspect all manned structures annually to some degree (i.e. all Mobile Offshore Drilling Units and manned production platforms) and will investigate serious casualties, but will not be unannounced inspections. Surveillance and monitoring activities will be accomplished only to the extent that existing resources permit. We will continue to respond to spill incidents for which authority and funding is provided through the Clean Water Act to the extent existing resources permit.

Senator FORD. Thank you, sir.

The next witness is Ms. Heather Ross, Deputy Assistant Secretary, Office of Assistant Secretary for Policy, Budget and Administration, Department of the Interior.

STATEMENT OF HEATHER L. ROSS, DEPUTY ASSISTANT SECRETARY, OFFICE OF ASSISTANT SECRETARY FOR POLICY, BUDGET AND ADMINISTRATION, DEPARTMENT OF THE INTERIOR; ACCOMPANIED BY BUD (ELMER) DANENBERGER, NORTH ATLANTIC DISTRICT OIL AND GAS SUPERVISOR, USGS

Ms. Ross. Thank you.

Senator FORD. You may submit your statement for the record, highlight if you want to, whatever you deem necessary.

Ms. Ross. Mr. Chairman, thank you very much. I am happy to be here today. I would like to introduce Mr. Bud Danenberger who is with me. He is the North Atlantic District Supervisor for the USGS and is familiar with the activities of the department and other agencies in that area. He will also appear on a later panel you have scheduled.

I would like to take the opportunity you have suggested to put my prepared remarks in the record. Perhaps I could say a few words to open a discussion and then answer questions.

Senator FORD. Your prepared statement will be placed in the record.

Ms. Ross. Thank you, Mr. Chairman.

The few words I have to say would, I think, be most constructive if I focused them on the bill before us today. I would like to make a couple of important points on that proposal, first, with regard to the protection of the Georges Bank and then with regard to the management of the Georges Bank, I will discuss what the Interior Department and other agencies have done to date. Then, I would put my comments in the context of S. 2119.

First, with regard to protection, the OCS Lands Act amendments recognize that the Outer Continental Shelf is an area of uncertain-

ty. That is, it's an area which is broadly different across different regions requiring different tools in different locations. It also recognizes that when we start with oil and gas activity, we don't know everything. That is why the authorities in the act are so thorough, so complete. The Secretary of the Interior is empowered, along with other agencies with their authorities, to do anything that would be necessary to protect the environments in these areas. In fact, the statute requires him to do so.

For example, as to one specific authority we are speaking of today, the question of disposal of materials in the marine environment, the question of drill cuttings and formation water, the controls we have set up are comprehensive. That is, they are designed to respond to any situation that may arise.

It's important to point out the basic authority is EPA's. They have the controls of the Clean Water Act on these disposal considerations. They have been exercising them in the Atlantic very actively. What we have done in Interior is make it clear that we support those authorities by putting them into lease terms and conditions, by explicit reference. Thus, lessees will be aware that, if necessary, disposal will be offsite. We may require barging. We may also require reinjection of formation waters, if that proves necessary.

So the authorities are there to exercise, if the situation we encounter in that area requires it. What we have also done is set up a biological task force, that is, an interagency agreed-upon organization. This is a set of biologists and others with expertise that can advise the USGS supervisor, Mr. Danenberger, as to what kind of surveys need to be done, what research needs to be undertaken. We can then develop an information base that will allow finely tuned decisions on these operations and also we will be able to interpret the rather extensive amount of research that is getting underway now.

I want to comment on that research because I think it's really a very valuable thing that so much interest is being shown and that there is so much activity and discussion. Of course, this means there is controversy. That is how science proceeds. There are different people with different hypotheses. They discuss and argue the merits. Disagreements are narrowed. This procedure is certainly better than establishing set requirements up front, rigidly, without a base of knowledge for being sure that they are the right answers.

We haven't found empirical evidence in the field, nor have we observed significant harm to ocean organisms. We have had acute toxicity testing in laboratories and that is very informative. We are pursuing these studies, along with all the other agencies. But, in the field, we have not had observable evidence that suggests that what the bill proposes is the right thing to do now. We should first know the composition of the formation waters that will be there; we should have a better feel for exactly the composition of muds that the Survey will allow operators to use, that the EPA will allow them to use. EPA will set mud use conditions in their NPDES permits. That is what I would like to say initially on the question of protection.

I would like to make a second point on the question of management, and how the Bank is being managed. Again, this goes back

to the OCS Lands Act. Those amendments were passed when Secretary Andrus was Secretary. He worked closely with the Congress to get them passed. The principle that he pursued was that there needs to be research, there needs to be consultation, and it has to be extensive. But, in the end, it is he who has to make a decision. There has to be a responsible, authorized officer there who can act quickly and authoritatively. He is that person, although he has delegated a great deal of that authority to Mr. Danenberger.

The bill changes that. It carves up the authority the Secretary needs in order to act. Mr. Cannon said that the bill just puts into law something we already have.

I don't think that is quite right. What S. 2119 does, for example, is require the Secretary of the Interior to act in conjunction with the Administrator of NOAA. I am sure if the committee were exercising jurisdiction and a suggestion was made that it had to be joint with another committee—that is an important question about who decides—

Senator FORD. Let me say to you, that is what we are doing today. We are having a joint hearing. So I don't know that that develops any problem here. It may be a little problem for you.

Ms. Ross. I see that you have a point.

Senator FORD. I thank you.

Ms. Ross. We do have a situation that may not be something that you feel the same way about in your setting. If you were to ask for an investigative report, or for the GAO to do a piece of work for you, you would want that report but you wouldn't want the understanding that you would be bound by it unless you made some written showing on your part that you were behaving in a responsible way. So what we are looking at here is a very powerful official, the Secretary of the Interior, and a proposal that takes away his ability to act decisively. The bill would parcel authority out in a way that I think will have very great ramifications for the ability to make authoritative and timely decisions on the Georges Bank.

We would like to keep the arrangement that we put in place that involves expertise and advice, but that does not erode the authority of the official who must act decisively to make operations safe.

Time, authorative action is further affected by the requirement for the Secretary of the Interior to make certain written determinations that operations have certain characteristics of safety for the Georges Bank before he may proceed.

I notice in EPA's report on the bill the point that they fear that written reports will make it difficult for their decisionmaking and will involve more court tests because of the opportunity for those written determinations to be interpreted by courts.

Of course, when there is legislative language as proposed, extensive case law develops about what it means to meet those special legislative requirements. All of that, I think, is in an erosion of our ability to act decisively on the Georges Bank. It does concern us.

There are other points I could make about materials that have been presented. I think perhaps I would stop there and see if Mr. Danenberger and I could answer questions.

Senator FORD. You referred to the Secretary as being a powerful individual and we are eroding some of his authority. You referred

several times to the task force that was there. You mentioned the task force as a source for technical expertise.

Ms. Ross. Yes, that is correct.

Senator FORD. NOAA has responsibility over fisheries, correct?

Ms. Ross. They have responsibility for marine fisheries, yes.

Senator FORD. NOAA has already recommended that drill muds and cuttings be barged, but that was rejected by the Department of the Interior. What is the guarantee that you will take the advice of the task force?

Ms. Ross. Two points. First, we did enter into extensive discussions with NOAA about their recommendations, the recommendations they provided on our proposed notice of sale and our draft environmental statement. What we believed was that as a result of that discussion, that set of discussions, we reached agreement wherein they would not proceed with the marine sanctuary proposal, and we would proceed with the sale notice as we published it. We believed we had an agreement. I believe that we did have an agreement with them.

With regard to the task force, the task force charter, which I could give you for the record if it is not available to the committee, indicates that the chairman of the task force makes recommendations and the supervisor is to act on them very quickly. Mr. Danenberger has indicated he expects, based on the activities of the committee to date, to be in a close working relationship with the task force. If he does not feel he can accept their recommendations, he must respond in writing, and then they may go over his head to the Director of the Survey, and, if they wish, over his head to the Secretary of the Interior. This is an extraordinary arrangement.

A Cabinet officer will have to personally consider these things in a very timely way—

Senator FORD. How can you be timely when you are just outlining a long and complicated route?

Ms. Ross. Well, the response times that have been put in the charter are very quick. At the most, there are 30 days for the process to produce. I would like Mr. Danenberger at this point to comment because I know he's met with the task force and has, I think, a very optimistic feeling about how it is going to work.

But we do expect that, should there be a question, the appeals processes will be given very serious consideration.

Mr. DANENBERGER. As a result of our first task force meeting I am very optimistic about the capabilities of the task force, and I think the recommendations that I receive will be very well justified. As Ms. Ross said, in the event of disagreement, I would have only 5 days to respond, which would then permit them to in turn appeal my decision to the Director and then the Secretary.

At this point the only situations that I can see where there might be some disagreement is where a recommendation is not technically feasible, or if one of the recommendations asks the Survey to do something that is beyond our authority. But since I will be working so closely with the task force and will be in constant communication on these topics, I don't expect this type of problem.

Senator FORD. Always expect the unexpected.

Ms. Ross, in your judgment, would the enactment of S. 2119 cause any delay in the development of oil and gas on the Georges Bank?

Ms. Ross. It has the potential for that, I believe, in the extra administrative steps required to make decisions.

I mentioned the requirement of decisions in conjunction with the Administrator of NOAA. That could require these be brought back to Washington and that we have the kind of discussions that we had with NOAA relating to the sale. Those could be quite extensive.

Then there is the requirement that the Secretary, or Mr. Danenberger who will exercise that authority, make written findings. I think the history of that kind of provision in legislation is one of court review and extensive litigation over the adequacy of the determination. It's a history of what it means to jeopardize a species under the Endangered Species Act, for example. Sometimes those are very important to have in law. That is why we have them in a number of laws.

But in this case I think that the control of day-to-day operations by the supervisor, as advised by the task force, is the way these people can work matters out without legal intervention. The task force, as you know, includes as members, not on a formal voting basis, representatives of the Fisheries Council and of the States.

We have spent 4 years getting to this sale. So I think the prospect for that kind of delay is very serious.

Senator FORD. You spent how long getting to this place, 4 years?

Ms. Ross. We originally scheduled the Georges Bank sale for January 1978. We had been preparing for it for several years before that. At that time there was a question—the plaintiffs indicated that they did not want to proceed before the OCS Lands Act amendments were passed.

In fact, when the court reviewed the proposal they did find a problem on marine sanctuaries. We then supplemented our EIS and went to another stage of court tests, in which we prevailed, and were able to have the sale. But it did take 4 years to get there.

Senator FORD. I believe Senator Cannon said that the estimate of the energy reserves in this area is approximately 6 days.

Ms. Ross. The Georges Bank area appears to be a modest area in terms of resources as we estimate them now. On the other hand, at today's prices, not speculating about future prices, even that amount of oil and gas is worth billions of dollars to the country.

But the important thing I think is that we have only the most basic geophysical information about what is there. And the strategy that we believe should be followed is one of going and testing these areas and finding out whether the United States really has this resource, whether we can count on it.

As you know, there have been finds recently off Canada. There has been one that is very, very promising, a find of oil. We have found gas in the mid-Atlantic.

We also believe that the Georges Bank area is gas prone, which is a clean source of fuel. For example, we think that it's more environmentally sound to develop gas off shore than tankering in oil on the *Argo Merchant*, or perhaps refined product, which is happening all the time.

So we think on balance that if we can find and produce oil, and especially gas, in the Georges Bank that we have a better environmental situation for New England than the one they presently face. And if the resources turn out to be there, and that area is coming up in the estimate of the industry and USGS, we will be very happily surprised at how much resource is there for our use.

Senator FORD. You indicated that you have been working on it several years now. Let's say that if the development is delayed for 1, even 2 years, what negative results would there be, aside from the delay in delivery of any oil and gas that might be found?

Ms. Ross. The principal cost is the cost in not realizing the oil and gas that might be there. I don't think this is the setting to go into a discussion of how critical that is.

Senator FORD. You don't think it's appropriate to get into that discussion?

Ms. Ross. I would be happy to, if it was suitable to the chairman.

What we are trying to do is provide increased domestic supplies from a source which is technologically quite well known and environmentally, has a good record on the Continental Shelf. As you know, people pay us in order to go out there and develop these resources. So we think that this program is a real opportunity for the country to get some of the supplies it needs in an environmentally sound way, and that the benefits to the country are tremendous.

When you count both the real income losses we are suffering and the national security issues associated with imports, we see this to be a very valuable program for the country; a safe domestic supply, to back out imports. So I do think that it is very important to proceed and that there is a big loss from not proceeding.

One can do discounted present value calculations. We do these as a matter of course for each sale, because that's how we establish prices for the leases. So one can calculate what it means to wait 1 year or 2 or 3 years. The costs of putting off the realization of oil and gas potential are very substantial even in an area like Georges Bank where the resource is not what we think it might be in a place such as the Beaufort Sea.

Senator FORD. Am I correct in this statement, that somewhere between 14 and 17 percent of the U.S. food fish come from this area?

Ms. Ross. I wouldn't want to confirm that figure for you. I believe that a substantial amount of fish protein comes from that area. I don't know the exact figure. In the Outer Continental Shelf we have a number of areas like that. We have the Kodiak area off Alaska. We have an area in the Bering Sea, the Bristol Bay. We have other important fisheries. There are important fisheries in the Gulf of Mexico.

And so the question of protecting the fish is a very important one for the program. That is especially true of the Georges Bank.

Senator FORD. Is it your intention to complete any or all of the studies in the long-range effects of drilling muds and formation waters prior to the commencement of drilling?

Ms. Ross. What I would expect to do in that regard is rely very heavily on the biological task force. That is, if it is essential that work be done before activities can proceed, then that is the answer.

I don't believe that we are expecting that that is the case. For example, the OCS Lands Act requires the supervisor to make a decision about an exploration plan within 30 days of its submission. We hope to be able to meet that standard.

But if, in fact, the expert advice is that we are not able to proceed, and that is advice we accept at the Department of the Interior given our other mandates, then we would have to proceed more slowly than we now anticipate.

Senator FORD. We are concerned with, also, lease sale No. 52, which is proposed now in your schedule for 1982; is that correct?

Ms. ROSS. I believe that's correct.

Senator FORD. Does that cover the exact same area as did No. 42?

Ms. ROSS. We have called for nominations in that area on a very broad basis. When we ask people where they are interested in leasing, and when we ask the general public what areas they are concerned about, we do that very broadly. We then have to select tracts for environmental analysis.

So far the levels of interest that have been shown tend to show the oil and gas potential as being in the vicinity of the sale that we recently had, sale 42. I would ask Mr. Danenberger if he could elaborate on that. That is as much as I could tell you.

Mr. DANENBERGER. That is pretty accurate.

Senator FORD. The call for nominations is in the same area, though, isn't it?

Mr. DANENBERGER. Yes, the call is in the same area, but it's a much broader area.

Senator FORD. Then let me ask you this. Didn't you delete some of the area, or some tracts from 42 as too sensitive?

Ms. ROSS. Yes. There were several deletions, not counting the deletions to accommodate Canada on a boundary issue. The ones for environmental protection, I believe, were 23 tracts that were removed by the Secretary for fishing conflicts, and there were a set of tracts around Lidonia Canyon that were withdrawn in order to protect the bottom, the shellfish, and the coral in that area.

So where there were specific biological population concentrations identified, the Secretary, in considering the sale configuration, did delete tracts. Those were tracts recommended for deletion by the State of Massachusetts.

Senator FORD. Are they also included in 52?

Ms. ROSS. They were included in the call area. What we do is ask for commentary on the entire protraction diagram area so that what we ask for is broadly based information.

We feel we need the information to make the decision whether to proceed with an analysis for deletion. So information calls are very broad. We do want to have information from all parties on which we can make a decision to delete or to retain.

Senator FORD. Do you have that kind of information available now?

Ms. ROSS. I was trying to find my schedule so that I could tell you exactly where we are in the preparations for that sale. I usually have this attached to my right hand, as you know, Senator. We have been working with the schedule for so long.

Senator FORD. Does this study just have to do with the potential of oil and gas, or does it have to do with the fish?

Ms. Ross. The process following the call for nominations is that the Department considers all the information that is developed, including extensive commentary by people who are concerned about oil and gas leases. It then makes a decision on tracts that will be studied in an environmental statement.

The study in the environmental statement does consider resource values and scenarios for development. It does look at the fish and other uses of the area and asks what are the environmental impacts of proceeding with a sale under certain terms and conditions on the tracts that we have identified.

Senator FORD. Basically, you are going to do the same thing twice, aren't you, and you have already made an administrative decision?

Ms. Ross. I think that each of these considerations is new. That is, we have information from the previous sale, both on resources and on the type of operating conditions. We have scheduled, in the 5-year program, second sales in frontier areas with a 3-year lag from first sales, precisely so that we will know more. I believe we will know a lot more.

We will have, for example, the deliberations of the biological task force for that period of time which I expect—

Senator FORD. What would cause you to halt the sale of 52?

Ms. Ross. I think evidence that the balance that you were speaking of would be unfavorable—that when we look at the resource potential and we look at the environmental risks, and we look at the possible disruption to other users and uses of the area, that we could tell early on that that balance was unfavorable.

Senator FORD. But you have already advertised and scheduled 52?

Ms. Ross. The planning schedule, as you know, is required under the amendments. There is not a sale scheduled. There is no commitment to hold a sale. It is a planning document that we use and the industry and States in particular find very helpful. It allows them to make preparations because they know what the sequence of activities is going to be. It is not a commitment to have a sale and we have not scheduled 52.

Senator FORD. But you have indicated that you hope to sell in 1982.

Ms. Ross. We are talking about the kind of decision the Secretary will make on a 5-year program. The June proposal indicated that sale 52 was something that we propose to start planning for, that's correct. Now, I believe that the way to characterize that is to say that when the Secretary considered it at that time, he believed the balance was favorable. He believed that it was suitable to go ahead and plan and see whether we could proceed. He didn't have enough information to say it was unsafe now.

Now he will make a further decision. As you know, we have written an environmental impact statement on that June proposal. He has before him and is about to announce his further decision based on the environmental analysis in that statement. I don't know what the answer will be as far as what he is going to come out with. But he is considering the very issue about whether 52 should appear at that time.

Senator FORD. In your testimony you mention the decisions on disposal methods are best made on a case-by-case basis; is that correct?

Ms. ROSS. I think that's correct.

Senator FORD. What criteria do you use to determine that an alternative method is needed?

Ms. ROSS. That is something the supervisor and task force are working very actively on. I would like to ask Mr. Danenberger to respond in a little more detail about how that is going to be handled.

Mr. DANENBERGER. As an example, if there were a bottom area that had very rich marine life and the biological task force determined that there was inadequate dispersion if mud were discharged at that point, then we could require the operator to not discharge mud at that site to prevent the possibility of that rich bottom area being impacted. It is a decision based on the natural dispersion and oceanographic conditions in the area plus the marine conditions in the area.

Senator FORD. Is this based on some sort of regular monitoring system for the levels in the water, or whatever? Is it a consistent monitoring system?

Mr. DANENBERGER. There is a good bit of data regarding the bottom conditions and the marine life. The biological task force is presently in the process of determining whether certain site specific studies might also be necessary prior to approval of any plans of exploration.

Senator FORD. Who carries out the monitoring system? Is that your agency?

Mr. DANENBERGER. It can be a requirement for the operator to conduct the monitoring, or it can be a Government project conducted by the Department of the Interior, or it can be a joint project which includes the Environmental Protection Agency and NOAA, as well.

Senator FORD. Is it really nailed down as to who is going to do it?

Mr. DANENBERGER. Not at this point because right now the task force is studying what they believe should be done. Then the recommendation will come forth as to the best way to accomplish it.

Senator FORD. I have one final question for you, Ms. Ross. And I think, in fact I will try to put it in the best perspective. Isn't the basic issue here whether Congress should let the executive branch make the decision about how much risk to run with respect to fishery resources of Georges Bank?

S. 2119 mandates actions designed to protect fish regardless of impact on oil development. How else can Congress be sure that section F, I believe it is, of Interior, favor fish over oil?

Ms. ROSS. I think that we operate very publicly, sir, in the way we make decisions now on the Outer Continental Shelf. It is not an act of backroom executive branch discretion. We have the task force. The meetings are open to the public. The information will be developed.

Senator FORD. I didn't expect you to get in the backroom and start smoking a cigar, you know. That doesn't become you. But I am saying that the question is whether Congress should let the

executive branch make the decision, or should we mandate actions designed to protect fish over oil.

Ms. Ross. Let me respond more directly to your question.

Senator FORD. I thought you were being direct; I am sorry.

Ms. Ross. We think the Congress did give us very explicit direction in the OCS Lands Act about how we were to see to the balancing of interests. I think we have a very good record on that. I don't believe that we need further directives for specific regions to achieve what the Congress intended. I think the Secretary of the Interior has good environmental credentials and I think he's done an excellent job at using the authority available to him. I think there is general agreement on that. I believe that will continue, and that the arrangement that we have put in place in the Georges Bank is testimony to that. We have the authority to act.

We have informed the lessees that we will act. We have established a set of interagency experts and have involved the public to help us carry out our authorities. I don't believe that we need further congressional directives on how to behave in this case.

I think that any problems and their solutions will be best judged by those people exercising their expertise and management authority, rather than by Congress, up front, making a judgment that it doesn't have the information to make right now.

Senator FORD. Are you familiar with the court decision in the First District Court of Massachusetts, I believe it's the First District Court in Massachusetts?

Ms. Ross. To some degree.

Senator FORD. What did the court tell you at that time as it related to fish and the view of the Department?

Ms. Ross. The court directive that I am most familiar with is the one we had to act on before we were able to go back to the court and get a clearance to go ahead with the sale.

That directive dealt with marine sanctuaries, whether or not a marine sanctuary was an alternative management method that would protect the fisheries.

Senator FORD. Didn't the court basically say to you that you were taking a too restrictive view as it related to fisheries?

Ms. Ross. The district court made several comments on what we had done with respect to fisheries. Some of those were upheld by the circuit court, but not all of them.

The one the circuit court did advise us very strongly about was a marine sanctuary. The court said we should consider that very carefully as an alternative management tool to protect the fishery.

We did that. We wrote a supplemental EIS, had discussions with NOAA, and had hearings on the EIS. We went through the process, as directed by the court, and pursued that possibility very seriously.

Ultimately, after negotiations with NOAA and clearance by the court, we were able to proceed with a redesigned sale.

Senator FORD. I will go back to one question, which is the final one.

Mr. Andrus is not immortal. He's not going to be there forever. What if you get someone in who has a very strong feeling as it relates to drilling and moves harder in that direction, and takes it out of the perspective where maybe Secretary Andrus has it?

Where does that leave you then, without any mandate from Congress, as it relates to Congress?

Ms. Ross. That is an interesting question.

Senator FORD. I know it's an interesting question.

Ms. Ross. That is a question that many people have raised in other forums. I say two things about that.

The first is that we have congressional guidance in the OCS Lands Act. We have very extensive congressional guidance about the use of best available technologies, about the balancing that must go on in reaching a sale decision.

I know you are familiar with that statute. The committee worked very hard on it. We have made it the basis for our operations. It brings them up to date. We feel that it is strong guidance.

With respect to the Secretary, I have thought about that. My feeling is that—

Senator FORD. Oh, you have thought about that question? Good.

Ms. Ross. Yes; I work for him, and I have wondered what would happen.

Senator FORD. To both of you.

Ms. Ross. Well, as it turns out, I am not a political appointee, sir, but you have a good point.

Senator FORD. They are all political, honey, regardless. Even when you go to a Baptist Church, it's political.

There is a Baptist over there in the corner.

Ms. Ross. I don't believe that Secretary Andrus is a historical accident. I think there is a reason he is here in the Department of the Interior. I think that is the trend of Government in the energy and environmental areas.

I think the public interest, the public expression of interest, has come to a point of environmental sensitivity that has produced the OCS Lands Act Amendments and produced the officials who are implementing it.

I don't expect to see that turned back.

Senator FORD. I didn't know Cece was so great. He was Governor at the same time I was, and I thought we put our pants on the same way, one leg at a time.

Ms. Ross. I could say fine things about you, too, Senator.

Senator FORD. I was trying to help you get in that direction a little bit, honey.

You're mighty kind, and I enjoy having you as a witness, as I did the other day. I look forward to working with you.

Ms. Ross. Thank you. May I say something further? I don't mean to disrupt the proceedings, but I know Mr.—

Senator FORD. Senator Tsongas is here. He may want to ask you a few questions.

Ms. Ross. I am sorry.

Senator TSONGAS. Let me say I appreciate the invitation to be here. These are lovely chambers you have, compared to where I hang my hat on Energy and Banking.

Senator FORD. I am just so delighted you could be here and enjoy this.

Senator TSONGAS. For 1 day.

Mr. Chairman, I don't want to inquire of the witness. Just make two points.

One, I would like to put in the record, if I may, an advertisement in the newspapers in Boston that Mobil paid for that goes into a tale of two cities, Boston-New Orleans.

The reason that Boston is the most expensive city in the continental United States is because of energy, and then tries to make the argument that if we had drilling in Georges Bank, that the cost in Massachusetts would go down.

It says if we do discover something in Georges Bank, "something" is a technical term obviously, the real winner will be New England economy in its energy uses.

Obviously, the attempt is to link our economy with Georges Bank, which is typical of Mobil's kind of advertising.

I would like to have that inserted in the record as a kind of atmosphere under which this thing is being discussed.

[The following information was subsequently received for the record:]

Observations



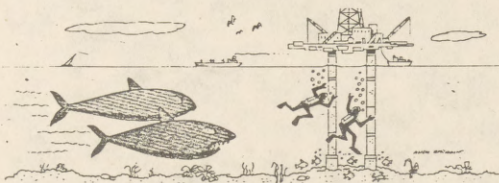
Tale of two cities. Boston and New Orleans—both rich and exciting towns—are as different as



codfish and crawfish. Boston is the most expensive city in the continental U.S. for middle-income living, according to the Bureau of Labor Statistics; New Orleans is cheaper than average. Why the difference? One big reason: energy. And that matters to the whole country.

Hard times. New England relies heavily on high-cost oil (and has none of its own) for heating and for generating power, while the U.S. as a whole uses more coal and natural gas. That's a key factor in New England's high cost of living, and it helps explain why Boston's electric bills surged upward at more than twice the national rate last year. Yet energy exploration in the Georges Bank, off Massachusetts' coast, was delayed for a full year—putting off New England's chance at what federal experts guess might total 123 million barrels of oil and 870 billion cubic feet of natural gas. The major environmental fear: oil development might hurt fishing.

A novel twist. Fishing is important to Louisiana, too, but what's happened to the Gulf of Mexico after decades of oil-gas development? Better fishing, say state officials—consistently larger catches over the past 30 years. Seems the offshore rigs act like reefs, where fish like to hang out. Matter of fact, it's healthy onshore, too, thanks largely to a booming energy economy and plenty of energy investment. School children and college students benefit from state oil revenues that contribute hugely to education. New Orleans even held an "Appreciation Day" for petroleum and related industries—while in Massachusetts some government officials squabbled over whether offshore leases should be granted at all.



"Forget it, Mack—those oil exploration people got enough trouble without us."

No Scrooges. When Georges Bank drilling rights finally were sold, Mobil was called the "big winner." But what we and others really won was the right to give \$492 million to the U.S. for the right to risk millions more in exploratory drilling. We're hopeful, but farther down the Eastern Seaboard the Baltimore Canyon has claimed over \$1.5 billion from the oil industry, and yielded only gas in so-far non-commercial quantities. Just one area off Florida has cost Mobil and its partners \$650 million without success.

Great expectations. If we do discover something in the Georges Bank, the real winner will be New England's economy and its energy users. A find would benefit the whole nation because every domestic discovery helps whittle down America's dangerous overdependence on foreign supplies. And finding energy doesn't have to mean risking the sea, or the rest of the environment. So why, we wonder, aren't the federal and state governments doing everything possible to encourage U.S. energy development? You might ask that question of candidates for public office... and don't settle for a fishy answer.



It's a fact: Mobil invested almost \$2 billion in finding, acquiring, and developing U.S. energy resources last year.

Mobil

Senator TSONGAS. Secondly, the question is not who President Carter might appoint after Secretary Andrus, the question, speaking of historical accidents, is whether somebody like Ronald Reagan might become President of the United States.

In that situation, if Ronald Reagan says there is as much oil in Alaska as there is in Saudi Arabia, he's only off by a factor of 13. Which for him I guess, is not too bad, as those things go.

Put something like that in the White House, then you can imagine who you are going to be working for. And what happens to my State? Georges Bank is only one small component of a whole State's approach to its viability.

It seems to me that one thing you try not to do around here is to fight the last war. I think all the trends are going the other direction.

With all due respect, and my admiration for the Secretary has been often stated, I do think that we have to put in place those protections that will be there irrespective of who might be in the White House, because it's too late once the damage has been done to say "Well, maybe we should get together and try to set up some guidelines," because you know, we are not Texas, we are not Oklahoma, we are not Louisiana.

Georges Bank is something like 20 days' supply of oil.

Senator FORD. Six.

Senator TSONGAS. Although that is important, that is not the basis of our survival. I think the lifestyle that we have is. And to the extent that this Congress can seek to maximize its viability in the fishing industry, we have that responsibility.

If it is always going to be Cecil Andrus and a sensitive administration, then it would be a different atmosphere. But we are now in the process of more energy at any price.

Clinch River breeder reactor, which you people are opposed to, the administration, funded by the Congress, the energy at any price syndrome, I think, is dangerous. I just don't want it to have an impact on my State.

Did you want to add something to the chairman's discussion about pants?

Ms. Ross. I thank you for your remarks. I hope we don't have to legislate on the basis of the assumed malfeasance of people. I don't think the Congress generally does that.

I don't believe the standards that are to be set in this bill are the right standards for the right people. I am optimistic that what has been put in place and is in place—it's not discretionary, it is in place—will in fact give Mr. Andrus and those in the region do the day-to-day work with their counterparts in the other Federal agencies, the facts they need. I believe that there is a continuity there, and that there is a sensitivity.

I hope we can make that work, because we have had a lot of upset and controversy over the Georges Bank.

When we can get to the point of operations, can get the parties together and working in the way this task force is set up to work, with extensive public participation, I believe we will be able to work things out and not have what I think would be very excessive continued controversy and litigation that would come with this legislation.

So my message here is basically "Give peace a chance." I think we can make it work up there.

Senator TSONGAS. Is to give what a chance?

Ms. Ross. Peace.

Senator TSONGAS. You do all right.

I will give you a copy of the Mobil ad. These are the people who are going to be doing the work. That is the mind set from which they come.

All the good intentions in DOI notwithstanding, those are the people who will be in the operational phase. You have to be concerned about that kind of advertising. It's so simplistic. You wonder whether you can have any kind of rational thinking imposed on that corporate mind set. I don't think you can.

Ms. Ross. As you know, industry is not necessarily enamored of all our regulatory controls. In fact, we are exercising independent oversight of them that is not necessarily their preference as to how we behave.

I have worked with Mr. Danenberger; I am optimistic that we can make it work.

Senator TSONGAS. I saw a poll in the Post yesterday, 45 to 44 in the Presidential race. It makes me all the more determined that these things should pass while peace does have a chance.

Senator FORD. I appreciate this political discussion.

I have no further questions.

Paul, do you have any further questions? We thank you for your—

Ms. Ross. Could I make one observation, since I seldom get a chance to speak in these settings after Mr. Studds, and I won't today.

He does make some remarks about what the record shows, that I would like to be able to clarify for the Committee.

Senator FORD. I will be glad to take a statement and put it in the record for you.

Ms. Ross. Very good.

[The statement follows:]

STATEMENT OF HEATHER L. ROSS, DEPUTY ASSISTANT SECRETARY, DEPARTMENT OF THE INTERIOR

Mr. Chairman, Members of the Committee, I am pleased to be here today to discuss the management of oil and gas operations on the Georges Bank.

The Department of the Interior appreciates the concerns of those who support legislation, such as S. 2119, to establish special protective measures for particular areas of the Outer Continental Shelf. They reflect our own concerns for assuring adequate protection of the environment during the exploration, development and production of offshore oil and gas resources, and our own efforts to tailor controls on offshore operations to the specific features of individual marine areas.

Our major management controls are principally incorporated in OCS regulations which are nationwide in scope and application. These regulations are supplemented by OCS operating orders which apply to regional areas. In the last three years, we have also made extensive use of carefully tailored lease terms and conditions which are specific to individual leases and sales. The result is a comprehensive system of controls and specific procedures to assure that oil and gas activities on the Outer Continental Shelf are conducted safely in each unique area.

With regard to regulations, the Department has recently completed a review and re-promulgation of all major regulations on OCS activities. I have attached a status report on each of the regulations to be published or republished under the OCS Lands Act Amendments of 1978, including those referenced in S. 2119. Most regulations required by the Amendments have been published in final form. The few

exceptions include the antidiscrimination requirements of Section 604, and those in the process of further identification such as hazardous working areas. Work is progressing on all items not yet completed. We have also implemented the provisions of the 1978 Amendments to the OCS Lands Act that provide for more extensive and more comprehensive involvement of coastal jurisdictions and other interested parties in the processes leading to leasing and to the approval of operations proposed by lessees. Using the full set of authorities the Congress wrote into the OCS statute, and mindful of the authorities of other agencies such as EPA, the Department has taken actions which we believe will be adequate to protect the resources of the Georges Bank.

Leases issued on the Georges Bank contain the contractual provision that reinjection of formation waters and barging of drilling fluids can be required by the Department. The Environmental Protection Agency authorities, under the Clean Water Act, to require permits for any discharges into the ocean are also applicable. While transport and reinjection have generally not been required on the OCS, decisions on disposal methods are best made on a case-by-case basis, based on the environmental conditions found at each site. This will be done in the Georges Bank.

The Biological Task Force established for the Georges Bank will furnish an important mechanism for helping to make these case-by-case determinations. This Task Force concept, which has been used in the mid-Atlantic, will assure us that the extensive expertise, coordination and cooperation which exists within and among Federal agencies, State governments and interested groups will be brought to bear in an effective and timely manner to protect the important fishery and other biological resources of the Georges Bank.

The Georges Bank Biological Task Force has a formal membership consisting of the National Oceanographic and Atmospheric Administration, the Environmental Protection Agency, the U.S. Geological Survey, the Bureau of Land Management, and Fish and Wildlife Service. In addition, the charter of the Task Force provides for participation by affected States, in this case all coastal States from Maine to New Jersey. The New England Fishery Management Council has been invited to participate on the same basis as affected States. Additionally, to assure that all parties with interests are allowed to participate, the meetings of the Task Force are open to the public. At the first meeting of the Task Force, on February 12, a wide range of groups and interests outside of the formal membership was represented. Such participation is expected to continue.

Mr. Chairman, we have worked hard to make oil and gas operations safe on the OCS in general, and to protect the valuable marine environment and resources of the Georges Bank in particular. We believe that those efforts, together with the expertise, authorities and cooperation of other agencies, have established a management regime for the Bank which will allow us to respond quickly, knowledgeably and effectively to any circumstance which may arise there. Survey and monitoring activities, backed by ongoing environmental studies in the laboratory and the field, will provide a continual flow of information as operations are initiated and proceed. Expert interpretation of that information, and advice based upon it, will be provided directly to the Federal official with comprehensive management authority over oil and gas activities on the Bank—the USGS Supervisor. He will have the range and flexibility of authority to take whatever steps may be necessary to control operations and protect the Banks.

The environmental record of the OCS program is a good one. Secretary Andrus in particular has made environmental protection a watchword of the program—working energetically to achieve passage of the OCS Amendments and then to implement their provisions fully. Our experience in frontier areas has been that initial concerns at the lease sale stage have been followed by cooperation with affected interests to arrive at operations which all parties agree meet a stringent standard of environmental protection. We believe we can achieve that result in the Georges Bank, and we want the opportunity to do so. Consequently we oppose enactment of S. 2119, which imposes a more rigid, cumbersome and fragmented approach to management of the Bank than the one already established pursuant to existing law and based on the experience, judgment, and agreement of the Federal agencies involved.

I will be happy to answer any questions you may have.

IMPLEMENTATION OF OCS LANDS ACT AMENDMENTS OF 1978, STATUS OF REGULATIONS AND RELATED PROCEDURES

Regulation content	Citation	Publication date (Federal Register)
Title II:		
U.S. Geological Survey regulation of OCS operations after a lease has been issued.	30 CFR 250.....	
Requirements for submission and approval of exploration, development and production plans.	30 CFR 250.34.....	Sept. 14, 1979.
Air quality controls.....	30 CFR 250.57.....	Mar. 7, 1980.
*All other provisions (e.g., access to platforms, drilling and abandonment of wells, records required, royalty procedures, remedies and penalties, best available and safest technologies (BAST) requirements).	30 CFR 250.1 to 250.96.	Oct. 26, 1979.
*U.S. Geological Survey regulation of prelease geological and geophysical exploration. This rule includes authority to issue prelease exploration permits for areas where hydrocarbons may be present. (Also includes BAST requirements.)	30 CFR 251.....	Jan. 25, 1980.
U.S. Geological Survey regulations on OCS Oil and Gas Information Program. This rule implements the statutory requirements to transmit to affected States information on OCS oil and gas activities.	30 CFR 252.....	Aug. 7, 1979.
Bureau of Land Management regulation on minerals leasing and rights-of-way. This rule implements the statutory requirements for the issuance, assignment, and transfer of leases, formulating a leasing program, granting rights-of-ways for pipelines and other matters.	43 CFR 3300.....	June 9, 1979.
Department of Energy regulation on three bidding systems: Fixed bonus with variable royalty, variable bonus with fixed royalty and with sliding scale royalty.	10 CFR 375, 6.....	Jan. 12, 1980.
Additional regulations are under consideration by the Department of Energy..		
*Department of Transportation-U.S. Coast Guard regulations on hazardous working areas are being prepared. Inquiries to the public have been answered and are being evaluated. Final rules, if required, are scheduled for publication in June 1980 (section 21 requirement).		
U.S. Coast Guard regulations, implementing section 30, on documentation, registry, and manning requirements on the OCS.	33 CFR Subchapter N.....	June 19, 1980 (Proposed rule).
Title III (oilspill pollution fund):		
Federal Maritime Commission regulation establishing financial responsibility for ships carrying OCS produced oil.	44 CFR 544.....	Mar. 20, 1979.
U.S. Coast Guard regulation implementing the oilspill fund authority.....	33 CFR 135, 136.....	Mar. 19, 1979.
Procedures for collections for the fund have been established and implemented by the Internal Revenue Service. Appropriation legislation has been enacted.		
*Title IV (fishermen's contingency fund):		
National Marine Fisheries Service regulation implementing the fund authority.	50 CFR 296.....	Jan. 24, 1980.
U.S. Geological Survey regulation on marking equipment used on the OCS.....	30 CFR 250.54.....	Oct. 26, 1979.
Procedures for collecting assessments have been instituted by USGS. Cooperative agreements between USGS, U.S. Coast Guard, and the National Oceanographic Service on dealing with obstructions on the OCS have been implemented and cooperation continues.		
Title VI:		
U.S. Department of the Interior regulations on unlawful employment practices and absence of exclusion from activities conducted pursuant to the provisions of the OCS Lands Act amendments.	43 CFR 35.....	April 1980 (Proposed rules).

Note.—Those items marked with an asterisk (*) are addressed in S. 2119.

Senator FORD. Thank you. The next witness is the Honorable Gerry Studts.

[The following information was subsequently received for the record:]

U.S. DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D.C., April 17, 1980.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: Enclosed is additional information promised at the hearing before the Committee on Commerce, Science, and Transportation and the Committee on Energy and Natural Resources on March 25, 1980, on S. 2119, concerning Georges Bank fisheries protection.

The enclosed information has been prepared by the Office of the Assistant Secretary for Policy, Budget and Administration.

Thank you for the opportunity to provide this additional data to the Committee.

Sincerely,

JOHN M. POWELL, *Legislative Counsel.*

Enclosure.

U.S. DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D.C., April 9, 1980.

Hon. GERRY STUDDS,
House of Representatives,
Washington, D.C.

DEAR MR. STUDDS: On December 31, 1979, in response to your questions at the December 4, 1979, oversight hearings held by the House Select Committee on the Outer Continental Shelf, I forwarded you material on drilling fluids prepared by the U.S. Geological Survey (USGS). An attachment to my letter entitled "Toxicity: Drilling Fluids and Cuttings" contained the statement, "The Geological Survey presently has a shelf full of studies and reports on this topic." At a subsequent oversight hearing, on February 6, 1980, you requested that those studies be made available. Enclosed is a bibliography of materials, fifty titles in all, which is pertinent to your request. USGS has this material in its possession.

To further respond to your interest in this area, I am also enclosing a list of titles prepared by the Fish and Wildlife Service (FWS) in conjunction with work on discharges in Cook Inlet. More than 125 items are listed by the FWS, some of which are quite general in nature, others very specific, but all of some relevance to OCS drilling fluids questions.

Because it is very recent material, and touches on subjects you have mentioned at the hearings such as bioaccumulation and sub-lethal effects, I am also enclosing material prepared by Professor Jerry Neff of Texas A & M University. His review of toxicity and biological effects of used drilling fluids was presented for the record at the hearing on March 25, 1980, on S. 2119, held jointly by the Subcommittee on Energy Resources and Materials Production of the Senate Energy and Natural Resources Committee and the Senate Committee on Commerce, Science, and Transportation. In his discussion, Professor Neff draws on recent (1980) work in this field and includes a bibliography of references.

Finally, as to work done on drilling fluids fates and effects, I am sure you will be interested in the symposium held at Lake Buena Vista, Florida, January 21-24, 1980. The symposium was co-sponsored by a number of United States and Canadian Government units and industry. The Department of the Interior, specifically the Bureau of Land Management and the Geological Survey, the Department of Energy, the Environmental Protection Agency and the National Oceanic and Atmospheric Administration were U.S. Government sponsors. Canadian government sponsors included the Department of Indian and Northern Affairs and the Environmental Protection Service, Environment Canada. Industry sponsors included the American Petroleum Association. Approximately 50 papers were presented at the symposium dealing with research on the environmental fates and effects of drilling fluids and cuttings. The presentations dealt with drilling fluid components, dispersion of fluids, assessment methodologies, toxic effects and other related matters. A volume of proceedings of the symposium is being prepared for publication in late summer or

early fall. Copies will be available from the symposium contractor, Courtesy Associates, 1629 K Street, N.W., Suite 700, Washington, D.C. 20006.

In my letter of December 31, 1979, in responding to a question you asked on the proprietary nature of information on drilling mud composition, I stated that such information is not proprietary. I was misinformed at the time and my answer was not entirely accurate. I say not entirely because the proprietary nature of constituents of drilling muds apparently goes only to the relative percentages of each constituent in a product with a number of components. While this appears to differ from the statement you quoted at the February 6, 1980, hearings from a 1978 American Petroleum Institute Bulletin on drilling fluids chemicals, it is the latest position of the Petroleum Equipment Suppliers Association as presented in testimony on S. 2119 on March 25. Of course, regardless of the proprietary status of any information about drilling muds, that information is available to regulatory agencies such as the Geological Survey and the Environmental Protection Agency. As has been mentioned a number of times, and recently by the Secretary before the House Select Committee, the Geological Survey does require information on the components and the amounts of materials in muds proposed for use, and can require such information to be provided in great detail. EPA can also require such information in applications for discharge permits under its NPDES program. The Georges Bank Biological Task Force would also have access to this information so that its work can proceed on a fully informed basis.

I apologize for the delay in providing you these materials. In view of the exchange engendered by my earlier letter, I wanted to be sure that this response was a satisfactory one. I hope that this information is of use to you. Please let me know if there is any further information or clarification which would be of help.

Sincerely,

HEATHER L. ROSS,
*Deputy Assistant Secretary—Policy,
Budget and Administration.*

Enclosures.

STUDIES INVOLVING THE FATES AND EFFECTS OF DRILLING FLUIDS

1. Angelovic, J.W. 1975. Environmental Assessment of An Active Oil Field in the Northwestern Gulf of Mexico, 1975-1980, Project Development Plan, November 1975. Gulf Coastal Fisheries Center, NMFS/NOAA, 32 p.
2. Abbott, R.E. and T.J. Bright. 1975. Benthic Communities Associated with Natural Gas Seeps on Carbonate Banks in the Northwestern Gulf of Mexico. Report for: Study of Naturally Occurring Hydrocarbons in the Gulf of Mexico, Oceanography Department, Texas A&M University, 191 p.
3. Abbott, R.E., A.J.J. Leuteran and T.J. Bright. 1975. Preliminary Report on Biota of Drowned Reefs Associated with Natural Gas Seeps in the Northwest Gulf of Mexico. Report for Study of Naturally Occurring Hydrocarbons in the Gulf of Mexico, Oceanography Department, Texas A&M University, 27 p.
4. Bright, T.J. and et al. 1974. Baseline Survey, Stetson Bank, Gulf of Mexico. An investigation conducted by Texas A&M University for Signal Oil and Gas Company, 59 p.
5. Bright, T.J., R. Rezak, et al. 1976. A Biological and Geological Reconnaissance of Selected Topographical Features on the Texas Continental Shelf. Texas A&M Research Foundation Contract No. 08550-CT5-4, Final Report to USDI, Bureau of Land Management, 377 p.
6. Bright, T.J., R. Rezak and et al. 1978. South Texas Topographic Features Study. Texas A&M Research Foundation Contract No. AA550-CT6-18, with USDI, Bureau of Land Management, 597 p.
7. Bryant, W. and et al. 1974. Baseline Survey, Stetson Bank, Gulf of Mexico Geology. An investigation conducted by Texas A&M University for Signal Oil and Gas Company, 38 p.
8. Continental Shelf Associates, Inc. and Steimle, Smalley & Associates, Inc. 1975. East Flower Garden Bank Environmental Survey, Lease OCS-G 2579, (Monitoring Programs for Wells Nos. 1 and 2, 3/7-5/4/75, High Island Area Block A-389) Conducted for Mobil Oil Corporation, 6 v., 871 p.
9. Continental Shelf Associates, Inc. 1976. Pre-Drilling Survey Report, Well No. 1, February 18-19, 1976, High Island Area South Addition Block A-502, OCS-G 2374, Burmah Oil and Gas Company, 16 p.
10. Continental Shelf Associates, Inc. 1976. Post-Drilling Survey Report, Well No. 1, March 4-6, 1976, High Island Area South Addition Block 502, OCS-G 2374, Burmah Oil and Gas Company, 9 p.

11. Continental Shelf Associates, Inc. 1976. Pre-Drilling Survey Report for Continental Oil Company. Well No. 1, Block A-85, Mustang Island Area East Addition, OCS-G 3061, 27 p.
12. Continental Shelf Associates, Inc. 1976. Post-Drilling Survey Report for Continental Oil Company, 7/26/76-7/30/76, Well No. 1, Block A-85, Mustang Island Area East Addition, OCS-G 3061, 11 p.
13. Continental Shelf Associates, Inc. 1977. Sediment Barium and Ocean Current Survey Report for Continental Oil Company. October 22, 1976 to January 13, 1977, Well No. 2, OCS-G 3061, Block A-85 Mustang Island Area East Addition, Date of Report: February 28, 1977, 128 p.
14. Environmental Devices Corporation 1978. Tanner Bank Mud and Cuttings Study. (A Monitoring Survey for Exploration Operations on Tanner Bank Area Block 114, January through March 1977) Conducted for Shell Oil Company. Report Date: April 1978, 495 p.
15. Grover, R.D. 1977. Environmental Studies, South Texas Outer Continental Shelf, Rig Monitoring Program 1976. (A Pre-Drilling, During Drilling and Post-Drilling Survey at Mustang Island Area Block 755, 9/25/76-3/2/77). A study conducted by the University of Texas Marine Science Institute, Contract AA550-CT6-17 with Bureau of Land Management. No sequential pages, 14 chapters with 7 appendices, 450 p.
16. Gulf Universities Research Consortium, 1974. The Offshore Ecology Investigation, Final Project Planning Council Consensus Report, GURC Report No. 138, September 20, 1974, 39 p.
17. Gulf University Research Consortium, 1974. Principal Investigation Abstracts, Summaries and Conclusions from the Offshore Ecology Investigation, 1972-1974, together with an extensive collection of project reports, all unpublished, approximately 500 p.
18. Hastings, R.W., L.H. Ogren and M.T. Marby, 1976. Observations on the Fish Found Associated with Offshore Platforms in the Northeastern Gulf of Mexico. Fishery Bulletin: Volume 74, Number 2, 1976.
19. Hollingsworth, H.W. and R.A. Lockhart, 1975. Fish Toxicity of Dispensed Clay Drilling Mud Deflocculants. Dresser Industries, Inc., 8 p.
20. Holmes, C.W. 1973. Distribution of Selected Elements in Surficial Marine Sediments of the Northern Gulf of Continental Shelf and Slope. Geological Survey Professional Paper 814, USGS/DI, U.S. Government Printing Office Stock Number 2401-OS427, 7 p. with maps.
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Zingula, R. P., 1975. Effects of drilling operations on the marine environment. In: Conference proceedings on environmental aspects of chemical use in well-drilling operations held at Houston, Texas on 21-23 May, 1975. EPA-560/1-75-004. pp. 443-450.

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ANNOTATED BIBLIOGRAPHY ON DRILLING MUD STUDIES

Acute Toxicity of Seven Materials to Atlantic Silversides, *Menidia menidia*; to the Calanoid Copepod, *Acartia tonsa*; to the Marine Alga, *Skeletonema costatum* 1976. Toxicity Test Report Submitted to Shell Oil Company. E.G. & G. Bionomics, Marine Research Laboratory, Pensacola, Florida.

The seven materials tested in this static seawater bioassay were saltwater gel mud, ferrochrome lignosulfonate freshwater mud, extended aeration sewage plant effluent, deck drain sump pump effluent, lightly treated ferrochrome lignosulfonate seawater/freshwater mud, filteron sewage treatment effluent, and domestic wastes.

The filteron sewage treatment effluent was the most toxic substance to the silversides (96-hour LC50 of 860 ppm), while two drilling muds, the extended aeration sewage plant effluent, and the deck drain sump pump effluent were least toxic

(96-hour LC50 >100,000 ppm). The lightly treated ferrochrome lignosulfonate seawater/freshwater mud had a 96-hour LC50 of 48,500 ppm.

The saltwater gel mud and ferrochrome lignosulfonate freshwater mud were most toxic to the copepod (96-hour LC50 100 ppm for both). The filteron sewage treatment effluent (96-hour LC50 520 ppm) and sanitary wastes (96-hour LC50 235 ppm) were nearly as toxic as the two muds, while the deck drain sump pump effluent was least toxic (96-hour LC50 87,000 ppm).

The filteron sewage treatment effluent was the most toxic to the marine alga and the sewage plant effluent and deck drain sump pump effluent were least toxic.

Chesser, B. G. and W. H. McKenzie. 1975. Use of a Bioassay Test in Evaluating the Toxicity of Drilling Fluid Additives on Galveston Bay Shrimp. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

A 96 hour static bioassay test was conducted on Galveston Bay white shrimp and brown shrimp to determine the toxicity of various drilling fluid addition. An iron modified Hemlock bark extract (tannin) had a TL50 of 265 ppm; chrome-treated lignosulfonate a TL50 of 465 ppm, iron lignosulfonate a TL50 of 2100 ppm; non-water dispersible defoamer was erratic; low molecular weight polyacrylate had a TL50 of 3500 ppm; and an acid soluble workover additive had a TL50 of 1925 ppm. Concentrations of these materials in the water as a result of drilling operations were considered to be less than the TL50 value determined in the bioassay.

Environmental Operating Conditions for Drilling Authority—Beaufort Sea. 1977. Fisheries and Marine Service, Environment, Canada.

This document describes the restrictions placed on offshore drilling operations in the Canadian Beaufort Sea. Among other things, drilling fluid discharged into the ocean must be diluted with the receiving water prior to discharge. The dilution ratio of receiving water to drilling wastes must be equal to or greater than 25:1 and shall cause no mortality of fish in a standard 96 hour static bioassay test adopted for drilling wastes. Additionally, oil contaminated discharges must maintain a daily average of less than 35 mg/l of oil and grease and can not at any time exceed 50 mg/l of oil and grease.

Falk, M. R. and M. J. Lawrence. 1973. Acute Toxicity of Petrochemical Drilling Fluids Components and Wastes to Fish. Technical Report Series NO; CEN T-73-1, Resource Management Branch, Fisheries and Marine Service, Dept. of Environment, Winnipeg, Manitoba.

Field and laboratory studies were conducted to determine acute toxicities of petrochemical drilling fluids and their constituent chemicals and sump fluids. Drilling fluids were acutely toxic with 96 hour LC50's of 0.83 to 12.0 percent using lake chub and rainbow trout. Sump fluids were comparatively less toxic with one sump yielding 96 hour LC50 values of 22.5 and 81.0 percent for composite and surface sump fluids, respectively. Out of 27 common components of drilling fluids, seven were toxic (LC50 < 100 ppm), six were moderately toxic (LC50 between 100 and 1000 ppm), and five were slightly toxic (between 1000 and 10,000 ppm). A brief description of the nature and function of drilling fluids and their constituent chemicals is also included.

George, R. Y. 1975. Potential Effects of Oil Drilling and Dumping Activities on Marine Biota. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

The objective of this paper is to provide a base for discussing the possible perturbations of oil drilling activities on the biota inhabiting the inner and outer continental shelf regimes. A perusal of literature on this subject points out clearly our inadequate knowledge on the impact of drilling mud components on marine biota and our meager understanding of the chronic effects of spillage of oil on both plants and animals in the marine environment.

On the basis of results obtained in recent offshore ecological investigations in the Louisiana Continental Shelf, efforts are made to evaluate the extent of effects of drilling activities on the biota and the physical environment adjacent to oil platforms. In recognition of the need for arriving at models depicting the impact of drilling activity on the marine ecosystem, inferences are drawn here to consider biological implications of potential effects of drilling discharges under the following four aspects:

- (1) Impact of drilling materials causing "burial effect" on the seafloor benthos.

- (2) Discharge of drilling mud components and their possible accumulation of magnification in the food chain.
- (3) Influence of turbidity-plumes of drilling mud on the filter-feeding fouling organisms.
- (4) Acute and chronic effects of spillage of crude oil on marine biota.

Grantham, C. H. and J. P. Sloan. 1975. Toxicity Study—Drilling Fluid Chemicals on Aquatic Life. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, Sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

Weighting materials have been added to drilling fluids since early in the twentieth century, and the potential environmental impact of the introduction of these additives as industrial compounds is one of contemporary concern. This paper investigates the toxicity of density building materials used in drilling mud; it reviews the nature and purposes of these additives and it generally discusses results of toxicity tests conducted on the weight materials used in drilling fluids. General comments correlating other industrial or professional applications, where possible, are indicated to clarify comparisons of relative safety or toxicity for humans.

Test animal for these fish toxicity tests was *Mollienisias latipinna* and substances tested were barite, calcite and siderite. The authors concluded that concentrations of these materials up to 100,000 ppm are not toxic to fish in either fresh water or sea water.

Hollingsworth, J. W. and R. A. Lockhart. 1975. Fish Toxicity of Dispersed Clay Drilling Mud Deflocculants. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

This paper investigates thinning agents used in simple sodium montmorillonite drilling fluids to deflocculate clay particles and maintain proper gel strengths. Thinning agents (phosphates, tannins, special lignites, and lignosulfonates) stabilize clay dispersion by preventing strong particle association and by decreasing the energy needed to initiate and maintain system flow. The paper describes the application of these thinning agents and reports the results of acute fish toxicity tests.

Test animal for these fish toxicity tests was *Mollienisias latipinna* and substances tested were chrome-ligosulfonate, quebracho (tannin), lignite and sodium acid pyrophosphate. Studies indicated a 96 hour TLM in salt water of 12,200 ppm, 158 ppm, > 15,000 ppm, and 7,100 ppm respectively.

Hoopingarner, J. 1977. Memorandum from Mr. Hoopingarner of Sedco Maritime, Inc. to Mr. Frank Wendling, NMFS, Concerning the meeting on Drilling Mud Discharges.

This memorandum covers the highlight of the joint meeting between Sedco Maritime, Inc., Shell Oil Company, the EPA, USF&WS and NMFS. It was agreed by industry representatives that a discharge rate of 10 barrels per hour could be met and that this discharge would be diluted with as much seawater as possible.

Interim Guidelines for the Disposal of Waste Fluids from Petroleum Exploratory Drilling in the Canadian North. 1975. Prepared by Arctic Petroleum Operator's Association and Environment, Canada.

This document provides a listing of drilling fluid components used in the Canadian North drilling operations and provides a comparison of relative toxicity. The report provides information on chemical composition of these materials, estimates use range and toxicity.

The document also provides interim guidelines pertaining to both onshore and offshore operations, and bioassay procedures.

Land, B. 1974. The Toxicity of Drilling Fluid Components to Aquatic Biological Systems. A Literature Review. Technical Report N. 487. Fisheries and Marine Service, Environment, Canada.

This report is a literature review on the toxicity to aquatic biological systems of drilling fluid components used in northern Canada. This review includes aquatic toxicity literature that was available prior to January 31, 1974. The components of drilling fluids include suspended solids, chlorides, alkaline sources, chromium compounds, bactericides, organic polymers, dispersants, defoamers, lubricants and detergents. On the basis of quantities used and of the harmful long-term effects produced, the alkali sources, bactericides, barium sulphate, bentonite, chromium salts and potassium chloride compromise the major sources of aquatic toxicity.

Suspended solids components of drilling fluids (barium sulphate and bentonite clay) can harm fish directly and indirectly at levels of 100-400 ppm. Potassium

chloride is more toxic to fish than calcium or sodium chloride and can harm fish and crustacean zooplankton at 100-1000 ppm. Compounds possessing ionizable chromium are toxic to aquatic animals at < 1 ppm chromium ions. Information on bactericides, lubricants and detergents are presented also.

Lawler, G. H. 1975. Letter from Mr. Lawler, Director-General, Fisheries and Marine Service, Environment, Canada to Mr. Guy Martin, Commissioner, Alaska Dept. of Natural Resources.

This letter from G. H. Lawler, Director-General, Fisheries and Marine Service, Environment, Canada disputes the opinion of Dr. George Holliday, Shell Oil Company with regard to environmental effects caused by the discharge of drilling fluids. Dr. Holliday referred to the EPA sponsored Conference on Environmental Aspects of Chemical Use in Well Drilling Operations and stated that the conference clearly demonstrated that no adverse effects of mud's use or discharges into the marine environment had been observed. Mr. Lawler felt that the conference served to show the lack of work that has been done on the subject. He further states that Environment Canada has conducted acute toxicity tests using marine fish and invertebrates and have found that drilling wastes are toxic in both fresh water and sea water.

By the time the well is completed these materials have been relegated to the sump where they become a disposal problem. A method of sampling and testing has been outlined, so that the toxicity of sumps can be determined. Guideline outline appropriate action to be taken by the operator and the Government agencies to insure that fluids are disposed of by methods which affect the environment as little as possible.

Rainbow trout were tested with a number of drilling fluid components. Detergents such as rig-wash compounds were lethal at concentrations >200 mg/l; a particular brand of reagent-grade KCl was lethal at concentrations as low as 1 mg/l; sodium salts were toxic at concentrations >20 mg/l; ammonium phosphate and ammonium sulphate are toxic at concentrations <100 mg/l; corrosion inhibitors were very toxic and some lignosulphonate mud thinners were toxic at concentrations >100 mg/l. Other components of drilling fluids and their respective toxicities are listed.

Shinn, E. A. 1974. Effects of Oil Field Brine, Drilling Mud, Cuttings and Oil Platforms on the Offshore Environment. Presented at the Estuarine Research Federation Outer Continental Shelf Conference and Workshop, sponsored by the Bureau of Land Management, Dept. of the Interior, College Park, Maryland.

This paper discusses briefly some known environmental effects of oil field brine, drilling mud, and cuttings discharge on marine organisms in the Gulf of Mexico. Inferences are drawn for other areas. The author concludes that drill muds and cuttings have no detrimental effects in offshore waters of the Gulf of Mexico.

Summary Report of Industry/Government Research on Pollution from Drilling Wastes 1976. Prepared by the Industry/Government Working Group "A" under the auspices of the Arctic Petroleum Operators Association and Environment Canada. Vol. 1.

This report investigates the magnitude of pollution problems associated with onshore and offshore exploratory drilling wastes encountered in the Canadian Arctic. Section I includes a statement on the magnitude of the pollution problem, general recommendations and a list of accompanying research reports. Section II contains the group's recommended interim guidelines for disposal of waste fluids from petroleum exploratory drilling in the Canadian North. Section III contains a review of research on pollution aspects of drilling and sump fluids.

Weir, R. H. and B. Moore, 1975. Acute Toxicity of Well-Drilling Muds to Rainbow Trout, *Salmo gairdneri* (Richardson). Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

The acute toxicity of drilling muds to rainbow trout (*Salmo gairdneri*) was investigated under 96-hour static bioassay test conditions for a Canadian Arctic exploratory well. Samples were taken at various well depths and tested at various concentrations to determine the lethal concentration to 50 percent of the test population in 96 hours (96 hr LC₅₀). In the sample series it was found that the toxicity could be grouped as to its relative abundance of animals by species and phylum.

The author suggests that future studies of this nature should use a variety of muds from different depths and locations. Testing protocols should include effects on structure and function of communities, indirect effects of pollutants, bioaccumulation potential, toxicity of mixtures to organisms indigenous to lease areas, attrac-

tion of marine species to chemicals used in well-drilling operations and mechanism of action in toxicants.

Rietze, H. L. 1977. Letter from Mr. Rietze, Director, NMFS, Alaska Region to Mr. Eugene Griffin, District Operations Manager, Union Oil Company.

This letter discusses the finding of the NALCO Environmental Sciences Report to Union Oil Company of California entitled "Physical and Toxicity Bioassay Studies in Cook Inlet, Alaska During Drilling Operations, June-August, 1976". The NMFS could not endorse the reports statement that "mud being discharged from the Glomar Grand Isle under the conditions tested can have no foreseeable effect on the biota of Cook Inlet".

Robichaux, T. J. 1975. Bactericides Used in Drilling and Completion Operations. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

Bactericides are often added to drilling muds and completion fluids to prevent microbial degradation of organic additives and to suppress the formation of H_2S by SRB. Of all possible additives, bactericides are the only ones which require registration with the Environmental Protection Agency. Efficacy, treating dosages, and environmental effects must be substantiated for registration. The chemical types of bactericides used are aldehydes, chlorinated phenols, quaternary amines, and alkyl amines. Of the several methods by which bactericides can enter the environment from drilling operations, mud and packer fluid disposal present the major mechanism. Because bactericides are made and used to kill living organisms, it is correct to expect them to be hazardous to other living creatures—such as fish and birds. By using proper cautions, the environmental hazards can be minimized. If bactericides used in drilling and completion do enter the environment, most will be removed by natural processes.

Various bactericides and their TL50 values for fish are presented. TL50 values for fish range from a low of 0.025 ppm for Toxaphene to a high of 50-400 ppm for aldehydes.

Shaw, D. R. 1975. The Toxicity of Drilling Fluids, Their Testing and Disposal. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

The composition of drilling fluids is often complex, and the various components and combinations of chemicals are frequently quite poisonous.

Lawrence, M. and E. Scherer. 1974. Behavioural Responses of Whitefish and Rainbow Trout to Drilling Fluids. Technical Report No. 502. Fisheries and Marine Service, Environment, Canada.

Behavioural responses of whitefish (*Coregonus clupeaformis*) and rainbow trout (*Salmo bairdneri*) to drilling mud (1 to 1000 ul/l) and its supernatant fraction (55 to 10,000 ul/l) were tested in laboratory experiments. Experiments were run under infrared as well as under visible light, to separate photically from chemically elicited responses.

Four response parameters were recorded and analyzed: (1) percent test time spent in pure compared to contaminated water, (2) effect of contact with contaminant on swimming speed, turning rate, and frequency of movements across the centerline of the test chamber (boundary between pure and contaminated water), (4) time spent at the end walls of the pure vs contaminated water side.

Conclusions on preference or avoidance are derived from these behavioural elements. The results are discussed with regard to LC50 values of drilling fluids.

Both whitefish and rainbow trout showed preference for mud suspensions at 1000 ul/l, the maximum concentration tested. This value represents a 96 hour LC 50 of 0.04 and 0.013 for whitefish and rainbow respectively.

Marine Toxicity Studies on Drilling fluids Wastes, Project No. 6114, Final Report 1975. Prepared for Working Group "A", APOA/Government Research Program on Drilling Fluid Wastes, Environment, Canada. Prepared by Division of Applied Biology, B.C. Research, Vancouver.

Acute toxicity of seven Arctic drilling fluid wastes to freshwater and seawater acclimated salmonid fishes and to four intertidal invertebrate species (worms, clams, crabs and shrimp) were determined using 96 hour LC50 static bioassays. Five out of seven samples were toxic to seawater-acclimated coho salmon at concentrations of less than 5 percent v/v. Three samples were toxic to all invertebrate species tested at concentrations of less than 8 percent v/v; the remaining four samples were less

toxic with 96 hour LC50 values ranging from 20 percent to >56 percent. Rainbow trout, coho, chum and pink salmon showed a similar tolerance to a sample of drilling fluid waste in seawater bioassays. Fish species were more sensitive to the drilling wastes than were any of the invertebrate species. Crabs were among the most tolerant organisms on all tests.

McAuliffe, C. D. and L. L. Palmer. 1976. Environmental Aspects of Offshore Disposal of Drilling Fluids and Cuttings. Paper No. SPE 5864. Prepared for Presentation at the 46th Annual California Regional Meeting of the Society of Petroleum Engineers of AIME, Long Beach, California.

This report presents a brief review of drilling practices, composition of drilling fluids, bioassays on selected drilling fluids by Chevron oil research people, bioassays on drilling fluids and their components as reported in the literature, observations of marine life in areas where drilling has occurred for long periods of time and a comparison of fluid and cuttings discharges with sediment inputs from rivers and storm-resuspended nearshore and sea bottom sediments. The authors concluded that offshore discharge of drilling fluids and cuttings is an environmental acceptable method of disposal of drilling wastes.

Monaghan, P. H., C. D. McAuliffe, and F. T. Weiss (Sheen Technical Subcommittee) 1976. Environmental Aspects of Drilling Muds and Cuttings from Oil and Gas Extraction Operations in Offshore and Coastal Waters. Prepared for Offshore Operators Committee.

This report summarized information published on environmental aspects of drilling muds and cuttings discharge from offshore oil rigs. Included in the report are well histories and laboratory results used in estimating concentration of mud components, reviews of reports of underwater observation during actual discharges of mud and cuttings, and laboratory bioassay result for materials used in drilling muds. The authors conclude that normal discharge of drilling muds and cuttings do not harm marine organisms. They further concluded that petroleum structures and cuttings piles can have a beneficial effect on the marine environment.

Physical and Toxicity Bioassay Studies in Cook Inlet, Alaska During Drilling Operations June-August 1976. 1976. Prepared for Union Oil Company of California by Nalco Environmental Science, Northbrook, Illinois.

Nalco Environmental Sciences conducted a drilling mud discharge dispersion study and a series of experiments to assess drilling muds toxicity to several marine organisms. The dispersion study was conducted using a fluorescent dye (Rhodamine WT). The greatest dye concentration was recorded immediately adjacent to the drilling rig at a depth of 12 meters, where the concentration was 2.14 ppb, or 0.0035 percent of the dye introduced into the moon pool.

Static 96 hour toxicity bioassays using whole drilling muds and sea water extracts from drilling muds were conducted on pink salmon fry, shrimp, copepods, and mysids. The drilling was found to be not toxic to salmon or shrimp at concentrations of <10 percent. Some mortalities occurred in mysids within 48 hours at concentrations of >7.5 percent. Results obtained on the copepods were considered questionable. It was concluded that muds discharged into Cook Inlet from the drilling rig presented no biological hazards under the conditions examined during the study.

Ray, J. P. 1975. Environmental Effects of Drilling Muds and Cuttings. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

In 1973, a Shell research group studied some of the environmental parameter concerning offshore drilling discharges. During a 2-day period in 1973, they collected 34 water samples around a Shell platform off the coast of Louisiana. Samples were taken at the surface (1 ft), midwater (120 ft) and at the bottom (245 ft). The platform was actively drilling at the 9,000 ft level with lime base mud at the time. Analyses were made for alkalinity, total dissolved solids, total suspended solids, total organic carbon, and total dissolved chromium. Results indicate that all parameters approached normal background levels as close as 60 yards to the platform. Mid-and bottom-water samples beneath the platform showed some detectable chromium, but hexavalent chromium was not detected in any samples.

Theoretical dilution curves were estimated for a current of 0.5 feet per second and discharge rates of 40 and 250 barrels per hour. Dilutions of 1,000:1 were estimated at approximately 1,000 and 10,000 feet, respectively.

The importance of environmental observations is stressed. Mr. E. A. Shinn, an experienced diver and underwater photographer, has observed marine life under

Gulf of Mexico platforms for many years. He has observed that the light mud fractions appear to drift upward and laterally, while the cutting chips and filter cake fall straight to the bottom. Encrusting organisms are observed prolifically covering platform structures. Barnacles are seen living on and inside discharge downpipes. Fish swim through discharge material with no observable ill effects.

There appear to be no visual detrimental effects of drilling discharges to organisms that are living above the bottom. Cutting piles beneath production platforms have been observed to be repopulated with marine communities.

Richards, N. L. Effects of Chemicals Used in Offshore Well-Drilling Operation U.S. Environmental Protection Agency, Environmental Research Laboratory, Gulf Breeze, Florida.

A study was conducted to determine the ecological effects on marine and estuarine organisms of pollutants from oil and gas extraction. In the author's opinion, acute static bioassays have little relevance to environmental conditions in which drilling and discharges occur. The experimental design used in this study follows a tiered screening sequence whereby progressively more complex and time-consuming tests are conducted on fewer compounds as the testing sequence continues.

Static toxicity tests with sodium pentachlorophenate were conducted with larval stages of eastern oyster, grass shrimp, and pinfish. The LC_{50} values obtained and the exposure period were <100 ug/l, 48-hr; 649 ug/l, 96-hour, and 38 ug/l, 96-hr, respectively. A similar study with Dovicide G (79 percent PCP) and pinfish larvae resulted in a 96 hour LC_{50} of 66 ug/l. A bioconcentration study with oysters exposed to sodium pentachlorophenate in flowing seawater for 28 days demonstrated a bioconcentration of 80 times that measured in the exposure water. Similar exposure experiments were done with barium sulfate.

Effects of pentochlorophenol of development of estuarine settling communities were also studied. This study revealed that individuals and species of the numerically dominant phyla (Annelida, Arthropoda and Mollusca) decrease as concentration increased and that sensitivity differed among species of the same phylum. It was concluded, therefore, that pentachlorophenol altered the structure of experimental macrofauna communities by changing the relationship with the active mud system and the depth at which the sample was taken. Results of the toxicity analyses defined three distinct groups of toxicity. The first toxicity group exhibited an LC_{50} value of <20 percent mud concentration by volume. The dominant toxic factor being the high level of KCl that was used in drilling the surface portion of the hole. The second toxic group, exhibited LC_{50} values in the range of 36 to 70 percent mud concentration by volume. The toxicity of this group was characterized by the lack of a dominant chemical or physical toxicant. The toxic action appeared to be the result of the combination of the drilling components present within the unweighted mud system (8.8-9.3 lb/gal). The third toxic group exhibited LC_{50} values of 9 to 16 percent mud concentration by volume. Toxicity characterization was generally a continuation of the multifactor toxicity of group two, but at a much higher toxic level due to the increase in solids and viscosity that are associated with weighted muds.

Thompson, J. H. and T. J. Bright. 1977. Effects of Drill Mud on Sediment Clearing Rates of Certain Hermatypic Corals. Oceanography Department, Texas A&M University, College Station, Texas.

The hermatypic corals *Diploria strigosa*, *Montastrea annularis* and *Mantastrea cavernosa* were subjected to large uniform doses of four sediments used whole drill mud, barite, aquagel and calcium carbonate (a sediment occurring naturally on coral reefs). The rates at which each species cleared itself of the sediment covers were measured in square millimeters per hour. No corals were able to remove the used whole drill mud, but all could rid themselves effectively of the other three sediments. *Diploria strigosa* exhibited a generally faster clearing rate than the other two species, but there was no difference in the rates at which any one species cleared itself of either barite, aquagel or calcium carbonate. It is suspected that the dramatic effect of used whole mud, which also caused mortality, was due to dissolved chemical components which we have yet to identify.

Watson, G. W. 1975. Letter from Mr. Watson, Area Director, U.S. Fish and Wildlife Service to Mr. Guy Martin, Commissioner. Dept. of Natural Resources.

This letter concerns a statement made by Dr. George Holliday of Shell Oil Company in reference to the 1975 EPA Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, held in Houston, Texas. Dr. Holliday stated that presentations made at the conference "clearly demonstrated that there were no adverse effects of mud use or discharge on the marine or land environ-

ment". The letter from Mr. Watson refutes Dr. Holliday's statement and defines the position of the U.S. F&WS.

Wright, D. G. 1975. Observations and Reflections on the Conference: Environmental Aspects of Chemical Use in Well-Drilling Operations.

Mr. Wright expressed concern over some of the papers presented and felt that some researchers apparently had only a rudimentary understanding of fish bioassay techniques. He outlined his concerns over usage of exotic chemicals in drilling fluids because of potential for sublethal effects and bioaccumulation. Mr. Wright stated that the conference merely emphasize lack of understanding of the problems associated with offshore operations.

Zungula, R. P. 1975. Effects of Drilling Operations on the Marine Environment. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

Studies by Exxon scientists and others show that offshore drilling operations are not as harmful to the marine environment as some people have either proposed or feared. In the Louisiana offshore and many other areas, rivers contribute so much sediment that any resulting from drilling is negligible. Water samples taken while drilling show a very rapid drop, to a low level, of suspended solids in a short distance downstream from the rig.

Cuttings accumulating on the sea bottom do not create deserts. Studies made using scuba show that mobile organisms are active on the surface of the pile even while drilling is going on; and in a few months' time these organisms turn it into "normal" sea bottom.

Analyses have been made of seawater samples downstream from drilling operations. The common chemicals normally used in drilling—caustic, barite, chrome lignosulfonate, etc.—are present in such small quantities that chemical interaction and dilution make their effect negligible.

Zitko, V. 1975. Toxicity and Environmental Properties on Chemicals Used in Well-Drilling Operations. Presented at the Conference on Environmental Aspects of Chemical Use in Well-Drilling Operations, sponsored by the Environmental Protection Agency's Office of Toxic Substances, Houston, Texas.

Acute toxicity to fish and other environmental effects of drilling mud components are discussed. The components include solids, particularly barite, polymers, and low molecular weight organic compounds. Acute toxicities in terms of 96hLCO (juvenile Atlantic salmon, *Salmo salar*) were estimated for a number of organic components of drilling mud on the basis of correlations with octanol-water partition coefficients and Hammett σ constants. The components include 4- and other substituted 1,2-dihydroxybenzenes, benzoic acids, and naphthalenes. Acute toxicity of several substituted imidazolines and sodium petroleum sulfonates is reported.

It is concluded that the most pronounced environmental effects of drilling mud may be due to physical action of suspended solids. Organic additives may possibly be selected in such a way that the use of highly toxic compound will be eliminated.

REVIEW OF THE TOXICITY AND BIOLOGICAL EFFECTS OF USED OFFSHORE DRILLING FLUIDS TO MARINE ANIMALS

(Prepared by Jerry M. Neff, Ph. D., Associate Professor, Department of Biology, Texas A. & M. University)

This review was written in response to proposed Senate Bill No. S2119, The Georges Bank Protection Act. The author is a recognized authority in the field of marine toxicology and has authored two books and more than sixty scientific research articles dealing with the effects of pollutants on marine animals and ecosystems. For the past two and a half years the author's laboratory has conducted extensive research on the effects of used offshore drilling fluids on marine organisms. Field muds (Used muds) instead of laboratory muds have been used throughout.

Based on this review, the author concludes that typical used offshore water-based drilling muds have a relatively low order of acute toxicity to even the most sensitive species and life stages of marine animals. Based on toxicity data, drilling mud dispersion/dilution observations, and hydrography of the Georges Bank, it is concluded that discharge of used drilling mud to the ocean from exploratory platforms on Georges Bank would have no short or long-term impact on marine biota of this valuable ecosystem. In addition heavy metals associated with used drilling muds have a very limited bioavailability to marine animals. Therefore, it is extremely

unlikely that any metals would be accumulated from discharged muds by marine animals to levels in the edible tissues which would pose a health hazard to human consumers of fishery products from Georges Bank.

INTRODUCTION

More than 23,000 oil wells have been drilled to date in the coastal and offshore waters of the United States (McAuliffe and Palmer, 1976; Monaghan et al. 1977). Offshore exploration for oil is expected to increase substantially in the coming decade as onshore reserves are depleted. Large volumes of drilling fluids (muds) are used in these offshore drilling operations. Between 10 and 40,000 bbl of mud and cuttings may be discharged during drilling of a single exploratory well. Water-based muds but oil-based muds may be discharged to the ocean intermittently during the drilling of the well and in bulk quantities at the end of the drilling operation (Shinn, 1974; McGuire, 1975; Ray, 1979). Concern has grown in recent years that this practice may be damaging to sensitive or highly productive marine ecosystems such as the Flower Gardens of the Texas-Louisiana Coast and the Georges Bank off New England (Richards, 1979).

The two major environmental concerns relating to the discharge of used drilling muds to the oceans are that: 1) the muds may be acutely toxic or produce deleterious sublethal responses in sensitive marine species, and (2) degradation of some organic components of the mud (Carney, 1973; Knox, 1976). However, such bioassays are useful for determining what drilling mud components are most toxic and which ones may contribute most to the toxicity of whole used drilling muds. Bioassays in fresh water with freshwater animals can not be extrapolated to the marine environment since the mechanisms of drilling mud-mediated toxicity appear to be different in marine and fresh water systems. Based on recent observations of Hrudey (1979) and Sprague and Logan (1979), it appears that the main cause of toxicity of some used drilling muds to fresh water organisms is related to the high pH and high salt content (especially potassium) of the mud. Fresh waters have low ionic concentrations (by definition) and are poorly buffered. Freshwater animals are generally very sensitive to changes in pH and ionic concentration of the ambient medium. Seawater, because of its high ionic strength, has a high buffer capacity. Marine animals are more tolerant than freshwater species to small changes in ionic concentration of the medium. Therefore, KCl muds which are quite toxic to freshwater fish are quite innocuous to marine species and alkaline muds like most chrome lignosulfonate muds have little effect on seawater pH except at very high concentrations.

McLeay (1975) studied the toxicity of seven Arctic drilling fluid wastes to seawater and freshwater-acclimated salmon and four species of Arctic marine intertidal invertebrates. Five of the seven drilling fluid samples were toxic to seawater-acclimated coho salmon (*Oncorhynchus kisutch*) at concentrations of less than 5 percent v/v (50,000 ppm). The most toxic drilling fluid had a 96-hour LC50 of less than 1.5 percent v/v (15,000 ppm). The four marine invertebrates included the clam worm *Nereis virens*, the soft shelled clam *Mya arenaria*, the purple beach crab *Hemigrapsus nudus*, and sand flea *Orchestia traskiana*. Acute toxicity, measured as 96 hour L050, ranged from 1.0 to greater than 56 percent v/v. For most the MAF did not change significantly with time, the concentration of hexane-extractable, UV-absorbing "aromatic hydrocarbons" decreased rapidly in the static MAF. This apparently volatile material, which may include petroleum aromatics and UV-absorbing byproducts of lignosulfonate and lignite, appears to contribute significantly to the acute toxicity of the MAF.

TABLE 1.—COMPOSITION OF USED DRILLING MUDS

Seawater chrome lignosulfonate mud (CLS).—

Major components: Seawater, bentonite clay, chrome lignosulfonate, lignite, caustic soda (NaOH), and barite (BaSO₄).

Midweight lignosulfonate mud (MWL).—

Major components: Freshwater, bentonite clay, chrome lignosulfonate, lignite caustic soda, lime (Ca(OH)₂), and barite.

Minor components: Defoamer, oxygen scavenger, walnut lost circulation material, and gilsonite (a natural bituminous material).

High weight lignosulfonate mud (HWL).—

Major components: Freshwater, bentonite clay, chrome lignosulfonate, lignite caustic soda, soda ash (Na₂CO₃), sodium bicarbonate, polyanionic cellulose derivative, and barite.

Minor components: Defoamer, lubricant, and mica lost circulation material.

Spud Mud (Spud).—

Major components: Fresh, bentonite clay and caustic soda.

Minor components: Barite.

TABLE 3.—USED DRILLING MUD EXPOSURE MEDIA USED IN BIOASSAYS AND UPTAKE/RELEASE STUDIES¹

A. Mud Aqueous Fraction (MAF). One part by volume of drilling mud is added to nine parts artificial seawater (Instant Ocean, Aquarium Systems, Inc.) of the appropriate salinity. The mixture is stirred thoroughly and then allowed to settle for 20 hours. The resulting supernate (100 percent MAF) is diluted with artificial seawater to the appropriate concentration and used immediately. The 100 percent MAF contains the water-soluble and fine particulate fractions of 100,000 ppm mud in water.

B. Suspended Particulate Phase (SPP). One part by volume of drilling mud is added to nine parts artificial seawater. The mud-water slurry is air-mixed with filtered compressed air for thirty minutes, with manual stirring every ten minutes. The suspension is then allowed to settle for four hours before the supernate (100 percent SPP) is siphoned off for immediate use in bioassays. The SPP resembles the MAF except that the SPP contains a higher concentration of particulates and lower concentration of volatiles.

C. Suspended Solids Phase (SSP). Known volumes of drilling mud are added to artificial seawater and the mixture is aerated vigorously during the bioassay to keep particulates in suspension.

D. Layered Solid Phase (LSP). A measured volume of mud is layered over clean natural sediment in an aquarium. Natural seawater is added with minimal resuspension of mud. After 24 hours the water is decanted and replaced with clean seawater to remove mud solubles. Animals are added after 24–48 hours settling.

The suspended solids phase (SSP) preparation of the used CLS mud was toxic to young pink and brown shrimp *Penaeus durorum* and *P. aztecus* at a concentration of 10 ml/liter (equivalent to 10,000 ppm). (Table 5). Thus the suspended solids phase preparation appears to be somewhat more toxic to young penaeid shrimp than the mud aqueous fraction. Therefore, the settleable particles, present in the SSP and not in the MAF, contribute to the toxicity of the drilling mud to sensitive species, perhaps by clogging the gills and interfering with respiration. The three other species examined, an oceanic crab and two bivalve molluscs, were unaffected by exposure to 20 ml/l (20,000 ppm) SSP preparation.

Five species of marine invertebrates varied substantially in their sensitivity to the layered solids phase (LSP) preparation of the used chrome lignosulfonate drilling mud. (Table 6). Adult marine worms *Neanthes arenaceodentata* and adult coquina clams *Donax variabilis* seemed to be quite sensitive to this mud preparation, whereas the other species and life stages tested were more tolerant. The concentration used in this bioassay produced a layer of drilling mud 5 to 20 mm thick on the sand substrate of the exposure tank.

TABLE 6.—RESULTS OF BIOASSAYS WITH FIVE SPECIES OF MARINE INVERTEBRATES EXPOSED TO THE LAYERED SOLID PHASE (LSP) OF A USED CHROME LIGNOSULFONATED DRILLING MUD

	Species						
	<i>Neanthes arenaceodentata</i>		<i>Ophryotrocha labronica</i> ; Adults	<i>Mysidopsis almyra</i> ; 1-day old	<i>Donax variabilis texasiana</i>		<i>Aequipecten amplicostatus</i> ; Adults
	Juveniles	Adults			Juveniles (<1 cm)	Adults (<2 cm)	
Exposure concentration (ml/l)	40	40	50	25	100	100	20
Salinity (o/oo)	32	32	34	20	35	35	20
Number of animals per treatment	40	25	20	100	25	25	10
Exposure period (hours)	96	96	96	168	96	96	96
Percent survival	77.5	25	95	55	23	0	40

Note.—Exposure concentrations are in ml mud/liter seawater.

¹ These mud-seawater preparations are similar to several recommended for dredge material bioassays in: EPA/USACE (1977) Ecological Evaluation of proposed discharge of dredged material into ocean waters. Technical committee on criteria for dredged and fill material. Environmental Effects Laboratory U.S. Army Waterways Experiment Station, Vicksburg, MS.

The four used drilling muds varied in their toxicity to several species of marine animals (Neff *et al.*, 1980 b). The mud aqueous fraction of the used spud mud was completely nontoxic to all species tested. (Table 7). In most cases the MAF of the mid-weight lignosulfonate drilling mud was more toxic than the MAF of the seawater chrome lignosulfonate mud and the high weight lignosulfonate mud. The 96 hr LC50 of the MAF of the three used chrome lignosulfonate muds ranged from 12.8 percent MAF for first day postlarvae of opossum shrimp (Table 8) to greater than 100 percent MAF for adult grass shrimp *Palaemonetes pugio* and the marine worm *Ophryotrocha labronica* (Table 7).

The toxicity of the suspended particulate phase (SPP) preparation of the drilling muds was also evaluated (Table 9). The acute toxicity of the SPP of the lignosulfonate muds ranged from 12-74% SPP (12,000-74,000 ppm mud added). Spud mud was completely non-toxic. Adult coquina clams *Donax variabilis* were more sensitive than juvenile Pacific oysters *Crassostrea gigas* to the lignosulfonate muds. Much of the toxicity of these muds appears to reside in the water-soluble fraction of the mud, as indicated by the observation that 96-hour LC50s for the MAF and SPP of high weight lignosulfonate mud were similar for the grass shrimp *Palaemonetes pugio*.

TABLE 9.—TOXICITY OF THE SUSPENDED PARTICULATE PHASE (SPP) PREPARATION OF FOUR USED OFFSHORE DRILLING MUDS TO ADULT COQUINA CLAMS "DONAX VARIABILIS TEXASIANA", TWO SIZE CLASSES OF SPAT OF THE PACIFIC OYSTER "CRASSOSTREA GIGAS", AND 10-DAY OLD ZOEAE OF THE GRASS SHRIMP "PALAEMONETES PUGIO"; 96-HOUR LC50 VALUES ARE IN PERCENT OF THE STOCK SPP PREPARATION

Species	Mud type ¹			
	CLS	MWL	HWL	Spud
<i>Donax vareabilis</i> (adults)	54	29	56	im ²
<i>Crassostrea gigas</i> (3 to 10 mm)		53	74	im
<i>Crassostrea gigas</i> (10 to 25 mm)		50	73	im
<i>Palaemonetes pugio</i> (10-day old)			12	

¹ CLS, chrome lignosulfonate mud; MWL, mid-weight lignosulfonate mud; HWL, high-weight lignosulfonate mud; spud mud.

² im, insufficient mortality to compute LC50 value.

The laboratory of Dr. E. S. Gilfillan at Bowdoin college in Brunswick, Maine has performed similar bioassays with northern cold-water marine animals. Five used offshore drilling muds were used, the four described above plus a low weight lignosulfonate mud obtained from an exploratory platform in the Baltimore Canyon. Acute toxicity of the MAF of these muds to several marine species is summarized in Table 10. Generally the northern marine species were more tolerant than the warm-water species to the MAF. Only stage I larvae of the shrimp *Pandalus borealis* and stage V larvae of lobsters *Homarus americanus* were sensitive to the MAF. Some of the crustaceans and the sea scallop *Placopecten magellanicus* were sensitive to the lignosulfonate muds as a solid substrate on natural sediment. Suspended whole or at a maximum concentration of 15 ml/l was not acutely toxic to any species tested.

The results reported above show that for the majority of used offshore drilling muds examined to date, concentrations lower than 10,000 ppm mud added (greater than 100 to 1 dilution) are not likely to cause serious acute damage to marine organisms. Even for the most toxic used mud reported to date a dilution of 20,000 to 1 will render the mud nontoxic. During a high rate discharge of drilling mud (750 bbl/hr) from an exploratory platform on the Tanner Bank off Southern California, the 100 to 1 dilution of drilling mud total suspended solids was reached in 0-3 meters from the discharge pipe and the 20,000 to 1 dilution was reached between 74 and 500 meters down current from the discharge (Ecomar, 1978). In a similar study on an exploratory platform in the Gulf of Mexico, a 20,000 to 1 dilution of drilling mud discharged at a rate of 1000 bbl/hr was reached within 150 meters of the discharge (Ayers *et al.* 1980).

It is extremely unlikely that any organism in the vicinity of a mud discharge will actually be exposed continuously to high concentrations of mud for 96 hours (the length of time used in most acute toxicity bioassays) and certainly not for 42 days (length of life cycle bioassay with *Mysidopsis bahia*, Conklin *et al.* 1980). During drilling, mud is discharged intermittently and high concentrations exist only near the discharge point and only for short periods of time. More detailed information

about the nature of drilling mud discharges is presented in Dr. Ayers' comments. In the open ocean, drilling mud is dispersed and diluted rapidly over large areas. This is especially true of the more toxic soluble and fine particulate fractions. Thus we can conclude that damage to marine organisms and ecosystems from routine discharges to the ocean of typical offshore drilling muds will be minimal to nonexistent.

Bioavailability of heavy metals from drilling muds

Water-based drilling muds, which are used in nearly 80 percent of all drilling operations (Ray 1979), are usually mixtures of clays, inorganic salts and a variety of organic and metal-organic compounds in fresh or salt water. Heavy metals which have been detected at measurable concentrations in some drilling mud samples include barium, chromium, lead, zinc, cadmium, copper, and iron (Falk and Lawrence, 1973; Lawrence and Scherer, 1974; Siferd, 1975; Moore et al. 1975). Elevated concentrations of barium, chromium, zinc, cadmium, and lead, presumably derived in part from discharged drillingmuds, have been reported in the water and bottom sediments in the immediate vicinity of off-shore exploratory wells (Holmes and Barnes, 1977; Ecomar, 1978). The important question relating to these heavy metals is whether marine animals can accumulate them in their tissues from the water or sediment to concentrations high enough to be toxic to the animals themselves or a health hazard to human consumers of these fishery products.

Recently Liss et al. (1980) studied the concentrations of barium, chromium, iron and lead in used drilling muds, in the liquid (soluble) phase of drilling muds, in seawater suspensions of mud, and in the tissues of the sea scallop *Placopecten magellanicus*. Chromium, iron, and lead concentrations in the liquid phase of whole muds were higher than expected based on the solubility of the respective hydroxides. Concentrations of barium and chromium in solution in seawater suspensions of mud were also higher than expected. These soluble metals were apparently complexed with soluble organic additives, particularly lignosulfonates, in the mud. In scallops exposed to 1g/l of a used low density chrome lignosulfonate drilling mud from the Baltimore Canyon for 27 days, chromium concentration in the kidney rose to nearly 3 ppm, compared to about * * * in the edible muscle tissues of the animals. Therefore, it is extremely unlikely that marine animals on the Georges Bank will accumulate heavy metals from discharged used drilling muds to concentrations which are harmful to the animals themselves or that pose a health hazard to human consumers of fishery products.

TABLE 11.—ACCUMULATION OF CHROMIUM BY MUSSELS "MYTILUS EDULIS" DURING EXPOSURE TO CHROMIUM IN DIFFERENT FORMS FOR 7 DAYS

Exposure mixture	Cr in exposure medium (mg/l)	Cr in Mussel Tissue (ug/g dry weight)			
		0 days	1 day	4 days	7 days
Seawater control	0.1	1.3	0.7	0.3	1.6
MAF of mid-weight mud	1.4	1.0	3.7	5.8	6.6
Ferrochrome lignosulfonate.....	0.7	1.0	4.1	10.0	12.5
Ferrochrome lignosulfonate.....	6.0	1.0	25.3	38.7	63.9
Cr ³⁺ solution (CrCl ₃)	0.6	1.0	36.7	44.3	49.5

Note.—Data from page et al., 1980.

FIGURE 1.—Accumulation of chromium by the marsh clam *Rangia cuneata* during exposure to reference sediment from San Antonio Bay, Texas (containing 20 mg Cr/kg dry weight) and to a layered solid phase preparation (LSP; 1:16 drilling mud: seawater) of used seawater chrome lignosulfonate drilling mud (containing 485 mg Cr/kg dry weight) with or without a 24 hour period in clean seawater after exposure. Vertical bars represent standard deviation of mean for 10 clams.

TABLE 12.—CONCENTRATIONS OF SEVERAL HEAVY METALS IN FOUR USED DRILLING MUDS AS DETERMINED BY FLAME ATOMIC ABSORPTION SPECTROPHOTOMETRY. ALL CONCENTRATIONS ARE IN MG METAL/KG DRY MUD (PPM), AND STANDARD DEVIATION OF TWO REPLICATE ANALYSES. VALUES IN PARENTHESES ARE CONCENTRATIONS DETERMINED BY ARGON PLASMA EMISSION SPECTROPHOTOMETRY

Mud	Drilling mud ¹			
	C.S.	MWL	HWL	Spud
Cadmium.....	3.0±0.7 (1.20)	19.2±1.5 (15.86)	10.9±3.5 (3.04)	3.5±1.5 (7.23)
Chromium.....	485.2±4.4 (395.0)	416.7±8.5 (473.0)	224.9±3.5 (287.0)	10.9±0.5 (70.90)
Copper.....	48.2±7.9	127.0±8.5	118.8±8.4	30.2±3.3
Lead.....	179.4±27.8 (68.57)	915.3±45.7 (477.0)	209.5±13.8 (124.6)	134.2±20.9 (81.70)
Zinc.....	251.4±52.8	604.8±13.1	274.5±35.4	297.3±1.6

¹ C.S., seawater chrome lignosulfonate mud; MWL, mid weight lignosulfonate mud; HWL, high weight lignosulfonate mud; Spud, spud mud.

TABLE 13.—CONCENTRATION OF CHROMIUM IN TISSUES OF SPAT OF THE OYSTER "CRASSOSTREA GIGAS" EXPOSED TO THE MAF OF USED HIGH WEIGHT AND MID WEIGHT LIGNOSULFONATE DRILLING MUDS. EACH VALUE REPRESENTS A POOLED TISSUE SAMPLE OF TWENTY SPAT. VALUES ARE IN MG CR/KG DRY TISSUE CONTROL SPAT CONTAINED A MEAN OF 1.91 MG CR/KG DRY TISSUE

Mud type	Exposure concentration (percent MAF)	Exposure duration (days)			
		1	2	7	14
HWL.....	20	3.63	2.19	3.61	3.99
	40	2.74	2.85	5.72	4.17
MWL.....	20	3.94	3.73	4.49	5.55
	40	5.37	4.19	5.36	7.53

TABLE 15.—CONCENTRATIONS OF ZINC IN TISSUES OF OYSTER SPAT "CRASSOSTREA GIGAS" EXPOSED TO A 40 PERCENT MAF OF USED HIGH WEIGHT LIGNOSULFONATE MUD (HWL) AND USED MID WEIGHT LIGNOSULFONATE MUD (MWL) AND TO A 100 PERCENT MAF OF SPUD MUD. CONCENTRATIONS ARE EXPRESSED AS MG ZINC/KG DRY TISSUE WEIGHT (PPM). EACH VALUE REPRESENTS A POOLED SAMPLE OF SOFT TISSUES OF 30-40 SPAT

Mud		Exposure period (days)				
		0	1	2	5	10
Spud.....	74.07	79.40	69.08	75.17	80.99	
HWL.....	69.93	65.48	56.62	63.33	71.41	
MWL.....	62.21	69.60	58.35	58.03	73.47	

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STATEMENT OF HON. GERRY E. STUDDS, U.S. REPRESENTATIVE FROM MASSACHUSETTS

Mr. STUDDS. Thank you, Mr. Chairman.

Senator TSONGAS. Let me welcome my colleague. You seem to have a repellant effect on Senators from Kentucky for some reason. Don't take that personally.

Mr. STUDDS. I assume that now Massachusetts is in control of that procedure, I can simply defer and you will proceed to mark up the bill.

Senator TSONGAS. Hearing no objections—

Mr. STUDDS. Thank you, Mr. Chairman, my colleague from Massachusetts. I am sorry Senator Ford left because I was going to begin, in fact I will begin in any event with an expression of appreciation to both Senator Ford and Senator Cannon. You did not hear their opening remarks. I hope you will have a chance to look at them.

By virtue of both their initial statements and the questioning of both Senators, it's quite clear that an extraordinary amount of preparation was done by the Senators themselves and by their staff. I would like to express, as I say, both appreciation and respect for that. That is not always the case on the other side of the Hill, as you will recall. It's a very moving thing to see.

As you know, and I would like the record to reflect, I represent that area of the continental United States closest to Georges Bank

where the drilling will likely take place, the southeastern part of our State, particularly Cape Cod, Nantucket, Martha's Vineyard, and as you also well know, the largest fishing port on the east coast of the United States, the city of New Bedford.

I think, having heard the first two witnesses against the bill, that we really don't need any witnesses in favor of the bill, but let me proceed to summarize my testimony if I can and ask that it appear in its entirety in the record.

We have just begun. Georges Bank, according to the National Marina Fisheries Service, is the richest single fishing grounds on the face of the Earth, roughly twice the productivity of the North Sea and some four times the productivity of the fabled Grand Banks of Newfoundland. So when one speaks of balancing decisions here—Senator Ford pointed out that the most optimistic estimates of the Georges Bank may be some 6 or 7 days of oil given current rates of consumption—when one balances that in a rational way against the renewable sources of protein, one gets some perspective of where we ought to be. I want to congratulate you on S. 2119 along with our senior colleague. I was pleased to see there is an appreciation for the uniqueness of the politics of our State here. That also eludes people from time to time in this city.

Senator TSONGAS. Not to mention some primary States.

Mr. STUDDS. That's correct. Let me say that I don't believe that either the Senators or myself or the other members from coastal regions in New England have ever opposed offshore drilling per se. We have simply asked that every conceivable safeguard be taken which our knowledge permits us to take. We have made a number of important steps in that direction over the past 5 or 6 years. We have the OCS amendments, the Fisheries Conservation and Management Act, a number of other statutes and have indeed had a number of concessions from the Interior Department with respect to deletion of particularly sensitive tracts.

I must say, unfortunately, that most of those concessions were made by the preceding Secretary of the Interior under the preceding administration; an agreement, for example, not to lease anything within 50 miles of shore was an agreement made by Mr. Ford's administration, and which we are incapable today of extracting from the current administration with respect to sale 52 scheduled for 1982.

For several months, as you well know, our objections have been based on the contention that in allowing the dumping on site of drill mud and cuttings and formation waters, that we are not meeting the minimal standard of taking those safeguards of which our technology is capable. I would like to share with the committee, if I may, the results of a hearing which my own Subcommittee on Oceanography in the House conducted last month.

Let me just say that hearing was preceded by assurances from the Interior Department, initially by Ms. Ross, who preceded me here today, and subsequently by the Secretary himself that we had plenty of evidence that drill muds were not toxic or harmful to the marine environment.

Finally, Ms. Ross and the Secretary assured us they had "a shelf full of studies" on that effect and that we were going to proceed in a way that was environmentally sound given our scientific knowledge today.

We first requested last December that "shelf full of studies" because it runs counter, that contention, to my understanding of the existing state of scientific knowledge. We have yet to receive a single volume, much less a shelf, from the Department of the Interior in support of that contention.

I was assured in testimony that the composition of drill muds was well known to the Department and that based on that knowledge and the studies we have made of those muds and substances, that we could safely conclude that there was no particular hazard to marine life based on onsite disposal of these materials.

Secretary Andrus in February of this year reassured us that while he said the information was proprietary, nonetheless it was available to the Government and we were able to make these determinations. He also assured us the drill muds would be shunted beneath the surface that and would resolve any remaining environmental questions.

As you know, Mr. Chairman, one of the ways to try to learn something around here is to try to get below the policy level, to try to get down to people who know something at other levels. What we did was we pulled in on March 3 of this year scientists in the EPA, National Fisheries Service, Bureau of Land Management and USGS because it seemed to me the questions with which we were concerned were fundamentally factual ones, not policy questions, at least not at that time.

I wanted to talk to those who knew far more certainly than I and inevitably far more than those who were their superiors in the agencies. We essentially posed to them three questions. One, what is the composition of drill muds? What do we know about them? Two, to what extent, if any, are they toxic and do they have toxicity to marine organisms and environment in general? Three, what do they know about the effects over time on marine life of these substances, both their lethal effects and sublethal effects? For example, are there chronic behavioral changes over time?

We found some very interesting things, Mr. Chairman. Absolutely none of them coincide with the assurances we had received earlier from the Interior Department at the highest levels.

On the simple question of composition, what is in these substances which we have routinely permitted to be dumped into the ocean and which the Interior Department assures us are safe to be dumped in the Georges Bank. All three agencies, including the Department of the Interior's own scientist, stated that in fact information is withheld, therefore none of the agencies concerned knows the specific composition of the muds.

The question is further complicated by the fact that the chemical properties of these materials change at different temperatures and pressures to which they are subjected in the course of drilling. The only agency of the three before us, EPA, Interior and NOAA, which actually conducts research on the composition of drilling muds is EPA. They were the most adamant of the three concerning the lack of knowledge we have in science with respect to the composition.

With respect to toxicity, the Department of the Interior's two scientists divided. BLM admitted some of the materials were toxic and USGS minimized the toxicity.

Let me give you some idea of the level of scientific assurance we received from USGS. I quote a brief exchange between myself and Mr. Hight from USGS:

Mr. STUDDS. Does your agency do the testing?

Mr. HIGHT. No.

Mr. STUDDS. Yet you are confident of the results?

Mr. HIGHT. I have 30 products that they have that they ran tests on, the mud companies.

Mr. STUDDS. We are relying on their data and their assurances as to whether or not the product is toxic?

Mr. HIGHT. Yes, I assume their data is correct.

The Environmental Protection Agency cited evidence of toxicity, and the scientist from NOAA basically supported EPA while warning of the shortcomings of available research.

All of the agencies, with the exception of USGS—again dividing the Interior witnesses—declared that we simply do not know the long-term sublethal effects because of the lack of reliable research, although some evidence exists of bioaccumulations and behavioral changes. Both NOAA and EPA have minimized studies done in the gulf because of a lack of availability of control areas: in short, the entire gulf is polluted to some extent after three decades of OCS activity. It's almost impossible to find an area not already touched by drilling activities to use as a baseline.

This brought out the fact we have no baseline data from Georges Bank and Beaufort Sea, which is necessary to determine the effects of drilling.

Additionally, EPA and NOAA agreed that shunting would not eliminate the adverse effects of onsite disposal of drills muds, while the Interior witnesses were uncertain.

It seems to me that what we ought to do is to say to the industry, we are mandating all the safeguards that you are capable technologically of undertaking. Then if it turns out to be economically unfeasible to drill, we don't drill.

I would suggest, Mr. Chairman, the Interior Department has turned that process on its head, has looked at a variety of safeguards; concluded, as we were told in an earlier hearing, that it was an expensive process and therefore ought not be mandated. It's the kind of thinking, I think, that is upside down and backwards.

If we are not going to mandate these kinds of maximum safeguards for an area like Georges Bank, I think we are justified in asking ourselves where on the face of the earth are we going to mandate this kind of thing.

I particularly wanted to thank, before they left, the Senators from the two noncoastal States of Kentucky and Nevada for demonstrating what those of us in New England have tried to make a point of for sometime. That is that this is not a parochial issue alone.

The questions at stake are questions of genuine national policy. The question of energy supply for the United States is a national question. I would submit likewise and at least as important, the question of a food supply, of a protein supply for this country and for the people of the world is a national question.

Let me review very quickly. The questions we asked were this. What do we know about the composition of these materials? We don't know very much. We know there are some toxic effects but,

as one scientist said, there are so darn many ingredients in here we don't know which are toxic.

What do we know about the extent of the toxicity? Not much. What do we know about the effects over time, what kinds of long-range studies have been done? The longest range studies done over time we were told are now about 2½ years old, their studies based on the already polluted Gulf of Mexico.

As pointed out before, the highest Federal official with direct responsibilities for the fisheries of the country, the Administrator of NOAA, is on record as opposing this lease sale, while his own record is somewhat circuitous I must agree with Ms. Ross with respect to his position.

His most recent position is in a September 21 letter to James Joseph, Undersecretary of Interior from which I quote. "I'm pleased you have agreed to certain safeguards which will reduce risks to fisheries and other biological resources of Georges Bank posed by oil and gas activities. Your adoption of those safeguards was a fundamental element to withdraw proposal of marine sanctuary covering Georges Bank.

However, because oil and gas exploitation poses risks of substantial environmental damage even with the agreed upon safeguards, I still do not favor leasing the Georges Bank and would prefer lease sale 42 not be held at this time.

That is a letter from Richard Frank, the Administrator of NOAA who, as I say, has as his preeminent responsibility the protection of the fisheries of this Nation.

Senator TSONGAS. I might add that when NOAA testified before the Energy Committee sometime ago, there was a great deal of discussion about the data base available to detect changes in the environment. As was suggested very strongly, this isn't there, in sharp contrast to the Gulf of Mexico where the data base is in place.

Mr. STUDDS. Also critically important, we are continually told by Interior and the oil industry that after two or three decades of experience after drilling in the gulf there has been no observable damage to fisheries in the gulf and they are thriving such as they have before.

What they never tell you is that the index of fisheries effort has increased eightfold while catches remain stable. What that says to me is that we can't prove anything by that.

Senator TSONGAS. Let me correct, in the end I refer to what Mobile put into the Globe. It says fishing is important to Louisiana too, but what has happened to the Gulf of Mexico after decades of oil gas development? Better fishing, say State officials.

It goes on and talks about an appreciation data New Orleans or somebody put on for Mobile.

Mr. STUDDS. Better fishing occurs if you stand on the rig, like any artificial reef it attracts fish. What they don't tell you is if you put an automobile wreck in you will have the same effect. Fish are attracted to any object like that dumped into the ocean. It doesn't affect overall number of fish.

The point in contrast, the principal commercial fisheries of Georges Bank are biologically such that in their larval stage for 3 or 4 or 5 months of the year they are floating on the surface of the

water. As such they are uniquely vulnerable to relatively small amounts of oil pollution.

The principal commercial fisheries of the gulf are shrimp and manhaden. They have no such characteristics in the larval or any other stage so there is a unique vulnerability to the principal commercial stocks of Georges Bank, which is not the case in the Gulf of Mexico and which renders any efforts, it seems to me, to draw comparisons between the experience in the gulf and what we may experience in Georges Bank relatively meaningless.

Before I go into a brief—may I say I began by stating I thought the Coast Guard and Interior witnesses preceding me were better arguments for the bill than any of us could possibly give. The Coast Guard referred to the oil spill cleanup capability. Current figures and they change monthly, I believe you heard him say the equipment functions in 8- to 10-foot seas. I believe he said 20-knot winds this morning. It was higher last month. Usually they go up rather than down over time.

You also heard the contention by the Coast Guard Admiral that the sea conditions in Georges Bank are such that only 10 percent of the time do the waves exceed 8 to 10 feet. This is an observation most usually made from a desk rather than from a small boat on Georges Bank. I have yet to find a fisherman or anyone else who puts much credence in that.

Even if that is true, 10 percent of the time, that is 2½ hours a day or several days a month, or several months a year, whatever it is. Last August in the middle of the summer we had a routine northeastern storm on Georges Bank in which the waves were 20 feet. Should there be a spill in December or January or February or March, there is simply no way on Earth any existing technology can begin to cope with those kinds of conditions.

Furthermore, we discovered in the Coast Guard Subcommittee on the other side this year that when the Coast Guard says their equipment functions in 8 to 10 feet, what they mean is it didn't sink. What the Admiral said, it survived, is the operative word on the part of the Coast Guard.

We conducted a hearing in Corpus Christi last summer as the Campeche spill was approaching the beaches of south Texas. Again when you got below the admiral, to the level of captain who knew something, the figures tended to go down a little lower.

When you pressed the captain and got the admiral to keep quiet long enough for the ocean commander to say something, then we discovered what the admiral really meant was the damn stuff didn't sink when waves got as high as 8 or 10 feet.

Beyond that they can't promise it won't sink. It certainly can't clean up oil. That equipment will last until the first wave hits 10½ feet, this presumably, will be a matter of hours.

Senator TSONGAS. Maybe the regulations could mandate there shall not be a spill unless there is calm water.

Mr. STUDDS. We could do that, or require that observations of wave height be taken from personnel above the rank of captain from their desk.

The nearest cleanup equipment is in Elizabeth City, N.C.

I added funds not requested by the administration, in fact axed by OMB, to put in the blinkety-blank equipment they keep telling us is available. It's not onsite. It's in North Carolina.

Furthermore, the admiral kept telling us about the Clean Atlantic Consortium. To the best of my knowledge, they have no equipment.

Certainly the best equipment we have is that to which the Coast Guard referred which is not there and will sink in waves over 10 feet.

Senator TSONGAS. There was testimony to that effect before in the hearings we had that probably should be included at this point as well. It goes into the numbers, the figures and noncommitment to have that kind of vessel built.

[The statement follows:]

STATEMENT OF DR. DANIEL SCHIFF, P.E., PRESIDENT, RESEARCH CONSULTANTS, INC.

An oil spill off Georges Bank can only be cleaned up if the weather permits and if the proper equipment is available. When wind driven seas exceed six to ten feet, a common condition in the open sea off Georges Bank, the spilled oil will be mixed into the water to depths of twenty to forty feet below the surface. The oil can not be recovered under these conditions. However, when winds and waves subside, the oil will usually return to the surface and recovery, containment and spill control operations can be implemented. It is important that the equipment used in these spill control operations be able to survive seas that far exceed oil spill recovery conditions and that the safety of the spill control crews be assured. Specifically, oil spill recovery ships and other vessels and equipment have to be built that can be safely used in the open ocean. Significant oil spills often last many days or weeks, and recovery equipment that can remain on station during bad weather at sea will be able to start cleanup operations when the oil returns to the surface or when weather conditions permit, eliminating the time required for the equipment to arrive on scene from a more sheltered harbor area.

The largest oil spill recovery vessels built in the United States to date are the "Bay Skimmer" for Gulf Oil's VICC Terminal in Bantry Bay, Ireland and the "Delbay" for the Delaware Bay Cooperative. These vessels, which were designed and built in New England, are seventy feet long, displace 100 long tons, and cost about 1.2 million dollars. The "Bay Skimmer" has been operating successfully as an oil skimmer and as a support vessel for almost three years; the "Delbay" went into service last summer. In Japan, oil spill recovery vessels twice the displacement of the "Delbay" and the "Bay Skimmer", employing the same oil spill recovery concept, are being placed into service. These vessels are large enough to operate in harbors and in some bays, but they would not be safe to use in the open sea off Georges Bank except in very favorable weather. For safe operation off Georges Bank, an oil recovery vessel should displace at least 750 long tons (7½ times the displacement of the "Delbay") with a length of 160 feet. If the spilled oil were on or near the surface of the water, a vessel of this size could recover oil in seas up to eight or ten feet in height. Oil recovery vessels of this displacement are on the drawing boards, and would cost about four million dollars.

There have been many different oil recovery concepts which have been developed over the past decade. They include mops that absorb oil, oleophilic belt conveyors, various arrays of oil absorbing belts and discs, wires, vortex machines, etc. In principle, any of these can be added on or built into an oil recovery vessel. Of the three or four basic concepts that have been widely used, the one that has been most successfully applied in multi-purpose vessels to date is the Dynamic Inclined Plane (DIP) concept. This is the oil spill recovery system used in the "Bay Skimmer", the "Delbay" and the larger Japanese vessels described above. The same system is also used in scores of units and small oil spill recovery boats operated by the U.S. Navy in harbors at Navy facilities in the United States and around the world.

The oil spill recovery vessel should be designed as a multi-purpose ship which can be used to transport personnel and equipment to offshore sites during normal exploration and production operations, or used as a platform for underwater diving operations. It should also be equipped with fire monitors for fire fighting purposes. This multi-purpose vessel design will allow the major part of its cost to be allocated to normal operations while providing a potent oil recovery capability in spill emer-

gencies. The add-on of oil recovery systems to "vessels of opportunity" not designed for the purpose has been attempted a number of times but has not proven to be effective. If add-ons are permanent, they take up considerable deck space rather than being fitted into the hull as in a ship that has been designed as an oil recovery vessel. The result is to render the vessel of opportunity much less effective for its original mission. If add-ons are only used during an oil spill emergency, experience has shown that it takes days or weeks to bring the oil recovery add-on equipment and the vessel to the same location and install the equipment on the vessel. The major problem experienced in using vessels of opportunity in the Bay of Campeche (Mexico) oil spill was in overheating the ship's main propulsion engines due to the oil ingested into the sea water cooling system. The oil in the heat exchanger reduces the heat transfer below required levels, requiring the ship to seek oil free water and interfering with normal engine operation. Vessels that are properly designed for oil recovery operations circumvent this problem by using external keel coolers that are designed with a large enough surface area to accommodate the requirements of a closed loop cooling system.

Oil spill recovery vessels are only one part of an oil spill control system. The oil recovery vessels have a limited capacity for carrying oil, and oil barges are required to transport the oil from the recovery vessels to holding tanks or disposal areas on shore. These barges will periodically receive oil from the oil recovery vessels by means of pumps and hoses on the recovery vessel, and discharge them into shore based receiving stations. There must be adequate capacity on shore to receive the mixture of oil, seawater and debris brought in by the barges from the scene of the recovery operation. If the oil-water mixture allows separation and economic recovery of the oil, the mixture should be sent to an oil-water separation facility, or temporarily stored in a holding tank for later separation. If the oil is not economically recoverable from the mixture, the mixture should be sent to a properly designed disposal facility. Another important part of the oil spill control system is the oil boom which may be required to contain the oil in a designated area, divert the oil from the most sensitive areas, or funnel the oil into the path of an oil recovery vessel. However, even the largest and most advanced oil booms available today may not be effective under sea conditions commonly found at Georges Bank. Booms may only be able to be used near shore where wave height is often less and where the shore needs protection.

Another element in the oil spill control system is dispersants, if their use is allowed. Dispersants have been more widely used in Europe than in the United States. They may be used in some oil spill situations if the environmental impacts are judged to be acceptable. They cost between \$0.50 to \$1.00 per gallon of oil spilled, and none of the dispersed oil is economically recoverable. In a large spill, transport of the required quantities of dispersants and even spreading over the spilled oil would represent a major problem. Some air-deployable systems are available, but they are limited in size and capacity. Deployment by ship would require the vessel to operate in the spilled oil and would lead to overheating of the ship's engines as described above. If dispersants are to be used, there must be large supplies maintained at shore stations and the means must be available to transport and spread them at the spill.

In addition to the major equipment described above, a complete oil spill control system will require land, air and water transportation for personnel and equipment, and adequate communications to direct and coordinate all activities.

In summary, the requirements to clean up an oil spill off Georges Bank are as follows:

- Several (perhaps four) multi-purpose oil recovery ships large enough to provide crew safety in bad weather and to allow oil recovery when the oil is on the surface;

- Oil barges large enough to withstand weather conditions and with enough capacity to allow the recovery vessels to operate continuously and transport all the recovered material to shore;

- Shore facilities, including holding tanks and disposal areas with sufficient capacity to accommodate all recovered material brought in by the barges;

- Large oil containment booms, with a total length of perhaps ten or twenty miles, which are effective in typical seas in the Georges Bank area;

- Large supplies of dispersants (if allowed) with appropriate delivery equipment;
- Transport and communications equipment.

Most of the above requirements are within today's state of the art, with the exception of the large booms for use in Georges Bank sea conditions. Few of these requirements are met by the equipment and facilities actually in existence today, or by any well defined plans. There are no oil recovery vessels or booms on order which could operate safely or effectively in the Georges Bank area under normally

prevailing sea conditions. It is unlikely that adequate barge transportation could be made available when needed. And there is likely not enough holding tank or disposal area capacity to handle a large spill even if the oil-water-debris mixture could be picked up and transported to shore.

Mr. STUDDS. Ms. Ross from Interior kept assuring us about how reassured we ought to be on the existence of the biological task force. While all of us in New England welcome the creation of the task force as a step toward recognition of environmental concerns not adequately addressed, the fact is of the five members, three work for the Department of the Interior, Fish and Wildlife, BLM, and USGS; so where we find a matter of controversy on which EPA and NOAA would say wait a minute, the fact is I think we have to be more naive than most people in the room to think the three representatives of the Interior will go contrary to the Secretary for whom they work.

That is a mechanism far from something by which we can get around or repeal or somehow evade or change what we consider to be an erroneous judgment on the part of the Secretary. It's a body which is beholden to him and a majority of whose component members in fact work for him.

So, it's not something I think we can look to for enormous controversy with respect to findings of the Secretary.

Finally, may I say, Mr. Chairman, that—

Senator TSONGAS. Let me just add, one of the issues that came up during the Faneuil Hall hearings was the notion of having somebody on the task force who was not tied to one agency or another. Some outside individual consultant.

Do you subscribe to that notion?

Mr. STUDDS. I think I find that a little more comforting than what we have at the moment, although I must say to you, I think obviously the reason I'm here is that I think we have to mandate these things for a variety of reasons not the least of which is your own rather frightening observation about the possible outcome of the election this fall. We need to bear that in mind in all of our legislation here.

There are arguments about so and so is an awfully nice person, the current secretary of something or another. It isn't going to be that way indefinitely, whatever happens this fall. I think we ought not make public policy on anything, so tenuous but it's unlikely the committee will last forever.

As you well know, we began by trying to persuade the administration voluntarily to mandate these safeguards. We then tried to embarrass them into it by a series of hearings showing as I indicated that the policymakers are not making their statements based on the evidence that their own scientists would give them if they bothered to ask them.

Finally, having despaired of convincing or embarrassing the administration, you're attempting through legislation to mandate what I think is simply commonsense. The balance of food versus oil, the so-called effort to balance the economy, environment. As you well know in most regions of this country, if you look beyond 2 inches of your noses, the economy is the environment and vice versa.

I would like to close by thanking you, and Senator Weicker is also coauthor of the bill; and particularly, as I say, the Senators from the noncoastal States for demonstrating the sense that this is a genuine national question and not simply one of concern to New England.

Senator TSONGAS. Since you don't want to do it, I'm going to read from your statement.

In 1961 President Kennedy stated:

It's our task in our time and generation to hand down undiminished to those that come after us as was handed down to us by those who went before, the natural wealth and bounty which is ours.

This is not your statement.

This is now your statement:

I do not feel our children or their children should have to speak of the great Georges Bank fisheries or breathtaking beauty of our shorelines in the same nostalgic tones used today with respect to the American buffalo or the former quality of our rivers and streams.

I think that is very well stated. I either commend you or your staff.

Mr. STUDDS. You know how much less well staffed we are in the House; in numbers, not in quality.

Senator TSONGAS. Senator Weicker?

Senator WEICKER. I have no questions.

Senator TSONGAS. Gerry, let me say that I will commend you, one, because I knew nothing about this issue when I represented Merrimack River, it was only of peripheral concern. You have done a lot to educate the delegation, and I think beyond what you have done for your own district has been important to us who are nevertheless sensitive to it and less knowledgeable.

Since my in-laws are your constituents, I'll pass that on to them.

Mr. STUDDS. Thank you very much. I even learned where the Merrimack River is, since you were elevated.

[The statement follows:]

STATEMENT OF HON. GERRY E. STUDDS, U.S. REPRESENTATIVE FROM
MASSACHUSETTS

I want to express my appreciation to the Chairman and committee members for the opportunity to offer testimony on behalf of S. 2119, the Georges Bank Protection Act.

My involvement in the process of oil and gas lease sales, exploration, and development on the North Atlantic Outer Continental Shelf, and more particularly on Georges Bank, is a long and continuing one. I will spare the Committee a detailed history of my relationship with the Department of the Interior on this matter and, instead, move quickly through a general overview and an explanation regarding my own interest in this legislation.

As this committee knows, several significant pieces of legislation have been enacted in recent years to provide protection for our marine environment. These protections are largely embodied in the Outer Continental Shelf Lands Act Amendments of 1978, the Coastal Zone Management Act, the Clean Water Act, the Marine Protection, Research and Sanctuaries Act of 1972, and the Fisheries Conservation and Management Act of 1976.

One would logically conclude that this portfolio of recent protective legislation would be a clear indicator to relevant agencies that it is the intent of the Congress to protect sensitive ocean areas such as Georges Bank.

We have worked with the Department of the Interior on this issue since tracts for Lease Sale 42 were first proposed in early 1976. No one is more painfully aware of the nation's need for energy resources and of our obligation to assist wherever possible in providing those resources than the people of New England. For this

reason, I have never stated that oil and gas activity should be excluded entirely from Georges Bank. However, I have consistently maintained that no oil and gas activity should take place on Georges Bank until all possible safeguards have been put into place. In stark economic terms, it makes little sense to jeopardize a perpetually renewable resource for what the U.S. Geological Survey (USGS) has estimated to be less than seven days worth of oil at present U.S. consumption levels.

It must be acknowledged that the Department of the Interior has made improvements in its original proposed notice of sale and lease stipulations. It has deleted certain tracts in sensitive areas such as lobster canyons, required on-site location of oil pollution control equipment, and created a Biological Task Force to oversee oil and gas activity in that area. However, serious weaknesses remain in the protection provided thus far. The shortcomings are so severe that the Administrator of National Oceanic and Atmospheric Administration (NOAA) urged that the lease sale not be held at all. These weaknesses lie primarily with the disposal of materials used in, or incidental to, offshore drilling. Those materials are drill muds, drill cuttings, and formation waters.

Drill muds are mixtures of clays, diverse chemicals, and water which are used as lubricants during oil and gas operations. These muds, which vary greatly in composition depending upon the specific requirements of an individual well, are also pumped into the oil wells to reinforce the walls of the drilled hole, weight the drilling column to help prevent blowouts, and transport cuttings to the surface.

Drill cuttings are those pieces of the seabed and subsurface rock which are displaced or impacted by the drilling process.

Formation waters are the waters found in off-shore oil and gas reservoirs which contain petroleum, dissolved mineral salts, and traces of heavy metals. These waters are generally separated from the oil and gas at the surface and simply returned to the water column from the oil rig.

All of these materials contain substances which could have a potentially detrimental effect on the biological resources in proximity to drilling operations.

Before the House Select Committee on the Outer Continental Shelf in December of last year, Deputy Assistant Secretary of the Interior Heather Ross assured the committee that Interior's plan for disposal of these materials was environmentally sound.

We were assured that the precise composition of the muds was not proprietary information, that the Department of the Interior knew the composition, and that they possessed "a shelf full of studies and reports on this topic," none of which indicated any significant adverse long or short term environmental effects.

She also indicated that the Department's decision not to require barging of muds was based upon cost and upon the hazards posed by meteorological conditions during certain periods on Georges Bank. She admitted that the cost estimates were provided by the industry.

Secretary of the Interior Cecil Andrus also appeared before the committee on February 6, 1980 to basically reiterate the testimony of Ms. Ross. He stated that the compositions of drill muds were proprietary but that they were available to the Department.

He further indicated that muds and formation waters could be shunted below the surface with no adverse environmental effects. Much of the testimony ran counter to what I had learned from the scientific community and the material I had encountered in my own reading.

Therefore, on March 3, 1980 I convened a hearing in the House Subcommittee on Oceanography, which I chair. I specifically requested the appearance of scientists from each of the agencies charged with environmental responsibilities on the OCS (Interior, NOAA and EPA).

The purpose of the hearing was to determine the state of our knowledge regarding the long and short term effects of these materials on the environment. What ensued was most enlightening.

Basically, I posed three questions:

1. What is the composition of these materials?
2. What is their degree of toxicity?
3. What are their long and short term effects?

Although the hearing was called to examine all three materials, most of the conversation centered on drill muds.

On the question of composition, all three agencies (including the Department of the Interior) stated that, in fact, precise information is withheld by the mud producers, and, therefore, none of the agencies knows the specific composition of the muds. The issue is further complicated by the fact that the properties of these materials change under different temperatures and pressures.

The only agency of the three which conducts research on composition is EPA and they were the most adamant about our lack of knowledge.

With regard to toxicity, the Department of the Interior was divided. Bureau of Land Management admitted some of the materials are toxic, while USGS minimized toxicity. This was, in turn, qualified by the following exchange:

Mr. STUDDS. Does your agency do the testing?

Mr. HIGHT. (USGS). No.

Mr. STUDDS. Yet you are confident of the results?

Mr. HIGHT. I have 30 products that they have that they ran tests on, the mud companies.

Mr. STUDDS. We are relying on their data and their assurances as to whether or not the product is toxic?

Mr. HIGHT. Yes, I assume their data is correct.

The Environmental Protection Agency cited evidence of toxicity, and the scientist from NOAA basically supported EPA while warning of the shortcomings of available research.

All of the agencies, with the exception of USGS (again dividing the Interior witnesses) declared that we simply do not know the long term sub-lethal effects because of the lack of reliable research, although some evidence exists of bio-accumulations and behavioral changes. Both NOAA and EPA have minimized studies done in the Gulf because of a lack of availability of control areas: in short, the entire Gulf is polluted to some extent after three decades of OCS activity.

Also surfacing during the questioning was the current lack of baseline data for frontier areas such as Georges Bank and the Beaufort Sea which is necessary to determine the effects of drilling.

Additionally, EPA and NOAA agreed that shunting would not eliminate the adverse effects of on-site disposal of drill muds, while the Interior witnesses were uncertain.

Mr. Chairman, based upon this hearing, I think it is abundantly clear that a substantial risk is being imposed upon the fisheries of Georges Bank, not just from the effects we know, but from those we do not know. I think it is unconscionable that the Department of the Interior would refuse to require a safeguard because of economic infeasibility based upon industry cost figures. In this regard, I was even more puzzled to learn from my colleague, Congressman Emery of Maine, that he had been told by representatives of the industry that the cost of barging drill muds and cuttings would not be prohibitive.

When the maintenance of fisheries as rich as those found on Georges Bank are at stake, the costs of safeguards should be factored into the costs of production. If, thereafter, a particular tract is not economically feasible, we do *not* eliminate the safeguard; we simply do not drill.

If we are not going to mandate safeguards for one of the richest fishing grounds on earth, where will we mandate them? What is the utility of all the marine environmental legislation which this body has labored so strenuously to enact in recent years if we are willing to suspend our concern for seven days of oil consumption?

In December of last year 50 of my colleagues in the House joined me in requesting the President to mandate the provisions now contained in S. 2119. I wholeheartedly support that bill.

In 1961, President Kennedy stated: "It is our task in our time and in our generation to hand down undiminished to those who come after us, as was handed down to us by those who went before, the natural wealth and beauty which is ours." I do not feel that our children or their children should have to speak of the great Georges Bank fisheries or the breathtaking beauty of our shorelines in the same nostalgic tones used today with respect to the American buffalo or the former qualities of our rivers and streams.

It is for this reason that we have all labored for proper protection of the OCS and it is for this reason that I seek your expeditious and favorable consideration of S. 2119.

Senator TSONGAS. We will now have the panel concerning drill effluents. Mr. Sneed of Mobil and Ken Biglane will be the EPA representative.

STATEMENTS OF KENNETH E. BIGLANE, DIRECTOR OF THE DIVISION OF OIL AND SPECIAL MATERIALS CONTROL, ENVIRONMENTAL PROTECTION AGENCY; ACCOMPANIED BY DR. SUZANNE BOLTON, OCEAN PROGRAMS BRANCH; AND J. M. SNEED, MOBIL OIL CO.

Mr. SNEED. Thank you, Mr. Chairman.

Senator TSONGAS. We have three panels, and we are supposed to be out of here by 12. We are clearly not going to do that. We will limit it to 20 minutes a panel which will take us to 12:20, so that the third panel doesn't get completely obliterated in discussions.

Mr. Biglane, if the witnesses could have their statements inserted in the record and summarize, it would be reasonably fair to those at the bottom of the witness list.

Mr. BIGLANE. Mr. Chairman, I am Kenneth Biglane, Director of the Division of Oil and Special Materials Control for EPA. Unfortunately, Mr. Longest who was scheduled to be here, was unable to attend the meeting and asked that I sit in for him. Accompanying me is Dr. Suzanne Bolton, marine biologist with our Ocean Programs Branch.

Before turning to discussions of our programs, I would like to make these points. First, EPA believes that the resources on the Outer Shelf can be extracted consistent with sound protection of the marine environment.

Senator TSONGAS. Let me interrupt, Senator. We may inquire as we go along, so feel free.

Mr. BIGLANE. Second, we believe the regulatory programs are in place now to accomplish this. EPA's regulatory authorities for waste disposal related to OCS drilling and production operations are intended to minimize the adverse impacts of industrial activities on the environment. Discharges into ocean waters are regulated under section 402 of the Clean Water Act through issuance of a national pollutant discharge elimination system—NPDES—permit. Disposal of waste materials through dumping into ocean waters is regulated under the Marine Protection, Research, and Sanctuaries Act—MPRSA—by the issuance of ocean dumping permits. These two statutes are intended to operate as a comprehensive, integrated, consistent regulatory framework for the control of ocean pollution.

Under the Clean Water Act, EPA has established effluent guidelines which are technology based standards that form the basis for discharge limitations contained in NPDES permits for a number of classes of industrial activities. The oil and gas extraction industry is one "class" of industry for which discharge limitations have been established. Regulated discharges from OCS drilling and production platforms include drilling fluids, the chemicals used during drilling operations, process waters, formation waters produced during oil and gas separation, and sanitary wastes, deck drainage, cooling water, et cetera.

In most instances, standards established under the effluent guidelines may be adequate to handle the discharge concerns. However, where OCS exploration and production takes place near potentially sensitive, biologically unique, or commercially important environments, the effluent guidelines may not necessarily provide adequate protection.

Therefore, an analysis of the potential effects of the discharged material and an estimate of the exposure that organisms in the ecosystem are likely to receive as a result of exposure in the field may require more restrictive permit conditions. Clearly such decisions must be based on a case-by-case analysis of special environmental concerns about the potential effect of a particular discharge into a specific ecosystem.

The requirement for individual analyses of discharges into marine waters is contained in section 403(c)——

Senator TSONGAS. Let me interrupt you. Is that discretionary, those criteria?

Mr. BIGLANE. When—they are discretionary only to the extent they are applied on a case-by-case basis. Let me give you an example. We have established under the effluent guidelines standards for drilling fluids, deck drainages and formation waters. These standards are now being applied in Baltimore Canyon. They are applied under the criteria set forth in our regulations.

However, as I stated, in areas like the Flower Garden Reef and on Georges Bank, we would look forward to applying stricter conditions under 403(c) than are generally outlined in the effluent guidelines standards.

Senator TSONGAS. Upon the decision of whom?

Mr. BIGLANE. It would be the regional administrator of EPA.

Senator TSONGAS. But it is administration policy, in effect?

Mr. BIGLANE. The guidelines allow that, yes, sir.

Senator TSONGAS. I guess that is what I am trying to get to. If the Administration should change its mind, or we should change administrations, those assurances are then defunct?

Mr. BIGLANE. I don't know an example of which you speak.

Senator TSONGAS. Well, if standards are discretionary, then they clearly are at the discretion of the Chief Executive. And if he should have a change of heart on a particular issue, or, indeed, if you change Chief Executives, then those standards in that case become theoretical.

Mr. BIGLANE. Well, these are minimum standards under effluent guidelines. Then you go from there.

Senator TSONGAS. That's right.

Mr. BIGLANE. So from where I sit, going from there means more strict standards, that is, they can be made more stringent under section 403(c) as specific environmental conditions might warrant.

Senator TSONGAS. From where I sit, too.

Mr. BIGLANE. I don't want to leave if you are uncomfortable with my answer.

Senator TSONGAS. No, I am quite comfortable with your answer.

Mr. BIGLANE. As I stated, the Flower Garden Banks off the coast of Texas is an example of a situation in which special permit requirements are under consideration because of the particular sensitivity of the area where drilling is to occur. The Flower Gardens encompass an area of ecologically vulnerable coral and other biologically valuable formations. EPA is now in the process of considering special permit conditions relating to discharges. As proposed, the permits contain a provision that prohibits bulk discharge of drill fluids from rigs and platforms near the sensitive reef communities.

This recommendation is under consideration because EPA believes that substances routinely discharged in the drilling process, in many cases, have not been sufficiently evaluated for toxic effects. From recent studies, EPA is concerned that certain chemicals, previously evaluated as producing no apparent effect may, in fact, have toxic effects in the marine environment.

In particular, there is insufficient research to assess properly low-level and other chronic effects of drilling fluids. For these reasons, EPA has determined that in sensitive areas, drilling operations must be carefully controlled to minimize the potential for harm from discharges.

A requirement prohibiting or limiting discharge of material into a specified area means oil companies will have to evaluate several disposal alternatives. Decisions as to which alternative is most appropriate will be made by each company on an individual basis and will depend for the most part on economic considerations.

The more obvious alternatives are: One, to collect and transport for reuse; two, to transport for shore disposal; three, to transport for ocean disposal; and four, to transport discharged materials through pipe to an area outside the restricted zone or reinject them into underlying formations. A number of these alternatives are now either being used or are planned for use as economically viable disposal mechanisms.

Senator TSONGAS. Let me ask you to go back. You say the decision as to which alternative is most appropriate will be made by each company and will depend for the most part on economic considerations. Now, the drilling and production of Georges Bank will take place under decontrol; is that correct?

Mr. BIGLANE. Yes, sir.

Senator TSONGAS. So, in other words, the price to be secured for that oil will be the world price less the windfall profits tax?

Mr. BIGLANE. I don't know what you mean. The price of the—

Senator TSONGAS. Under decontrol the price of oil rises to the world price, does it not?

Mr. BIGLANE. Yes, I am told that is true.

Senator TSONGAS. And so the economic consideration is not a function of cost of drilling because obviously the world price will be higher than what it costs to bring this oil on line. The issue will be one of the differences between a world price and in essence the profit margin will be affected, not the viability of production.

Mr. BIGLANE. That's right.

Senator TSONGAS. I guess under those circumstances, since the Government is going to take away the windfall profits, why economic considerations that go to the production and not economic considerations that go to fishing, for example, would be the mandated criteria?

Mr. BIGLANE. The companies must provide analyses of these alternatives for waste disposal. The requirement is in the ocean discharge criteria language which becomes part of the permits. The applicant is required to do a number of things: Provide analysis of the alternatives which I just stated; a description of the process contributing to the discharge; pollution control technologies and practices currently in use—deep-well injection, incineration, land

application; an analysis of relative environmental risks and impacts in each land-based alternative.

There is a series, Mr. Chairman, of—

Senator TSONGAS. That is based on what assumption about the toxic nature of the muds?

Mr. BIGLANE. That assumption is dependent upon the bioassay of the specific muds and an analysis of the characteristics of the receiving environment.

Senator TSONGAS. I am taking up too much time. Why don't you continue?

Mr. BIGLANE. For example, a Department of the Interior requirement for no discharge of drilling material was imposed in the Tanner Banks area in California. In this case the companies involved decided that ocean disposal would be the best alternative and requested EPA to issue an ocean dumping permit. EPA will complete the environmental analysis for designation of an appropriate ocean dumping site in the near future, and the necessary ocean dumping permits will then be issued.

In a similar situation, under a State-imposed permit restriction requiring no discharge off the west coast of Florida, a request for an ocean dumping permit to dispose of drilling materials is now pending before EPA from companies who will be operating in that area.

In another case, off of the California coast, the alternative of piping production waters into underlying formations, and to treatment and disposal facilities on shore, is being utilized to meet permit requirements.

I would like at this point to give the committees a brief summary of the status of EPA's efforts, under our regulatory and research programs, as they relate to oil and gas development in the Georges Bank.

Our region I office in Boston has begun the process necessary for the issuance of NPDES permits for those tracts recently leased in the Georges Bank area. The regional office recently met with representatives of the oil companies who will be operating on the leased tracts. The purpose of the meeting was to explain the permit process and review the requirements of a draft permit application. Information contained in the application will become part of the data which the region will evaluate in reaching decisions as to whether special permit conditions will be imposed.

It is anticipated that a few applications for exploratory drilling may be received within the next 2 to 3 months. Permit issuance would occur as soon as possible after receipt of a completed application.

EPA has ongoing research and monitoring programs designed to fill these regulatory needs, including the development of a marine toxicology expertise to identify drilling-related impacts. Environmental concerns being addressed include the effects of chemicals discharged during oil and gas drilling activities that originate from: (a) "drilling fluids" or "drilling muds"—chemicals added to the well-bore; and, (b) "cuttings"—formation solids that become coated with the drilling fluid in which they are suspended. Both mixtures of chemicals are normally discharged into the marine environment during exploratory and developmental drillings.

EPA's hazard assessment of oil and gas drilling and production-related activities is managed by the Office of Research and Development's Environmental Research Laboratory at Gulf Breeze, Fla. The program is in the fourth year; the part specifically devoted to Georges Bank is now in the second year. That portion of the program dealing with the Georges Bank emphasizes potential risks to commercially important fisheries.

The specific program objectives are concerned with the development of information on what, if any, adverse environmental effects could occur from discharges during drilling and production activities. Some specific objectives of the EPA research and monitoring program that are related to the Georges Bank ecosystem are:

One, assess the effects of discharged chemicals on commercially important bottom feeding fish and shellfish. Organisms under study include the lobster, scallop, hake, and flounder.

Two, assess the effects of discharged chemicals on physical and biological processes. These studies include evaluation of potential effects on sediment stability, ability of young organisms to develop normally, population structure, marine ecosystem diversity, productivity, and growth rates.

Three, determine the persistence of and potential for concentration of discharged pollutants. This research emphasizes the fate of chemicals in the environment, including the ability or inability of chemicals to concentrate in organisms consumed by man.

Four, develop methods appropriate for a biological and chemical monitoring scheme. The purpose of this research is to prepare a cost-effective and timely tiered system of testing to assess the fate and effects of drilling discharges on marine organisms from active drilling sites.

Senator TSONGAS. Is it absurd to wonder why we don't have that information in place before we go ahead?

Mr. BIGLANE. It is the normal process, Mr. Chairman, to issue NPDES permits based on existing information. EPA became quite concerned in this area several years ago; that is the reason we have the program. From my own perspective, I would expect that as results from this research become available, those results are made available to the regional administrator for any amendments perhaps to the NPDES permits.

Senator TSONGAS. When will that, when will these studies be completed?

Mr. BIGLANE. Dr. Bolton?

Dr. BOLTON. The studies are operating at different rates. There is information coming in constantly, but all of it has not entered peer review literature yet. I just received two papers yesterday, but they are in draft form.

Senator TSONGAS. If I simply reiterated what was just stated as to the objectives of the study and said OK, this is what you wanted to find out. Now you have found it out. What are those findings? What would you be able to answer to that question?

Dr. BOLTON. I think I would have to repeat what Mr. Biglane said, that we would provide the information as it becomes available. As far as a specific date when data is going to be available, I can't give you that. It depends on the progress of the research that is ongoing. There were papers presented down at the Drilling

Fluids Symposium in Orlando, Fla., which deal specifically with the Georges Bank area. I am sure that that material will be in peer review literature in short order.

But as far as all of the work that is going on under EPA auspices, I can't give you a specific completion date.

Senator TSONGAS. Can you give me a ballpark? Clearly, you know, that is a very good answer in the sense that you know it fends off the point. But in terms of the capacity of the Congress to make a decision which is based on the question of when will we know enough that we can assess realistically the potential damage, and that is what you people are hired to do, that is why EPA exists.

So the question is, when will we know enough to make a valid decision, and the answer is, well, things are coming in all the time. There is something basically wrong with the structure we have here. I don't mean to be pointed. Obviously these things are important.

Dr. BOLTON. I understand that and I have to form my decisions on the same data.

Senator TSONGAS. They are going to be around for a long time, hopefully, the fishing industry in our State. If I can't get an answer from EPA, who am I going to go to to get a feel for when the data is adequate? Who do I talk to?

Mr. BIGLANE. All I can say, Mr. Chairman, is that this program became of concern to EPA. EPA, as I understand it, is one of the few, if not the only Federal agency, looking into these matters for this specific instance. We assure you we will get the answers to you just as soon as they are available, and to those who can use the information.

Senator TSONGAS. You are not the people I should be browbeating on this, clearly. But you are the ones up at the plate. I hope you can take the message back.

Mr. BIGLANE. Yes, sir. May I continue?

Senator WEICKER. Let me pose a question here. As I understand it, both EPA and NOAA were initially opposed to the leasing; is that correct?

Mr. BIGLANE. Speaking for EPA, we had some reservations in the regional environmental impact statement.

Senator WEICKER. Right.

Mr. BIGLANE. And did identify certain areas we thought should be withheld from production.

Senator WEICKER. Now, something caused the change in position. When I hear the testimony that is being given this morning, I can only assume that what changed people's positions had nothing to do with science, but possibly had a great deal to do with economics. Would you categorize that as a fair statement?

Mr. BIGLANE. No, sir; I don't know that I can speak to that as a fair statement.

Senator WEICKER. I gather from the answers being given to Senator Tsongas here this morning, that scientific data is still being collected.

Mr. BIGLANE. Yes, sir.

Senator WEICKER. Certainly, there was no assurance given based on scientific evidence that would have dispelled the doubts that EPA initially had.

Mr. BIGLANE. Well, the decision had been made to go ahead with the development of the Georges Bank, and EPA is insisting on this kind of research to answer questions to insure that the NPDES permit be as environmentally strict as necessary.

Senator WEICKER. Is it your position, then, that we gave our approval in the hopes that the scientific answers would come in. Is that your hope, that you would have the answers before the first bit went into the ocean floor?

Mr. BIGLANE. We would hope to have that information. I could not guarantee that.

Senator WEICKER. All right. The question I would then ask is, if you don't have those answers, do you think it would be fair to insist that nothing take place in the way of oil development prior to getting the answers?

Mr. BIGLANE. I think the decision has been made to go ahead with the development on the Georges Bank.

Concerns have been raised about the drilling fluids. EPA has embarked upon a program to research the toxicities that may be associated with these drilling fluids.

And as that data becomes available, we will plug it into the decisionmaking.

Senator WEICKER. But then the question arises, what if you don't have those answers in time to prove one way or another that oil development on Georges Bank can be damaging to the fish life in the area?

Then what do you say?

Mr. BIGLANE. We would hope that the various task forces that have been fashioned would overview this area.

By the way, EPA is chairman of the committee on monitoring of this task force. As information becomes available that suggests damage is being done, then I would think that we would go right ahead with amending whatever permits need amending if that was necessary.

Senator WEICKER. Well, I just think we have got this thing backwards—at least as far as EPA is concerned.

Just as Senator Tsongas points out, this was the environmental agency. I think many of us were clearly in favor of the establishment of EPA because it gave a focal point to environmental concerns.

Many of us felt that by many different groups raising concerns with nobody able to resolve them, impeded normal and logical progress to any endeavors, be they on land or sea.

Now, we have established EPA and in my opinion we still don't have the answers required before activity commences. That is what I think worries us.

I think it's fair to say that we did expect that much. In the absence of proper answers, I just don't think oil development should commence.

Now, the difficulty here is that we don't have the scientific results prior to any activity in sale lease No. 42. There is a possibility that we will even move ahead with lease sale No. 52, before we

have any results, either from the scientific evaluation or from the actual experience of No. 42.

We have absolutely nothing in terms of an EPA evaluation as to what can happen in the event of a spill such as Campeche. That obviously is just now in a position to be scientifically evaluated.

You know, I realize this country is pell-mell bent on getting oil wherever it can find it, but it would seem to me that a very calculated risk is being taken here, and should it prove to be faulty, the price paid would be just enormous.

I know it's hard, considering the temper of the Nation, I am sure that the President made a calculated gamble when, after the first takeover of the U.S. Embassy in Iran and the capturing of our personnel, he decided to keep it open in order that we could have Iranian oil.

That was a calculated gamble. He lost. We are paying a fearful price for it right now.

For the same reason, a gamble is being taken right now on Georges Bank.

I might add the same gamble was taken when the President met with President Portillo of Mexico. His philosophy being—I won't offend him. I won't ask whether the Campeche well is capped. I won't ask him what the damage has been for fear of offending him for fear of not getting Mexican oil.

Well, yesterday, after 6 months, the deed was finally completed. This, after the American people were assured as having been completed months earlier.

Again, all for oil. Somewhere along the line, I expect Interior to be out there pleading the case of the oil companies, and drilling, whatever it is.

The administration can do its thing because it will be held politically accountable. But you and your agency are supposed to be above all this.

You are supposed to at least have the scientific input here regardless of the politics, regardless of the economics, regardless of the need for energy.

I think that at least speaking for myself, the concern is that you have been thrown in the same pot with all these other elements.

That is not your concern. Speak for what it is that you are charged with speaking for, and that is the environment.

Forget the oil. Forget the politics. Forget the economics. The environment is your concern. You are telling me that in that sense, there are no answers.yet.

Mr. BIGLANE. No, sir, what I am suggesting, I think EPA has a pretty good record in most of the things you have covered there.

Senator WEICKER. But you don't have the answers, do you, on this particular problem? Have you got the answers?

Mr. BIGLANE. The answers are coming in, Senator. Just as soon as they are available, they will be used.

Senator WEICKER. Well, fair enough. But the decision has been made without your conclusions. Only with your hopes, but not your conclusions. Right?

Mr. BIGLANE. I want to assure you that all of the authorities that we have to control harmful waste disposal that would impact the environment in that area, we would use.

May I finish, Mr. Chairman? I think we have covered the research, perhaps not well enough. I want to thank you for giving me the opportunity to advise the committee of EPA's regulatory authorities in supporting research with respect to oil and gas development the OCS.

I hope this discussion has been helpful in clarifying why we believe existing regulatory programs are not only adequate to provide protection for the important fisheries resources on the Georges Bank, but also provide an important and necessary administrative flexibility to respond to our understanding of emerging scientific and site specific data.

This ends my prepared statement. I will be happy to answer any questions the members may have at this time.

[The statement follows:]

STATEMENT OF KENNETH E. BIGLANE, DIRECTOR, OIL AND SPECIAL MATERIALS CONTROL DIVISION, ENVIRONMENTAL PROTECTION AGENCY

Good morning, Mr. Chairman and Members of the Committees. I am pleased to be here to discuss the responsibilities of the Environmental Protection Agency to regulate discharges into ocean waters resulting from offshore oil and gas development. Accompanying me today is Dr. Suzanne Bolton, a marine biologist with our Ocean Programs Branch.

Before turning to the discussion of our programs, I would like to make two points: First, EPA believes that the oil and gas resources on the Outer Continental Shelf (OCS) can be extracted consistent with sound protection of the marine environment. And, second, we believe that the regulatory programs are in place now to accomplish this.

EPA's regulatory authorities for waste disposal related to OCS drilling and production operations are intended to minimize the adverse impacts of industrial activities on the environment. Discharges into ocean waters are regulated under section 402 of the Clean Water Act through issuance of a National Pollutant Discharge Elimination System (NPDES) permit. Disposal of waste materials through dumping into ocean waters is regulated under the Marine Protection, Research, and Sanctuaries Act (MPRSA) by the issuance of Ocean Dumping Permits. These two statutes are intended to operate as a comprehensive, integrated, consistent regulatory framework for the control of ocean pollution.

Under the Clean Water Act, EPA has established Effluent Guidelines which are technology based standards that form the basis for discharge limitations contained in NPDES permits for a number of classes of industrial activities. The oil and gas extraction industry is one "class" of industry for which discharge limitations have been established. Regulated discharges from OCS drilling and production platforms include drilling fluids (the chemicals used during drilling operations), process waters (formation waters produced during oil and gas separation), and sanitary wastes, deck drainage, cooling water, etc.

In most instances, standards established under the Effluent Guidelines may be adequate to handle the discharge concerns. However, where OCS exploration and production takes place near potentially sensitive, biologically unique, or commercially important environments, the Effluent Guidelines may not necessarily provide adequate protection. Therefore, an analysis of the potential effects of the discharged material and an estimate of the exposure that organisms in the ecosystem are likely to receive as a result of exposure in the field may require more restrictive permit conditions. Clearly such decisions must be based on a case-by-case analysis of special environmental concerns about the potential effect of a particular discharge into a specific ecosystem.

The requirement for individual analyses of discharges into marine waters is contained in section 403(c) of the Clean Water Act, as amended. The Agency has recently proposed a set of "Ocean Discharge Criteria" under this section which will be used in the future as the basis for issuing NPDES permits under section 402 of the Clean Water Act.

The Flower Garden Banks off the Coast of Louisiana is an example of a situation in which special permit requirements are under consideration because of the particular sensitivity of the area where drilling is to occur. The Flower Gardens encompass an area of ecologically vulnerable coral and other biologically valuable forma-

tions. EPA is now in the process of considering special permit conditions relating to discharges. As proposed, the permits contain a provision that prohibits bulk discharge of drill fluids from rigs and platforms near the sensitive reef communities.

This recommendation is under consideration because EPA believes that substances routinely discharged in the drilling process, in many cases, have not been sufficiently evaluated for toxic effects. From recent studies, EPA is concerned that certain chemicals, previously evaluated as producing "no apparent effect" may, in fact, have toxic effects in the marine environment. In particular, there is insufficient research to assess properly low-level and other chronic effects of drilling fluids. For these reasons, EPA has determined that in sensitive areas, drilling operations must be carefully controlled to minimize the potential for harm from discharges.

A requirement prohibiting or limiting discharge of material into a specified area means oil companies will have to evaluate several disposal alternatives. Decisions as to which alternative is most appropriate will be made by each company on an individual basis and will depend for the most part on economic considerations. The more obvious alternatives are: (1) to collect and transport for re-use; (2) to transport for shore disposal; (3) to transport for ocean disposal; and (4) to transport discharged materials through pipe to an area outside the restricted zone or reinject them into underlying formations. A number of these alternatives are now either being used or are planned for use as economically viable disposal mechanisms.

For example, a Department of Interior requirement for no discharge of drilling material was imposed in the Tanner Banks area in California. In this case the companies involved decided that ocean disposal would be the best alternative and requested EPA to issue an Ocean Dumping Permit. EPA will complete the environmental analysis for designation of an appropriate ocean dumping site in the near future, and the necessary ocean dumping permits will then be issued.

In a similar situation, under a State imposed permit restriction requiring no discharge off the West Coast of Florida, a request for an Ocean Dumping permit to dispose of drilling materials is now pending before EPA from companies who will be operating in that area.

In another case, off the California Coast, the alternative of piping production waters into underlying formations, and to treatment and disposal facilities on shore, is being utilized to meet permit requirements.

I would like at this point to give the Committees a brief summary of the status of EPA's efforts, under our regulatory and research programs, as they relate to oil and gas development in the George's Bank.

Our Region I Office in Boston has begun the process necessary for the issuance of NPDES permits for those tracts recently leased in the Georges Bank area. The Regional office recently met with representatives of the oil companies who will be operating on the leased tracts. The purpose of the meeting was to explain the permit process and review the requirements of a draft permit application. Information contained in the application will become part of the data which the Region will evaluate in reaching decisions as to whether special permit conditions will be imposed. It is anticipated that a few applications for exploratory drilling may be received within the next two to three months. Permit issuance would occur within 45 days of receipt of a completed application.

EPA has on-going research and monitoring programs designed to fill these regulatory needs, including the development of a marine toxicology expertise to identify drilling related impacts. Environmental concerns being addressed include the effects of chemicals discharged during oil and gas drilling activities that originate from: (a) "drilling fluids" or "drilling muds"—chemicals added to the well-bore; and (b) "cuttings"—formation solids that become coated with the drilling fluid in which they are suspended. Both mixtures of chemicals are normally discharged into the marine environment during exploratory and developmental drilling.

EPA's hazard assessment of oil and gas drilling and production related activities is managed by the Office of Research and Development's Environmental Research Laboratory at Gulf Breeze, Florida. The program is in the fourth year; the part specifically devoted to Georges Bank is now in the second year. That portion of the program dealing with the Georges Bank emphasizes potential risks to commercially important fisheries.

The specific program objectives are concerned with the development of information on what, if any, adverse environmental effects could occur from discharges during drilling and production activities. Some specific objectives of the EPA Research and Monitoring program that are related to the Georges Bank ecosystem are:

(1) Assess the effects of discharged chemicals on commercially important bottom feeding fish and shellfish. Organisms under study include the lobster, scallop, hake, and flounder.

(2) Assess the effects of discharged chemicals on physical and biological processes. These studies include evaluation of potential effects on sediment stability, ability of young organisms to develop normally, population structure, marine ecosystem diversity, productivity, and growth rates.

(3) Determine the persistence of and potential for concentration of discharged pollutants. This research emphasizes the fate of chemicals in the environment, including the ability or inability of chemicals to concentrate in organisms consumed by man.

(4) Develop methods appropriate for a biological and chemical monitoring scheme. The purpose of this research is to prepare a cost-effective and timely tiered system of testing to assess the fate and effects of drilling discharges on marine organisms from active drilling sites.

The development of additional data through this research will further assist in providing appropriate environmental controls on these activities, particularly in ecologically sensitive areas. Ideally, both over- and under-regulation should be minimized through timely and scientifically defensible research. In this way, data on environmental concentrations and toxicological effects of drilling fluids may help eliminate unjustified concern about certain chemicals being used in drilling fluids. Similarly, modified operating procedures or drilling fluid ingredient substitution may help mitigate environmental effects that are observed in region-specific and laboratory based research programs.

Thank you for giving me the opportunity to advise the Committees of EPA's regulatory authorities and supporting research with respect to oil and gas development on the OCS. I hope this discussion has been helpful in clarifying why we believe that existing regulatory programs are not only adequate to provide protection for the important fisheries resources on the Georges Bank, but also provide an important and necessary administrative flexibility to respond to our understanding of emerging scientific and site specific data.

This ends my prepared statement. I will be happy to answer any questions the Members may have at this time.

[The following information was subsequently received for the record:]

QUESTIONS OF THE COMMITTEE AND THE ANSWERS THERETO

Question 1. Congressman Studds mentioned shunting as a possible alternative barging. Considering that many of the commercially important species are bottom fish—is this a viable recourse in Georges Bank? Would this mitigate environmental damage to some extent?

Answer 1. In Congressman Studd's testimony before the combined committees he referred to responses made by scientists from NOAA, EPA and DOI concerning the topic of shunting off Georges Bank. He summarized that "EPA and NOAA agreed that shunting would not eliminate the adverse effects on on-site disposal of drill muds, while the Interior witnesses were uncertain." To elaborate on the response made by EPA scientists at that Subcommittee hearing and in answer to the current question of shunting as a viable resource on Georges Bank, it should be emphasized that shunting to any depth is an action based on a qualitative judgment that the biota at one stratum of the marine ecosystem are less important than biota at other strata. In the instance of the recommended bottom shunting in the proposed Flower Garden Marine Sanctuary, the particularly unique hydrography and presence of sensitive hard corals on the upper reaches of the Banks dictated this disposal technique.

On Georges Bank, the ecosystem is complex and sensitive organisms to be protectively considered are not found at only one level in the water column. Bottom shunting in an area of commercially important bottom feed fishes would seem ill-advised while surface discharges might be hazardous to fish eggs and larvae floating on the surface or suspended in the water column. Mid-depth shunting would have to very carefully considered in light of rich pelagic plankton populations and the increased biologic activity in mid column mixing zones. To reiterate, shunting might mitigate environmental damage to some biota at the expense of others.

Question 2. The Coast Guard mentions the stockpiling and use of dispersants as one measure to clean up oil on Georges Bank. There has been some controversy as to the toxicity of the dispersants themselves, especially on larvae. Under what condi-

tions would EPA, who regulates the use of these dispersants, allow their use on Georges Bank?

Answer 2. The use of dispersants as one measure to clean up oil in the marine environment is regulated by the National Oil and Hazardous Substances Pollution Contingency Plan. The conditions under which the Environmental Protection Agency, through its Regional Response Team (RRT) member, would approve the use of these dispersants are enumerated in Annex X of the Rules and Regulations.¹ Since dispersants are generally considered to be deleterious to marine life, the primary justification for dispersant use would be in the event that hazard to human life could be prevented or substantially reduced by such deployment. It is specifically the judgment of the EPA-RRT member to determine, on a case by case basis, that the use of dispersants will (1) prevent or reduce hazard to vulnerable species of waterfowl, or (2) result in the least overall environmental damage or interference with designated water uses.

Question 3. You mention that EPA is developing methods for appropriate monitoring schemes to determine if there is any damage to the environment or fisheries. Does that mean that at the current time the expertise does not exist to even do the studies that we have heard are so important?

Answer 3. EPA is currently active as a member of the Biological Task Force on Georges Bank (BTF) and chairs the Subcommittee on Monitoring. The Subcommittee submitted for review a preliminary plan for short-term monitoring of lease tract areas at the April 8, 1980, BTF meeting in Boston, Massachusetts, and expects to consider review comments of the short-term plan and design a correlative comprehensive long-term plan at the next Subcommittee session, May 7-8, 1980, in Woods Hole, Massachusetts. Because of the unique and dynamic ecosystem represented by Georges Bank, these monitoring plans must be tailored to accommodate specific conditions. To a large extent, the expertise for most components of a process-oriented monitoring program can be extracted from monitoring designs from other locations, however, no one program may be extrapolated into the Georges Bank situation.

Senator TSONGAS. Mr. Sneed?

Mr. SNEED. Yes, sir.

Senator TSONGAS. Welcome back.

Mr. SNEED. Good to see you again. I do appreciate—

Senator WEICKER. God, I feel sorry for you. They send you out as the pointman on every one of these things.

I have great admiration for your courage. I really and truly do. I think you are a brave man, a very decent man and tell some of those executives at Mobil to try your suit on for size once in a while and appear in your place.

Mr. SNEED. Of course, there was some apprehension when you referred to Mobil's ad. I think we covered that in February.

Senator TSONGAS. If I were Mobil, I would send you out, too. You are the most effective person they have ever sent to the Hill, as far as I can see.

I would like to get my hands on the ad writer, however.

Mr. SNEED. I appreciate those comments, and also being here to comment on the bill, the Georges Bank Protection Act.

I think it's in our best interest not to go over some of the things that are in the written statement because we did cover them last month on the 29th.

I will not reiterate on the Under Secretary's statement again. I did, though, Senator, put a copy of that statement that we made in Boston as a part of this record and, of course, want the entire thing to be a part of the record.

Senator TSONGAS. Both—it will be—in this record and the one in Boston?

¹ See Federal Register, Vol. 45, No. 55, Mar. 19, 1980, pp. 17856-60.

Mr. SNEED. And the one in Boston—cutting of oil and gas operations on the Georges Bank and the effect thereof if it were so mandated.

Before doing so, let me indicate by way of preliminaries that Mobil sees no need for enactment of S. 2119.

Some of the provisions of the bill are felt superfluous because the objectives have been achieved since the bill was proposed in December 1979, such as the Fisherman Contingency Fund regulations.

Other provisions are superfluous because the Outer Continental Shelf Lands Act Amendments (1978), the lease stipulations on leases issued under Sale 42, USGS OCS Order No. 5 and other statutes and regulations now in place already provide the Secretary of the Interior ample authority to insure the safety of oil and gas operations on Georges Bank.

What industry and the country now need is a commitment to proceed under these comprehensive laws, regulations, orders and stipulations. Redundant, but more inflexible like S. 2119 will only inhibit activities, without providing additional safety or clarity.

Before getting into costs, let me say, to my knowledge, there is no documented site specific case of a lasting detrimental environmental impact caused by disposal of drill cuttings associated with "water-base" drilling fluids into the marine ecosystems.

On the contrary, the practice of disposal at the use site is beneficial on an overall basis, as several onsite studies have demonstrated.

Senator TSONGAS. I don't want to go over the Boston testimony, either, but you know, telling people that disposal of material, some of which are toxic or potentially so, benefits the area in question and the ecosystem in question, really does stretch credibility just a bit, wouldn't you say?

Mr. SNEED. Well, I think it does because of the momentum and thought process in that direction. And I can only go to the site specific cases quoted in the Boston statement.

You can look at the site specific study of California and in the Gulf of Mexico, and you see an improvement in the bottom community and in the fish life.

But overall basis that I am referring to, there will be further documented by a case today that comes at the end of this statement.

So, bear with me and I think on the overall thing, even you will agree.

Senator TSONGAS. We could be here a long time.

Mr. SNEED. I will go back and tell them I tried. It is true that virtually all marine life forms would be exposed to lethal toxicity in mud pits containing only drilling mud in its commonly used concentrated form.

However, in the real world, marine life forms do not come in contact with drilling mud in high concentrations except at the immediate point of discharge. In fact, within 100 meters of the point of discharge in the marine environment, drilling must disperse to nontoxic levels.

Based on bioassay tests, concentrates of all chemical and physical properties are at nature's background levels within a short dis-

tance of the point of discharge, mainly due to the dispersion/dilution properties of mud in the ocean.

Suffocation of organisms from mud and cuttings may, of course, occur in a very small area when discharges are made initially.

The API comments on the Georges Bank Marine Sanctuary, specifically section I and attachment I of that document, set forth the volume and costs associated with hauling mud and cuttings from the Georges Bank. The "bottom line" says an operator will incur in excess of \$3.3 million per well to prepare and haul the mud and cuttings from the Georges Bank.

Not included in those estimates were costs for transporting and offloading after reaching shore, nor do they include costs of land transportation or landfill site disposal. No costs for dumping at a specified dumping site were included.

Our estimates were updated to include Mobil's projected costs since Lease Sale 42 occurred. Consequently, by adding in the estimate for the costs of transportation and landfill, the total costs of disposal of mud and cutting is \$5.3 million per well.

For the 91-well program estimate in the Sale 42 EIS, a cumulative cost of \$482 million would be incurred for this activity. With two additional sales in the North Atlantic now on Interior's proposed 5-year leasing schedule, one can easily project significant additions to this estimate.

Senator TSONGAS. Given that figure, how do you translate that into per-barrel costs?

Mr. SNEED. That would be pretty difficult. If it's of interest, I would like to supply it to you rather than give you—

Senator TSONGAS. It would be between \$2 and \$4, wouldn't it, a barrel?

Mr. SNEED. This is \$5.3 million per well. You would then have to take the revenue, or barrels coming back to get it to a dollar-per-barrel basis. If you want to take the 482 million and use our Interior's last 1.65 billion-barrel estimate of barrel-of-oil equivalent reserve, yes, we could come back at it that way.

You are going to have a meaningless number.

Senator TSONGAS. We can get a range of meaningless numbers.

Mr. SNEED. OK.

Senator TSONGAS. Let's take the most absurd number from Mobil's point of view, let's say \$4 a barrel.

Some would argue it's 30 cents, but let's say \$4 just to—

Mr. SNEED. To illustrate.

Senator TSONGAS. If we sell the oil at the world price, by that time the world price will be about \$40, I would guess. So you are talking about 10-percent cost on—and the price of that 10 percent would be the securing of the fisheries over, for infinity, of the fishing resources.

Is that 10 percent worth it?

Mr. SNEED. I don't think so. And I don't think that you should make such a decision until you are convinced you are buying something for it.

You are not going to buy insurance for the fishing industry by virtue of hauling mud and cuttings from the Georges Bank. You are going to impact something else that is far worse than disposing of mud and cuttings at the use site.

Senator TSONGAS. How is that?

Mr. SNEED. I will get to—

Senator TSONGAS. If these are nontoxic substances, why would it have an impact on anything?

Mr. SNEED. I would like to get to my California case in the statement. Just some of the specific items that would be associated with hauling mud away from the drilling site.

Mud has to be periodically removed from the system to make room for a different type of mud or, when necessary, to add other components that increase the volume.

Since we cannot accurately predict when mud will be discharged, it will be necessary to maintain two work boats during the 150-plus days' drilling of a typical well.

It is impossible to discharge mud to a mudboat during high seas. Space on the drilling rig severely limits the amount of storage for mud. Drilling operations must be suspended until weather conditions allow the transfer of mud from the rig.

We included all of these in our cost estimates arriving at \$5.3 million.

Senator TSONGAS. Let me insert in here a letter dated February 1 of this year from Congressman Emery to Congressman Studds.

I will just quote the relevant portions:

Specifically, during my analysis of the environmental and economic impact of the disposal of drilling muds and cuttings, I was informed by representatives of Texaco and Chevron, Mr. R. E. Hunt and Mr. Burt A. Hunley respectively, that the cost of off-site disposal would not present a financial burden in any way to exploration and development of hydrocarbons on the Georges Bank.

Include that in the record at this point.

[The letter follows:]

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
Washington, D.C., February 1, 1980.

CONGRESSMAN GERRY STUDDS,
*Longworth House Office Building,
Washington, D.C.*

DEAR GERRY: Due to my anticipated absence during the upcoming OCS hearing with Secretary Andrus, I wanted to recall to you a topic we touched on briefly in Committee last December.

Specifically, during my analysis of the environmental and economic impact of the disposal of drilling muds and cuttings, I was informed by representatives of Texaco and Chevron, Mr. R. E. Hunt and Mr. Burt A. Hunley respectively, that the cost of off-site disposal would not present a financial burden in any way to exploration and development of hydrocarbons on the Georges Bank. Also, the testimony last December regarding the potential of barging mishaps during the transport of drilling wastes was rather unclear. Perhaps you can assess the probability and impact of such operations.

I wish you success in resolving these issues. Certainly, as we have noted before, the assumption that the natural environment is a public good of infinite quantity is a notion that will cause us much greater expense in the future.

Best regards,
Sincerely,

DAVID F. EMERY, *Member of Congress.*

Senator TSONGAS. So there is discussion in the industry.

Mr. SNEED. Yes, sir.

Senator TSONGAS. I am not saying who is right or wrong. I just wanted to point that out.

Mr. SNEED. My impression of the statement is that by far the costs are incurred prior to land transportation and landfill disposal site costs.

Shunting of mud and cuttings to near bottom under Interior's Stipulation 4 is a cheaper, safer and environmentally preferable means of disposal.

While the Secretary could forbid any discharge of mud and cuttings by lessees under Stipulation 4, the economic cost of such an order or of the similar prohibition contained in S. 2119 is so great that we cannot believe such action is justified by an objective cost/benefit analysis.

While the economic costs of hauling muds and cuttings are significant and would materially add to already inflated and ever-increasing exploration costs (which, in the final analysis, will increase the cost to energy consumers), it is also important to examine the environmental costs of requiring land disposal.

We stand behind the statement that there is no evidence from onsite studies of any lasting negative environmental impact to the marine environment in established operating areas with characteristics similar to the Georges Bank. If, however, in an effort to avoid some hypothetical peril to the ocean, you should require land disposal, you must examine the environmental consequences of concentrating mud and cuttings in a land location.

Perhaps a concrete example will clarify this issue. We attach to this statement a letter of February 15, 1980, transmitting a study conducted by the California States Lands Commission to the California Coastal Commission.

In this study, the State Lands Commission has concluded that the best method is to dispose of drilling mud and cuttings at the site where they are used.

You should note, that from 1970 to date, the state has required drilling mud and cuttings in state waters to be hauled away to landfill disposal sites.

Senator TSONGAS. There are comparable fisheries resources in California to the Georges Bank in the sense of an enclosed hydrology?

Mr. SNEED. We touched on that last month and I have been doing more questioning and probing. Not to the extent of the uniqueness or the size of Georges Bank, but, yes, sir, there are gyers on the coast of California and in the Gulf of Mexico. Their predictability is somewhat less than the Georges Bank.

Senator TSONGAS. Let me ask you a policy question. Let me say if we pursue this hypothetical and mandate this 30 cent to \$4 cost per barrel which will just be passed on, as you say, to the consumer, why does Mobil object to that?

The argument Mobil makes anyway is that the windfall profits will take all the money anyway.

Mr. SNEED. I believe it will be inflationary. We are going to pass it on to the consumer. I just think that it goes against the grain to anything if you are not securing a benefit.

That is where we are apart, whether or not a benefit is going to be gained.

Senator TSONGAS. I can accept that. Would you agree that if there is a benefit to be secured, that the cost is worthwhile? If the benefit is not hypothetical, but actually real.

Mr. SNEED. Certainly.

Senator TSONGAS. That is fair enough.

Mr. SNEED. The State of California did conclude that the disposal onsite drilling for the—and cuttings would decrease the potential on shore and offshore, air, water, and noise pollution, decrease the need for the use of presently disappearing class 1 disposal sites, and make them available for other priority users.

Decrease the pressure on harbor vessels. Decrease the probability of accidents in transit to harbors and potential spills, decrease ship traffic in heavily traveled recreational and commercial waterways.

They are saying, in effect, that what they have been ordering for 10 years was wrong, and they are so changing.

That's been our contention in the past. It is continuing as our contention today.

In closing, I would like to say that only exploratory drilling will confirm or deny the existence of oil and gas at Georges Bank.

The USGS estimates the mean potential of the recoverable reserves at 1.65 billion barrels of oil equivalent ranging upward to 4.78 billion barrels of oil equivalent from the North Atlantic out to a 100-meter water depth.

Commercial quantities of this magnitude and at this location will add vitally needed supplies to our domestic inventories.

The stringent protection of all OCS areas has been provided for by detailed regulations already in place. We urge industry to be encouraged to move forward as rapidly as possible toward reducing U.S. reliance on imported energy.

[The statement follows:]¹

STATEMENT OF J. T. SNEED, MANAGER, ENVIRONMENTAL AFFAIRS, MOBIL OIL CORP.

Mr. Chairman and Members of the Committees, I appreciate your invitation to appear today to testify on S. 2119, the Georges Bank Protection Act. A month ago, on February 29 in Boston, Mass., I also testified before the joint hearing of the Select Committee on Small Business, The Committee on Commerce, Science and Transportation and the Subcommittee on Energy Resources and Materials Production of the Committee on Energy and Natural Resources on the effects of Outer Continental Shelf activities on the Georges Bank on the fishing industry there. The testimony I offered there is attached to this statement (Attachment I), and I would appreciate that both be made a part of this record.

I am Jim Sneed, Manager, Environmental Affairs for Mobil Oil Corp. in the Exploration and Producing Division located in New York. My assignments with Mobil over the past 25 years have been spent in various phases of exploration and producing work. Prior to my current assignment, I spent five years in offshore producing operations in the Gulf of Mexico.

Currently I serve on several industry committees concerned with the environmental aspects of exploration and producing operations. During recent months I have attended Government and industry forums relating specifically to the forthcoming activities stemming from Sale 42 on the Georges Bank.

Mobil along with others in industry have demonstrated an excellent record of performance in the U.S. Outer Continental Shelf activities. As stated by Under Secretary of Interior, James A. Joseph, before the OCS Advisory Board on December 6, 1979:

"Offshore oil on the U.S. OCS has had only one major pollution incident in its history—Santa Barbara, a decade ago. It has not caused harm to valuable commer-

¹The attachments referred to in the statement have been placed in the committee files.

cial and recreational fisheries anywhere it is operating—in the Gulf of Mexico, Atlantic, off California and Alaska.”

That record spans over 30 years with over 23,000 wells drilled in U.S. offshore areas. In addition, this industry has gained experience in worldwide petroleum exploration in more than 100 countries. Much of this offshore experience was gained in more hostile nature environments than the Georges Bank, for example, the North Sea and the Alaskan Cook Inlet.

I have been advised that you would like comments from me addressing the estimated costs of hauling drilling muds and cuttings from oil and gas operations on the Georges Bank and the effect thereof if such were mandated. Before doing so let me indicate by way of preliminaries that Mobil sees no need for the enactment of S. 2119. Some of the provisions of that Bill are superfluous because their objectives have been achieved since the Bill was proposed in December 1979 (i.e. the Fisherman Contingency Fund regulations). Other provisions are superfluous because the Outer Continental Shelf Lands Act Amendments (1978), the lease stipulations on leases issued under Sale 42, USGS OCS Order No. 5 and other statutes and regulations now in place already provide the Secretary of Interior ample authority to insure the safety of oil and gas operations on Georges Bank. What industry and the country now need is a commitment to proceed under these comprehensive laws, regulations, orders and stipulations. Redundant, but more inflexible like S. 2119 will only inhibit activities, without providing additional safety or clarity.

Before getting into costs let me say, to my knowledge, there is no documented site specific case of a lasting detrimental environmental impact caused by disposal of drill cuttings associated with “water-base” drilling fluids into the marine ecosystems. On the contrary, the practice of disposal at the use site is beneficial on an overall basis, as several onsite studies have demonstrated. (Referenced studies are documented in Attachment I and in this statement.)

I use the term “water-base” drilling fluid, yet, drilling fluid does not necessarily have a uniform definition. My comments here will be directed to “water-base” fluids which Mobil will use during our exploration program on the Georges Bank, as is indicated in our application to EPA for a National Pollutant Discharge Elimination System (NPDES) permit.

Such “water-base” drilling fluids match the narrative description of drilling fluids submitted in the API’s response to the Georges Bank Marine Sanctuary issue paper, August 31, 1979 to National Oceanic and Atmospheric Administration (NOAA), page I-27 (Attachment II). Mobil participated with other industry representatives in formulating the API comments on NOAA’s Georges Bank Marine Sanctuary proposal, and we consider the entire API response to be a comprehensive review of this operating problem in the Georges Bank.

It is true that virtually all marine life forms would be exposed to lethal toxicity in mud pits containing only drilling mud in its commonly used concentrated form. However, in the real world, marine life forms do not come in contact with drilling mud in high concentrations except at the immediate point of discharge. In fact within 100 meters of the point of discharge in the marine environment, drilling mud disperse to non-toxic levels. Based on bioassay tests, concentrations of all chemical and physical properties are at nature’s background levels within a short distance of the point of discharge, mainly due to the dispersion/dilution properties of mud in the ocean. Suffocation of some organisms from mud and cuttings may, of course, occur in a very small area when discharges are made initially. Studies supporting these views are set forth in my statement of February 29, 1980.

Also stated in that document, scientific reviews of relatively old producing areas have established there were no chronic adverse effects of drilling fluids and cuttings disposed by dumping at the use site in the ocean at locations reasonably similar to Georges Bank. Some people argue studies do not necessarily prove that detrimental effects are not occurring. Until adverse effects are demonstrated and a better alternative method can be adopted, we see wisdom in continuing disposing of mud and cutting at the site of their use. Laboratory research is an excellent place to initiate study of the effects, but to date these studies have not been able to reach a consensus because procedures and assumptions are too easily challenged. Further the actual environmental world can simply not be duplicated in the laboratory. At the risk of being redundant, only site specific case studies should be used to influence regulatory actions.

The API comments on the Georges Bank Marine Sanctuary, specifically Section I and Attachment I of that document, set forth the volume and costs associated with hauling mud and cuttings from the Georges Bank. The “bottom line” says an operator will incur in excess of \$3.3 million per well to prepare and haul the mud and cuttings from the Georges Bank. Not included in those estimates were costs for

transporting and offloading after reaching shore, nor do they include costs of land transportation or landfill site disposal. No costs for dumping at a specified ocean dumping site were included.

Mobil's estimates likewise do not include costs for ocean dumping, since ocean dumping permits are not now available to industry, and we do not consider them a likely alternative during the exploration phase of Sale 42 tracts on the Georges Bank. We have included estimates of costs for transportation to landfills and for landfill site disposal of mud and cuttings. These costs are estimated to be \$1.1 million per well.

Our estimates were updated to include Mobil's projected costs since Lease Sale 42 occurred. Consequently, by adding in the estimate for the costs of transportation and landfill, the total costs of disposal of mud and cuttings is \$5.3 million per well. For the 91 well program estimated in the Sale 42 EIS, a cumulative cost of \$482 million would be incurred for this activity. With two additional sales now on Interior's proposed five year leasing schedule, one can easily project significant additions to this estimate.

Some specific items that would be associated with hauling mud away from the drilling site are:

1. Mud has to be periodically removed from the system to make room for a different type of mud or when necessary to add other components that increase the volume.

2. Since we cannot accurately predict when mud will be discharged, it will be necessary to maintain two work boats during the 150 + days drilling of a typical well.

3. It is impossible to discharge mud to a mudboat during high seas. Space on the drilling rig severely limits the amount of storage for mud. Drilling operations must be suspended until weather conditions allow the transfer of mud from the rig.

These factors have been included in our cost estimates.

S. 2119 also requires the reinjection of formation waters. API provided an estimated cost of reinjecting at approximately \$133 million in comments on the Georges Bank Marine Sanctuary. Mobil agrees with this estimate and I did not attempt to update these costs simply because that decision is considerably in the future by at least five years. By no means do we want to detract from this important decision. Our positions remains that reinjection is not warranted and an objective cost/benefit analysis will bear this out.

Shunting of mud and cuttings to near bottom under Interior's Stipulation 4 is a cheaper, safer and environmentally preferable means of disposal. While the Secretary could forbid any discharge of mud and cuttings by lessees under Stipulation 4, the economic cost of such an order or of the similar prohibition contained in S 2119 is so great that we cannot believe such action is justified by an objective cost/benefit analysis.

While the economic costs of hauling muds and cuttings are significant and would materially add to already inflated and ever-increasing exploration costs (which, in the final analysis, will increase the cost to energy consumers), it is also important to examine the environmental costs of requiring land disposal. We stand behind the statement that there is no evidence from onsite studies of any lasting negative environmental impact to the marine environment in established operating areas with characteristics similar to the Georges Bank from drilling mud and cuttings. If, however, in an effort to avoid some hypothetical peril to the ocean, you should require land disposal, you must examine the environmental consequences of concentrating mud and cuttings in a land location.

Perhaps a concrete example will clarify this issue. We attach to this statement a letter of February 15, 1980 transmitting a study conducted by the California State Lands Commission to the California Coastal Commission (Attachment III). In this study the State Lands Commission has concluded that the best method is to dispose of drilling mud and cuttings at the site where they are used. You should note, that from 1970 to date, the State of California has required drilling mud and cuttings in State waters to be hauled away to landfill disposal sites. Based on detailed site specific studies, the State Lands Commission has now concluded that onsite disposal of "water-base" mud and cuttings would:

1. Decrease the potential offshore air and water pollution due to ship/barge transport to shore facilities.

2. Decrease potential onshore air and noise pollution.

3. Decrease the need for use of the present rapidly disappearing Class I disposal sites, and make these available for other priority users.

4. Decrease the pressure on harbor facilities.

5. Decrease the probability of accidents in transit to harbors and potential spills.

6. Decrease ship traffic in heavily traveled recreational and commercial waterways.

The report of the State Lands Commission admits, in effect, the California practice has been wrong! When weighing the overall factors, they judge onsite ocean disposal to be more desirable and effective than the practice endorsed over the last 10 years. This is precisely what industry has always contended and is contending here today.

On this particular subject, I am disappointed with some members of the scientific/academic community when they tell a body such as this—"There may be toxic effects. . .". "There may be unique biologic communities on the Georges Bank. . .". "We just don't know the effect of drilling mud toxicity." This practice of disposing water-base muds at the use site has been going on for over 30 years in the U.S. OCS without any measurable adverse long term effects. There has been ample opportunity for study. We are not proposing any novel technology.

When this committee or any other duly authorized Government body is presented with facts to justify a better environmental system for disposal of mud and cuttings, only then should you consider actions that will burden the energy consumers with a more expensive alternative. If such conclusive evidence of harm were ever logically and scientifically documented, Mobil would support an alternative procedure.

In summary, Mobil recommends that the Committee not approve S 2119 and rely on existing laws and regulations and stipulations governing exploration and producing activities now in place and/or in the process of final promulgation. These safeguards for the Georges Bank fishing industry and the community as a whole are more than adequate. The necessary flexibility exists to adjust the regulations if evidence supports a change.

Only exploratory drilling will confirm or deny the existence of oil and gas at Georges Bank. The USGS estimates the mean potential of the recoverable reserves at 1.65 billion barrels of oil equivalent ranging upward to 4.78 billion barrels of oil equivalent from the North Atlantic out to 200M water depth. Commercial quantities of this magnitude and at this location will add vitally needed supplies to our domestic inventories. The stringent protection of all OCS areas has been provided for by detailed regulations already in place. We urge industry be encouraged to move forward as rapidly as possible toward reducing U.S. reliance on imported energy.

Senator TSONGAS. Thank you. We will go on to the next panel.

The biological task force panel, Mr. Peterson and Mr. Danenberger.

STATEMENTS OF ALLEN PETERSON, CHAIRMAN, BIOLOGICAL TASK FORCE, NORTHEAST REGIONAL DIRECTOR, NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION; AND ELMER DANENBERGER, DISTRICT OIL AND GAS SUPERVISOR, U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

Mr. PETERSON. Thank you, Mr. Chairman.

Senator TSONGAS. Mr. Peterson, since you and we have had discussions before, rather than repeat those, why don't we have your statement included in the record. We will go from there.

Mr. PETERSON. I appreciate that, Mr. Chairman.

Senator TSONGAS. Said with a straight face, the record will reflect.

Mr. PETERSON. As one of your constituents, I will remember that.

Senator TSONGAS. I take it all back.

Mr. PETERSON. Would you care that I paraphrase a few comments, Mr. Chairman?

Senator TSONGAS. What I am trying to get at is the issue, what is the task force doing, what can we look forward to, what is the absorption capacity of the information EPA is getting now, that kind of thing.

Mr. PETERSON. Let me say the task force is just getting underway. We have held one meeting. The second was scheduled on this date. We canceled it in deference to the hearings. At our first meeting, in addition to the procedural aspects, we established a monitoring committee, as was pointed out earlier. They have met. EPA is chairing that subcommittee to develop short- and long-term monitoring aspects.

Senator TSONGAS. Where do you meet?

Mr. PETERSON. The first meeting was held in Hyannis, the second will probably be in the Boston area. The ground rules are that they will be open public meetings and we invite anybody to come in and watch the proceedings. By necessity we will have to limit the discussion from the outside area.

We are in the process also at this time of assembling all of the data available through the member agencies into one compendium for presentation to the task force so that we all start with the same data base. I think that is more pertinent to the questions you have been asking. So, at least we all have the same deck of cards we are to play with when making our decisions.

Beyond that, Mr. Danenberger, as the supervisor, has outlined the process and what he sees as the time schedule. At our next meeting we will be getting into, first, the monitoring report from the monitoring committee, and I don't know what action will be taken at this time because I haven't seen the discussions that they have had. But we will also be identifying those other issues that have been spelled out in the charter that we need to address; critical areas, if we can define critical areas. We will recommend any actions that can be taken to protect those areas.

We will also look at issues here before the committee in terms of the bill. These are issues we will be very much involved in, examining the data to the best of our ability, drawing on any outside expertise available, and hopefully make a very deliberative, responsive recommendation to the supervisor.

But I cannot predict at this time what those positions would be.

Senator TSONGAS. Do you think that the influx of information is adequate given the timeframe of the lease sale?

Mr. PETERSON. Personally, I have reservations from my knowledge of the data that is available and I am trained as a marine biologist, as a scientist. I guess that probably reflects my reservations. I think there is always a concern as to whether the data is sufficient to draw critical conclusions. But I do think we have the working mechanism with five agencies with very capable people participating. I think the debate will be substantive and the decisions will probably be fairly reflective of the best position possible.

Senator TSONGAS. If you could break the argument down, as I tried to do, to the simple question, is it worth 30 cents to \$4 a barrel to impose these kinds of restrictions, is that a framework within which you are operating or is that economic consideration—

Mr. PETERSON. I don't know what those judgments will be. I think from our perspective, as one member of NOAA, I would tend to look at the scientific data. If we draw positions that would show that there would be significant impact on environmental resources, then that would be the recommendation that I would pursue indi-

vidually. I don't believe it is in the realm of the task force, certainly, not my responsibility, to evaluate the economic aspects. Those are the decisions Mr. Danenberger and the Director of the Survey and ultimately maybe Secretary Andrus will have to make.

Senator TSONGAS. Are you going to look into the issue Mr. Sneed raised as to, well, if you take these muds and dispose of them on land, you have got another problem on your hands?

Mr. PETERSON. To make an honest evaluation we always have to look at the alternative impacts. If it's assumed that the muds may be harmful to the environment to be left there at the well site, we also have to examine the impacts of potential problems for removing those. That would be the only fair way to make a sound technical judgment.

Senator TSONGAS. All right.

Mr. PETERSON. Just briefly, I think the task force does provide a unique opportunity to take some of the issues that have been raised and particularly remove them from some of the rhetoric area and put them into a decisionmaking process. I believe it is important. The positions of various agencies have been well understood before.

But I think we are now in a critical position of having to decide amongst the technical staff, and exercise our full capabilities and try to come to a decision, as I indicated. I think it can work, and I believe the ability and commitment of various agencies is there to make it work.

I guess if I had a reservation, it comes into the ultimate area of decisionmaking as to how precise and how definitively judgment can be made in these areas in the short time frame, then ultimately how that decision is exercised, which then goes beyond the task force itself.

Senator TSONGAS. If the task force were to be restructured to make it more effective, what kind of recommendation would you make in that direction?

Mr. PETERSON. Personally I am a believer in committees of one. But that is not the method of operation here. Basically the task force is structured fairly well. One could argue whether the voting mechanism is real or not, and perhaps some of those people that have been invited to participate, representatives of the States and Fisheries Management Council, could be made members. If the issue is decided on 3 to 2 votes, I am not sure that is going to be very conclusive evidence anyway and it still puts it in the realm of a policy decision rather than a scientific one.

I am not sure having more members from a voting point of view will make the issue any clearer. If we can't come out with a fairly strong unanimous or near unanimous position then I would say we are probably still left with as much gray area about the technical approach as we had to be begin with.

Senator TSONGAS. Isn't the product of your committee credibility? That is why the thing was put together.

Mr. PETERSON. Yes, the product is credibility but I believe that will be judged by the sincerity with which the committee approaches its work, the decisions that are reached, and the recommendations presented by the committee. I think that will be the

judgment of the committee. Whether or not the process works will be a judgment that is made further on.

Senator TSONGAS. Well, you know in the political arena, what is apparent is as important as what is real. Even if all the members are dedicated and honest and forthright, if there is a perception, noninclusion, by X, then you are really sort of sweeping back the time.

Mr. PETERSON. I think that is true. As the chairman, I certainly will commit myself to make sure that if there are differences of opinion, or other people outside the committee have pertinent information, that it will be considered. I believe we have learned some things from some of the other public processes we have been through, particularly the Regional Fisheries Management Council, that leads us in an area which we can develop credibility with the people that will be reviewing the process of the committee itself.

Senator TSONGAS. NOAA recommended the barging of the muds and cuttings, and that was rejected. What makes you think that the recommendations of the task force will be treated with proper respect?

Mr. PETERSON. I have made no assumptions as to how the decisions of the task force would be treated. I am working from the level that I think the task force will provide very good recommendations. I think that those recommendations, by the fact that they have been drawn together by all of the various agencies in a common framework using common data will tend to lend more weight and credence to the recommendations. I make no judgments as to how they will be accepted and ultimately acted on.

Senator TSONGAS. Were you here when Congressman Studts testified how effective the level of operative is?

Mr. PETERSON. Yes.

Senator TSONGAS. Well, we expect it to be good. We may have to come back and apologize to all the admirals.

Mr. PETERSON. I have nothing else to add unless you have further comments, Mr. Chairman.

[The statement follows:]

STATEMENT OF ALLEN E. PETERSON, REGIONAL DIRECTOR, NATIONAL MARINE FISHERIES SERVICE, NORTHEAST REGION, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Mr. Chairman and Members of the Committees, thank you for the opportunity to testify on the purpose, potential and challenge before the Biological Task Force for OCS Lease Sale No. 2, on Georges Bank. This group was formed because of the acknowledged uncertainties about exactly how and to what extent oil and gas development will affect the Georges Bank marine ecosystem and the important commercial fishery which it supports. The Biological Task Force affords a mechanism, over and above the regulatory mechanisms and authorities already held by agencies comprising Task Force membership, to give added surveillance and protection to the unique system of Georges Bank. I believe such a mechanism is needed, and I believe the member agencies and states can make it work in a way that is complementary to other mechanisms and authorities.

I am the Regional Director of the Northwest Region, National Marine Fisheries Service (NMFS), and I have been appointed as the NOAA representative on the Biological Task Force. I also had the honor, at the first meeting of the Task Force, to be selected as presiding officer of that body during its first year of operation.

The Task Force is composed of one representative each from the Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), the Geological Survey (GS), the Environmental Protection Agency (EPA), and the National Oceanic and Atmospheric Administration (NOAA). Representatives of the affected coastal states

have also been invited to participate in activities of the Task Force, but are not formal voting members. The same is true of the New England Fishery Management Council.

The purpose of the Task Force is to advise the GS Oil and Gas Supervisor on aspects of oil and gas operations that affect biological resources of Georges Bank and their habitats. The charge to the Task Force includes making recommendations on enforcement of stipulations relating to the protection of living marine resources and their habitats, on design of environmental studies and surveys, and on sampling to provide early warning of adverse impacts.

The Task Force operates under a charter signed by the Secretary, Department of the Interior; Administrator, Environmental Protection Agency; and Administrator, National Oceanic and Atmospheric Administration. On a rotating basis, a presiding officer is selected from among Task Force members to serve a one year term. The presiding officer's responsibilities include preparing the meeting agenda, scheduling and conducting meetings, providing the views and recommendations of the Task Force to the GS Oil and Gas Supervisor, and communicating the Supervisor's responses to the Task Force. The Task Force has no staff of its own, and no formal advisory groups. It may establish subcommittees to consider specific issues as appropriate. Both the Task Force and its subcommittees can and will seek expert advice as needed, both from within member agencies and from sources outside the Federal Government. For example, I call on the NMFS Northeast Fisheries Center for scientific support, and the Monitoring Subcommittee is getting assistance from scientists at a number of institutions.

The charter makes provision for the Task Force to be kept advised of pertinent information relating to its mission. Task Force members may request such information from participating agencies. Additionally, specific responsibilities for provision of information are placed on some members: e.g., the BLM representative shall provide relevant information from BLM's environmental studies program; the EPA representative shall provide information resulting from National Pollution Discharge Elimination System (NPDES) permits; the GS Supervisor shall inform members of his actions on a decision which may significantly affect biological resources on Georges Bank and their habitats, as well as supplying relevant information obtained from studies, surveys and sampling undertaken pursuant to Stipulation No. 2, environmental reports submitted with exploration, development and production plans, environmental assessments and environmental statements prepared for proposed activities on Georges Bank, and permit applications.

The Task Force, for its part, is responsible for identifying areas of Georges Bank which are of special concern; recommending studies, surveys, and sampling; recommending criteria for evaluation of adverse biological effects on the Georges Bank ecosystem; recommending mitigating measures designed to protect biological resources; and advising the Supervisor of any adverse impacts on the marine environment from oil and gas operations.

Task Force procedures provide for written recommendations to be made by the presiding officer to the Supervisor following informal, oral consultation with the Supervisor. The Supervisor's response to the Task Force must be in writing, not more than five working days from receipt of the recommendation. The charter establishes review procedures for any Task Force recommendations not accepted by the Supervisor, and provides that such review shall take place if the heads of two or more member agencies request it.

The Task Force held its organization meeting in February. At that time I was selected as presiding officer, and a Subcommittee on Monitoring was established. Review of available publications, data, and other information on Georges Bank was arranged for; the GS schedule for offshore activities on Georges Bank was outlined by the Supervisor; and EPA described its NPDES permitting procedures. Possibilities for short-term and long-term monitoring and sampling were discussed. The Monitoring Subcommittee met March 18-19 with many interested scientists and observers. The agenda of the next full Task Force meeting (originally scheduled for today, but now deferred until April 8) will hear the report of the Monitoring Subcommittee, review the information compiled by the group assigned to collect and display it, and proceed with development of recommendations.

Mr. Chairman, this concludes my statement, I will be pleased to answer any questions you may have.

Senator TSONGAS. Fine. I was not here when you were at the table. I take it you have not given this testimony?

Mr. DANENBERGER. Right.

Senator TSONGAS. Why don't you proceed.

Mr. DANENBERGER. I will just submit the testimony for the record and summarize some of the highlights.

My viewpoint is that the Biological Task Force and district office will be mutually supportive. We are both going to be dependent on advice and continuous exchange of information from the other party. I will be very much dependent on the Biological Task Force for advice on the marine ecosystem and methods for protecting it. I am very happy to be able to be dependent on them because it's going to make some of my decisions that much easier.

Senator TSONGAS. You are in fact the virtual decisionmaker on this issue.

Mr. DANENBERGER. On the day-to-day operations and on the imposition of any implementation of regulations, right.

Senator TSONGAS. That is what I said.

Mr. DANENBERGER. That's correct.

I also think that the Biological Task Force will be very much dependent on my office for information on operating practices and our regulations, the status of operations, information we have from lessees, things like that.

I was asked to comment on the role of the task force in the implementation of some of the lease stipulations. Lease stipulation No. 2 authorizes the supervisor to require special surveys or special monitoring programs if it's necessary to protect special biological features. The task force is presently looking at this question. They will be providing recommendations as to whether or not any pre-drilling surveys are required before operators are told what requirements are going to be placed on them prior to submittal of their exploration plans.

There is also lease stipulation No. 4 which authorizes the supervisor to prescribe methods for the disposal of drilling effluents. This is another question that is being reviewed by the task force. And I will be expecting specific recommendations from them on this.

There's a fisheries training program in the process of being developed especially for the North Atlantic area. All operating personnel will be required to take it. We have drafted guidelines as to the requirements for this type of program, and are going to ask for the help of the Biological Task Force in reviewing submitted programs to evaluate their effectiveness.

With regard to some of the other stipulations that are more directly related to production, such as the disposal of formation water and product transportation, the task force will be called on at a later date, if any commercial discoveries are made on the Georges Bank.

As was previously mentioned, we are in the process of evaluating oil spill contingency plan requirements for the Georges Bank. I have consulted mostly with the Coast Guard and Regional Response Team. I also plan to ask for recommendations from the Biological Task Force as to areas that might be especially vulnerable to an oil spill, and which could be useful in planning the staging of spill equipment. My impressions to date have been very favorable on the operation of the task force.

I think they are very serious about what they are doing, have taken a lot of initiative and I am expecting that their recommendations will be very useful for my staff.

That is just a brief summary of what was said in the statement. If there are any questions, I will be glad to answer them.

[The statement follows:]

STATEMENT OF ELMER P. DANENBERGER DISTRICT OIL AND GAS SUPERVISOR,
USGS, DEPARTMENT OF THE INTERIOR

As North Atlantic District Supervisor, I view the Biological Task Force and my office as being mutually supportive. Both the District office and the task force will be dependent on a continuous exchange of information ideas, and recommendations. My office will rely heavily on the task force for information and advice regarding the biological resources of the Georges Bank. The task force will be dependent on the North Atlantic District for updated information on the status of oil and gas exploration activities, offshore operating practices, the types and volumes of effluents which may be discharged, and geological Survey operating Orders and enforcement procedures.

At the first meeting of the Biological Task Force (February 12, 1980, Hyannis, MA), the responsibilities of the designated representatives, the member Agencies, and the Geological survey's North Atlantic District were discussed. At that meeting, I asked the task force members for specific advice regarding the implementation of Lease Stipulation No. 2. This stipulation authorizes the Supervisor to require special environmental surveys if biological populations or habitats that may require additional protection are identified.

If any special predrilling surveys are to be required, operators need to be so informed prior to the preparation of Exploration Plans. I have asked the task force for recommendations regarding the necessity and utility of predrilling surveys, sites which should be surveyed, and the types of surveys which should be required. The task force members are presently reviewing Georges Bank fisheries and environmental data prior to a decision on the site survey recommendations. I have informed the oil and gas operators that my decision on predrilling environmental surveys would not be made until the task force recommendations have been received.

I am also awaiting the results of efforts by the subcommittee of the task force that has been formed to consider Georges Bank monitoring. The subcommittee has been charged with the responsibility of evaluating technical, budgeting, and timing aspects of a monitoring program to assist the Geological Survey and other OCS regulatory Agencies. I expect the results of the subcommittee's efforts will have a bearing not only on the implementation of Stipulation No. 2 and operating requirements for the Georges Bank, but also on the environmental studies programs of the member Agencies.

Stipulation No. 4 authorizes the Supervisor to prescribe methods for the disposal of drilling fluids, cuttings, and formation waters. The task force has been advised of the need for recommendations on discharge procedures for drilling effluents. After these recommendations have been received, operators will be informed of the specific discharge requirements. I also intend to work closely with EPA on coordinating our respective requirements for drilling discharges. Because formation water disposal is associated only with production operations, no specific recommendations on this matter are being requested at this time.

Stipulation No. 6 requires each lessee to submit a fisheries training program with his Georges Bank Exploration Plan. The purpose of the training program is to familiarize oil and gas personnel with fishing methods, the value of the commercial fishing industry, and methods for minimizing conflict between the fishing and petroleum industries. The Geological Survey has drafted a Notice to Lessees which specifies requirements for the program. A number of comments on the draft Notice were received from the North Atlantic States and from Federal Agencies, and the final Notice is now being prepared. After the lessees have prepared their training program, Biological Task Force members and State representatives will be asked to review the training program and evaluate its quality and effectiveness. This will serve as a means of reviewing the programs before they are formally submitted with Exploration Plans.

Stipulation No. 3 relates to the use of pipelines in the transportation of production from Sale No. 42 leases. The Department of the Interior has established an Intergovernmental Planning Program, one of the functions of which is the evalua-

tion of transportation alternatives. Should commercial discoveries be made, the Biological Task Force will be asked to participate in the production planning process, including the selection of the proper transportation mode.

All operators must submit, with or prior to the Exploration Plan submittal, an Oilspill Contingency Plan which details response capabilities in the event of a spill. Because of the distance of the leases from shore, certain equipment will be maintained on an offshore rig or workboat to minimize response times. I have asked the Coast Guard and the Regional Response Team to make recommendations regarding spill-control equipment and response procedures. The Regional Response Team is also preparing a vulnerability index for the North Atlantic coastline. This index will identify those areas which would be most severely impacted by a spill. The Biological Task Force will be asked, on the basis of their review of Georges Bank environmental data, to identify offshore areas which are most sensitive to the effects of an oilspill. Both of these evaluations will be used in oilspill contingency planning.

I expect to work closely with the Biological Task Force and to provide them with any available data which would be useful in the conduct of their activities. I also intend to continuously inform the task force on the status of offshore activities and Geological Survey regulatory actions. Because my office will be continuously consulting with the task force, I do not expect to be surprised or uninformed regarding task force recommendations. In the unlikely event that there is a significant disagreement on a task force recommendation, I will consult with the Presiding Officer or the entire task force to discuss their justification for the recommendation and the nature of the disagreement. If we cannot resolve our differences, I will present my position, in writing, to the task force. If the task force is dissatisfied with this position, they may ask that it be reviewed, in accordance with the task force charter, by the Director of the Geological Survey and the Secretary of the Interior.

My impressions of the Biological Task Force, as a result of our initial meeting, are very positive. I was impressed by the initiative and organizational capabilities demonstrated by the members, and I believe Allen Peterson will be an excellent Presiding Officer. I also believe the Biological Task Force framework will provide an excellent mechanism for coordinating Federal and State regulatory programs as they relate to OCS oil and gas operations.

Senator TSONGAS. What is your background?

Mr. DANENBERGER. My B.S. degree is as a petroleum engineer. I worked for USGS for 8 years, on the gulf coast, in Reston, Va., and on special assignments in other areas. I have also done some graduate work in environmental pollution control. I have a master's degree in that.

Senator TSONGAS. Do you have anybody in your shop who has a background in the difference between a tuna and mackerel?

Mr. DANENBERGER. Yes, I have a position for a fisheries biologist on my staff and am in the process now of going over applications and making a selection. Also, I plan to hire an environmental specialist with more general understanding of environmental conditions specifically related to fisheries.

Senator TSONGAS. So this person, the fisheries person obviously would be new and would have to learn the task force.

Mr. DANENBERGER. Right. Work very closely with the task force, serve, I guess, as an intermediary between the fishing organizations and our office, and continually keep people updated as to what our programs are and any problems that might be arising as a result of the operations.

Senator TSONGAS. Let me ask one final question so we can get on to the next panel. How do we know if the system is breaking down? What do we look for?

Mr. DANENBERGER. Well, I guess if the recommendation is made and not accepted by my office, then there will be a subsequent appeal to the Director of the Geological Survey and then to the Secretary.

Senator TSONGAS. I mean that is obvious in terms of that level of decisionmaking. But I mean as you go along. How do we know that there is communication back and forth?

Mr. DANENBERGER. Well, you are welcome to attend the meetings and keep close contact with my staff, and call and ask what the Geological Survey is doing. I guess those are the best ways to keep involved.

Mr. PETERSON. I suspect we will have observers who will bring it to your attention pretty quick if things break down, Senator.

Senator TSONGAS. I think the remarks of Congressman Studds are really quite appropriate. That you people will be for all intents and purposes the decisionmakers because you will do the recommending. Everyone above you knows less about it than you do. Which means it's easy for them to make a decision, obviously. But in fact you two will be the ones who, in a very real sense, have the remarkable control over the unique fishing resources there. I just want you to understand that we understand that.

Mr. DANENBERGER. My concern with S. 2119 is that a lot of that control would be shifted. I think things tend to work better with field-type coordination activities than with Washington type.

Senator TSONGAS. I agree. You were here when there was discussion about changes in policies?

Mr. DANENBERGER. Right.

Senator TSONGAS. That is the concern. If we are always going to have an environmentalist in the White House I wouldn't be all that worried about it.

Thank you very much.

Mr. PETERSON. Thank you, Senator.

Senator TSONGAS. Mr. Calahan, Ms. Bates, and Ms. Sanfilippo. This is the environmental-industry panel. Mr. Calahan is with Texaco. Ms. Bates is with the Conservation Law Foundation, testified before us in Boston. Ms. Sanfilippo is with the Gloucester Fishermen's Wives Association, and they were unable to testify in Boston previously.

STATEMENTS OF WELDON CALAHAN, VICE PRESIDENT, TEXACO OIL CO., CHAIRMAN, AMERICAN PETROLEUM INSTITUTE, GENERAL COMMITTEE ON PRODUCTION; SARAH BATES, CONSERVATION LAW FOUNDATION; AND ANGELA SANFILIPPO, PRESIDENT, GLOUCESTER FISHERMEN'S ASSOCIATION

Mr. CALAHAN. I will file a written statement. I would like to make two comments with respect to that.

Senator TSONGAS. Let me apologize for taking so long to get to you. It's always tough to be the last panel of any congressional hearing.

Mr. CALAHAN. I have three experts with me. The first is Mr. Jay P. Simpson, a Houston consultant who is appearing with me as a representative of the American Petroleum Equipment Suppliers Association—the organization which represents those companies which manufacture and distribute drilling fluids materials.

Also with me is Dr. R. C. Ayers, Exxon Production Research Co. He is chairman of API production's task group on environmental effects of drilling fluids.

The third gentleman is Dr. Jerry Neff, associate professor, department of biology, Texas A. & M.

All three of these gentlemen have written comments which are made a part of the written testimony.¹

Senator TSONGAS. Will those gentlemen be available to discuss with staff the issues before us?

Mr. CALAHAN. Yes.

I would like to comment on article 4 of the written statement. Apart from that, just a moment to state that we have become aware that there has been widespread interest in the use of 2.1, API, both, and 13-F, oil and gas well drilling fluid chemicals to the effect that specific chemical names are not possible in many instances because drilling fluid additives are often proprietary blends.

Perhaps this could have been written more clearly to show that information of chemical composition was not available because of proprietary considerations at that time in 1976.

I would add, however, that the intent of the document was to list the major components of drilling fluids and quantities of those materials included were not detailed in their composition.

In any event under the Toxic Substances Control Act, the chemicals used in these materials have been reported to the EPA and should be available to government groups and others.

Senator TSONGAS. So what you are saying is it's not the components but rather the composition of those components that is not known?

Mr. CALAHAN. That's correct.

The original statement in 1976 made no attempt to state what the composition of each of the materials were. There are three main materials but all materials have been defined to the EPA. That information is available to the EPA.

Senator TSONGAS. The findings would be the same questions that EPA and the biological task force are going to be looking at. I take it you are comfortable that they will end up with the same conclusions?

Mr. CALAHAN. Yes.

We believe any proposal relating to produced water is premature. Some minor amounts of water may be produced through exploratory testing in the Georges bank, but significant water production will not be a consideration until 1986 or later.

It would be unfortunate to solidify now any requirement with regard to produced water without knowing what is in it. By 1986, the reinjection of produced water will have been thoroughly studied and perhaps litigated as part of the 1983 and 1985 discharge standards applicable to oil and gas operations under the Federal Water Pollution Control Act.

In other words, regulatory precedents for handling the produced water will have been established by the time any significant quantities of formation water are produced from the Georges Bank leases.

What I am saying is that the exploratory drilling phase will really involve very little produced water. You will test some forma-

¹ The statements referred to have been placed in the committee files.

tions and get a little bit of water, possibly, but it won't amount to much.

The large amount of water will come after we go into the production stage from the platforms.

Senator TSONGAS. Couldn't you structure it in such a way that perhaps that provision does not become operative unless there are particular findings? In other words, you have a trigger, absent the trigger, the provision would not apply.

Mr. CALAHAN. I think so.

Senator TSONGAS. We are trying to be reasonable on this thing, not doctrinary. But the concern is that you are right, we don't know all these things until a few years down the road, but this may be in fact your only opportunity, politically, to get some of these parameters established.

Whether they trigger later on or not may be another question.

Mr. CALAHAN. This goes to the whole question, as you are well aware. To date there has been little or no production in the Baltimore basin.

Senator TSONGAS. What about all the oil north of Georges Bank?

Mr. CALAHAN. I hope it's all there, but you really don't know until after the exploratory wells are drilled. It generally takes quite a few exploratory wells to determine if there is enough there to justify commercial production.

Senator TSONGAS. It's a function of world price.

Mr. CALAHAN. Yes, it's a function of price. Volume and price. Is it economical to produce it? This is the position we are in in the Baltimore basin today.

We have found some gas. The question is: Have we found a big enough volume of gas to make it economical to bring it to shore?

Senator TSONGAS. Let me ask you a totally hypothetical question, and I apologize in advance.

But let's say the Persian Gulf were cut off from the Western World for whatever reason, political, military, what have you. In that situation, the issue would not be world price, it would supply at any price.

Mr. CALAHAN. That's correct. I think in this period today, we have talked about 6 days' supply of oil from Georges Bank; if that were the only source of oil to this country, it would last a lot longer than 6 days, because No. 1, you couldn't distribute it in the manner we do today.

No. 2, we wouldn't be using that limited amount for some of the things we are using it for.

Senator TSONGAS. So, you could take exactly the same argument and turn it around and say that from a national security perspective, having oil in the ground is very valuable as opposed to having pumped it out and spent it on our LTD's and not having it available down the road.

Mr. CALAHAN. That might be one of the things that this country might want to consider.

Senator TSONGAS. How about if we designated Georges Bank as a strategic petroleum reserve?

Mr. CALAHAN. I would worry whether there is oil there, until after the exploratory phase.

Senator TSONGAS. Any manager who knows that of all his options, oil is by far the more diminishing, wouldn't want to argue for the husbanding of that resource and transference of your dependence to another?

Mr. CALAHAN. Of course, this is the whole reason for the government setting forth the naval reserves in Alaska, in California, for having the salt dome storage today to have strategic reserves of oil in the event some of our sources are cut off.

Senator TSONGAS. A point well taken, the administration is talking about producing up in NPR 4, which are all responsible positions.

I don't know if you have children or grandchildren.

Mr. CALAHAN. Well, I have children and grandchildren, and I am quite concerned about the energy that is going to be available to them in years to come.

Senator TSONGAS. I agree. At least we share one concern.

Why don't you continue?

Mr. CALAHAN. That is all I had to say. Be happy to answer any questions.

[The statement follows:]

STATEMENT OF L. W. CALAHAN, VICE PRESIDENT, TEXACO, INC., FOR THE
AMERICAN PETROLEUM INSTITUTE

Mr. Chairman, my name is L. W. Calahan and I am appearing here today on behalf of the American Petroleum Institute and particularly its production department which has responsibility within the institute for most matters associated with drilling fluids, drilled cuttings, and produced water. It is, of course, as a consequence of this responsibility that we appear here today to comment on S. 2119, the Georges Bank Protection Act, which deals with, among other matters, drilling discharges and produced water. Because both our oral and written comments deal primarily with drilling fluids, I have with me three experts on various aspects of those materials to assist me in responding to questions.

The first of these gentlemen is Mr. Jay P. Simpson, a Houston consultant. He is appearing with us as a representative of the Petroleum Equipment Suppliers Association—the organization which represents those companies which manufacture and distribute drilling fluids materials. The association's comments which deal with the functions of drilling fluids, how they are used and their composition, are a part of the written material which we have submitted and are marked appendix A.

Also with me is Dr. R. C. Ayers, Exxon Production Research Company. He is chairman of API Production's Task Group on Environmental Effects of Drilling Fluids and has led various other industry groups which have drilling fluids and their handling among their responsibilities. Dr. Ayers authored our comments on fate and effects of drilling discharges in the marine environment which are marked appendix B.

The third gentleman assisting me is Dr. Jerry Neff, Associate Professor in the Department of Biology at Texas A&M University. Dr. Neff is an expert in marine toxicology. He has written two books and more than 60 scientific articles on the effects of pollutants on marine animals and ecosystems. For the past 2½ years he has been investigating the effect of drilling fluid on marine organisms. Dr. Neff prepared the material which is marked appendix C in our comments and which is based on that research.

With regard to these comments, I should tell you that they became rather voluminous as a consequence of our desire to provide background material for the brief comments which I will present. The subject of drilling fluids and drilled cuttings is becoming very popular. We believe that there is considerable lack of understanding and some misrepresentation of drilling discharges. Therefore we felt it was essential to provide a rather complete basis for further discussions of the subject.

My presentation today will summarize those extensive written comments that have been filed here today. Our conclusion is that S. 2119 is unnecessary and inadvisable.

In summary, this material shows:

1. Field studies have shown little evidence of harm to marine organisms, much less to humans.

2. That rapid dilution of discharged materials reduces concentration of all mud components to at or near background levels so near to the discharge point that there is almost no opportunity for excessive exposure.

3. That solid materials which become a part of the sediments around a well pose no hazard to marine life, being largely insoluble and made up of naturally occurring materials which are already present in the sediments and are constantly being supplemented by deposition from stream and other discharges.

4. That those who suggest that they "do not know and cannot find out what is in drilling fluid" are wrong, we know what is added to the fluid at the surface, however, because materials are constantly entering the fluid system from the rock drilled from the bore hole, it is not possible to know precisely the total makeup of the fluid at any given moment.

The foregoing factors plus regulations already in place or prospective under the OCS Lands Act amendments make it unnecessary to enact new legislation which could lead to barging of drilling discharges. The proposed law would undoubtedly precipitate delays while required studies and reports were being prepared and argued to no useful purpose in the Secretary of the Interior's office. Moreover, as you have heard in other testimony here, barging is an expensive undertaking and is not without its own hazard to the environment and to the safety of men and equipment. The legislation could also reduce flexibility within the regulatory framework in such a way as to be counter productive by leading to further delay.

The investigations of drilling discharges I referenced a moment ago have concentrated on bioassay testing in the laboratory to determine toxic concentrations and dispersion testing in the field to determine the degree of exposure that exists during discharge. Many different species of marine animals indigenous to various OCS areas have been tested using representative mud systems. The bulk of the work has been on drilling muds taken from the field—those materials actually discharged—rather than laboratory muds or individual components. Some of the components react with each other when introduced into the mud system and behave differently when combined than when tested separately.

The majority of this work has been carried out in university laboratories. From this work we have learned that drilling mud toxicities are low and that while susceptibility of test animals do vary from animal to animal, the variation is not over one or two orders of magnitude using the same mud. This is true for different classes of animals and for animals taken from different areas of the OCS or from fresh water. Also, in extended testing sublethal effects have not been noted by the vast majority of investigators at low concentrations.

These laboratory studies are important indicators in assessing the toxicity of drilling discharges. Equally important, however, is the accurate determination of the concentrations of these materials that exist in the ocean during discharge. Studies ranging in complexity from observations by divers to detailed monitoring of drilling mud concentrations in the water column during discharge have been made in recent years.

These studies show that during normal drilling operations drill cuttings and the associated drilling mud separate upon discharge to the ocean. The cuttings fall quickly to the sea floor whereas the finer drilling mud particles remain in suspension and form a visible plume. Solids and trace metal concentrations fall off to background levels within a few hundred meters of the discharge source. In low energy areas, at depths below the reach of storm waves, the cuttings form piles that tend to weather away with time. In high energy areas, like the Georges Bank, the cuttings are dispersed over a shorter time frame due to bottom transport mechanisms.

Similarly when drilling mud itself is discharged directly to the ocean the bulk of the material descends rapidly. As it descends some of the finer particles separate due to turbulent mixing with the sea water and form a visible plume. This plume remains in the water column and drifts away from the discharge source with the current. Suspended solids and trace metal concentrations are typically observed to be one percent or less of their original value in the immediate vicinity of the discharge pipe. Due to continued settling and dilution, concentrations in the visible plume are observed to be 0.01-0.001 percent of the original value 100 meters downcurrent of the discharge source. Further dilution occurs rapidly and suspended solids and trace metal concentrations normally fall off to background levels within 1000 meters of the discharge source even during high rate, high volume discharges. Mud plumes are usually visible downcurrent from the point where suspended solids concentrations reach background because the large number of colloidal particles

present in mud scatter light effectively even when present in concentrations too low to significantly contribute to the weight of suspended solids. Other water quality parameters such as temperature, salinity, dissolved oxygen and pH reach background levels at distances less than 100 meters from the discharge source.

These studies tell us that dispersion takes place so rapidly upon discharge that mud concentrations in the water column are reduced to levels which will not have significant effect on marine organisms within a short distance of the discharge pipe and, during direct discharge of mud, only for a short time. It should be remembered that laboratory bioassay studies are based on a 96-hour exposure time. Thus the tests are extremely conservative when related to these intermittent discharges which only last for a few minutes. It is clear that drilling discharges have a negligible effect on ocean water quality.

We will agree that drilling discharges do have a localized effect on the benthic environment, especially in low energy areas such as the Gulf of Mexico. However, the effect is temporary and minor and physical rather than toxic in nature. These effects disappear when bottom sediments are resuspended and reworked by ocean current. We understand, too, that there is considerable disturbance and displacement of sediments from fishing operations which use dredges, cages and trawls. For all of the foregoing reasons, direct ocean disposal of drilling discharges should be permitted.

The lack of evidence of harm to the environment from actual drilling operations also suggests that new legislation is not needed.

Drilling in coastal waters began off the coast of California at the turn of this century and has since spread to Lake Maracaibo, Venezuela; the Gulf of Mexico; the Persian Gulf; and the North Sea, which have all enjoyed extensive oil and gas development activities. Some degree of offshore activity has taken place in the Canadian Arctic, off of Argentina, in the Baltimore Canyon area of the United States and in the South China Sea. After eight decades of activity, there is no convincing evidence that fisheries resources have been adversely impacted anywhere by drilling and producing operations. In the Gulf of Mexico where drilling and producing activity has been the heaviest, the fish catch has been trending upward. We do not claim credit for this increase but we do maintain that it is hard evidence that our operations have not been detrimental.

In all these worldwide offshore drilling operations, one of the few places where oil-free drilling mud and drill cuttings have had to be barged has been the State of California offshore leases, which established that requirement in 1970. However, in 1979, the California legislature approved a new law which permits disposal of clean drill cuttings and oil-free muds into waters of the state. Other testimony here has referred to this action and to a study by the state lands commission, State of California, on "the disposal at sea of cleaned drill cuttings and non-oil base drill muds from existing offshore drilling and production facilities." We commend that study to your review.

We would also like to commend to your attention a February 15, 1980 notice by Region IX of the Environmental Protection Agency that it had issued an NPDES permit for an exploratory well on tract P-0321 in the California OCS area. An attachment to the notice, "final statement of basis and response to comments—NPDES permit for OCS parcel P-0231," concludes that the NPDES permit should allow for on-site disposal of oil-free drilling muds and drill cuttings.

Until now I have devoted my comments only to drilling discharges and the provisions of S. 2119 which relate to them. Let me now turn to other provisions of the bill.

We believe that any proposal relating to produced water, and certainly one which might lead to reinjection, is premature. Some minor amounts of water may be produced during exploratory testing in the Georges Bank, but significant water production will not be a consideration until 1986 or later. It would be unfortunate to solidify now any requirement regarding produced water without knowing if it will exist and what is in it. By 1986, the reinjection of produced water will have been thoroughly considered, studied, and possibly litigated as a part of the 1983 and 1985 discharge standards applicable to oil and gas operations under the Federal Water Pollution Control Act. In other words, regulatory precedents for handling of produced water will have been established by the time any significant quantities of formation water are produced from the Georges Bank leases.

The biological task force requirement of S. 2119 appears to us to be satisfied by the biological task force already formed for the Georges Bank. There is little need for legislative action.

The requirements for expediting promulgation of the safety regulations under section 21 and the enforcement regulations under 22 of the Outer Continental Shelf

Lands Act as amended in 1978 appear to be directed at expediting actions which the Congress mandated the U.S. Coast Guard and U.S. Geological Survey to do carefully and thoroughly. There has been no evidence presented to support such haste. To the contrary, the marine board report "implementing best available and safety technologies for offshore oil and gas" does not identify any areas where special regulatory or enforcement urgency is needed.

It appears to us that with promulgation of fishermen's contingency fund regulations the similar requirement in S. 2119 is unnecessary. As a matter of fact, some companies have already been billed by the Federal Government for the first payment to the Atlantic fund.

With respect to the final requirement under section 2(b) of S. 2119 for completion and submission of the reports on at-sea spill cleanup and mitigation, this surely can be handled without having to include it in legislation.

Senator TSONGAS. Let me ask the rest of the panel to testify, then I will come back.

Ms. BATES. Thank you, Senator. I also will enter my written comments in the record and at this point summarize, in view of the time already devoted to these proceedings.

Senator TSONGAS. Your exchange and testimony at Faneuil Hall will be included.

Ms. BATES. Thank you.

Senator TSONGAS. I was more interested in the exchange that you have.

Ms. BATES. I can't promise anything colorful this afternoon, but I would like to make three points concerning S. 2119, which I believe is essential to a responsible Federal program of oil and gas development on the Georges Bank.

The first point I would like to make is that the incongruous position of the Secretary of the Interior, who at one point initiated the administrative safeguards which are the specific provisions of S. 2119, and who now appears to oppose their codification into binding statutory form, argues compellingly for congressional action if we are in fact to see these safeguards translated into substantive measures.

The second point I would like to make is that the history of the Secretary of the Interior's persistent attempts to consummate the Georges Bank lease sales argues, I think, equally compellingly for congressional action rather than for reliance upon the exercise of his discretion.

Third, I would like to make a recommendation that in order to avoid repetition of the chaos and public distrust which surrounded lease sale No. 42, that S. 2119 be expanded to include criteria for future lease sales on the Georges Bank.

In my first point, I think it's been made clear from testimony presented by the witnesses for the administration this morning that this bill is in effect one thing. It gives the force of law to an interagency agreement which was voluntarily reached between the Departments of the Interior and Commerce and the EPA, with provisions pertaining to biological task forces and disposal of certain materials.

It's important to emphasize, I think, that this agreement and the representations of the Justice Department as to its efficacy, played a critical role in the judicial decisions which in fact permitted the sale to proceed last December. And that the administrative record is replete with the assertions by agency officials that the provisions

of the agreement and of the agency compromises were essential to safe OCS operations on the Georges Bank.

Now, I think, with a remarkable degree of incongruity, we have the Secretary saying he finds distasteful congressional efforts to enact his own safeguards. I think unhappily there is only one conclusion to be drawn from these contradictory postures. That is that the provisions of the original agency agreement were never intended to be substantive safeguards. That they were intended solely to be the temporary pacifiers of Federal judges, of the public, of the State and local governments, and of the political leaders who opposed lease sale No. 42.

It seems that when expedient safeguards are implemented, and now the crisis over, tracts sold, the opportunity to elevate them to the level of statutory certitude is spurned.

Senator TSONGAS. Let me say that I sponsor the bill and support it, but I don't agree that that is where the Secretary is coming from. I have seen him in action enough on a lot of other issues, like Alaska, to name one, that I don't think that description is really—

Ms. BATES. I am not trying to generalize as to the Secretary's general record from the experience at Georges Bank.

All I am trying to suggest is that incongruity between the technical evidence and the position supported by his agency when safeguards were a matter of administrative discretion, and the reaction to the opportunity which, as you have pointed out, may be a fleeting, limited one, to enact those safeguards into statutory directives, I find very disturbing, and I find it hard to find a rational basis for it.

I think, however, that that is an area in which there may be legitimate disagreement. I think then we have to move on to the more general question as to whether or not legislation is needed, or whether on the basis of the record we ought to rely on the exercise of the Secretary's discretion.

I think in order to answer that question, we have to examine the record of agency action as it pertains to Georges Bank. The factual data relating to the marine productivity of Georges Bank, the nature of the resources to be found there, the hazardous conditions prevalent there, I think has been well established both in this and earlier hearings.

So I would like to say that it is difficult to accept the Secretary's decision to proceed with sale No. 42 as an act of discretion, and balancing, when we know that the analyses performed by Interior itself document the heavy potential for major spills, for the chronic and extensive discharge of oil, for billions of dollars of damage to the fisheries and even for commercial extension of several of Georges Banks stocks. And when we know the Department of Commerce, which is responsible for fisheries management, last summer characterized the projections of its sister agency as, and I quote, "an extreme underestimate." And when we know that now that lease sale No. 42 has been held, that within days of that sale, the call for nomination for lease sale No. 52 was announced, containing as was pointed out this morning, every single tract deleted from the first sale.

I think it becomes obvious that in this particular arena, the exercise of the discretion of the Secretary of the Interior has in fact amounted to a single-minded determination to proceed on Georges Bank according to an administrative schedule. And that however well intentioned the Secretary's efforts have been to preserve his own administrative prerogatives, that they have in fact skewed the entire array of statutory protections and requirements that affect the OCS leasing program.

As was pointed out in the opening remarks this morning, there are a number of statutes which affect the decision to proceed in the OCS. Congress has never made in any statute, or in the statutes taken together, the determination that every square foot of the OCS must be leased and that it must be leased immediately.

I would submit that the balancing of competing values mandated by the 1978 amendments to the Outer Continental Shelf Lands Act, and so laboriously struggled over by Congress, has not informed the decisions pertaining to the Georges Bank. Indeed, all of the regulations, including the essential best available and safest technology regulations, required by that statute are not at this date promulgated.

I would say the national goal of restoring our offshore fisheries, articulated by the Fishery Conservation and Management Act, has not featured in his calculus. The scope of reasoned analysis of alternatives required by the National Environmental Policy Act has never been achieved by him. He has dismissed the priorities unequivocally established by the Endangered Species Act with disingenuous statements and representations. That the management alternatives made possible by the Marine Sanctuaries Act have been quashed. There has been categorical refusal to examine the relevance of unforeseen and problematical incidents, such as the disastrous Campeche oil spill.

I am afraid the unfortunate conclusion of an examination of the record is that there is no remotely plausible reason to invest our trust in his discretion rather than Congress, now.

I think in reference to Heather Ross's remark that we give peace a chance, that it's very important to point out that peace does not exist in the context of OCS operations on the Georges Bank now; and that as in the past, the fruits of the Secretary's endeavors will not be the orderly development of OCS resources in the North Atlantic, but a collision course with the local, State, regional, and national interests committed to fisheries conservation and management. It is therefore entirely appropriate for the Congress to intercede and to chart a far more constructive course for OCS development on Georges Bank.

That brings me to my third and final recommendation. That is that the bill be expanded to pertain to the holding of future sales so that we can avoid the conflicts and confusion which surrounded this sale at every level, at every step of the way, and which I do not believe are over yet.

I would recommend four prerequisites for future sales on the Georges Bank area. First, that no further lease sales take place until at least 5 years of operating experience in the development phase of sale No. 42 tracts have been assessed by an independent, blue ribbon scientific panel. This pertains solely to the Georges

Bank area, in my opinion. Second, that no future lease sales take place until a full-scale investigation into the causes of the Campeche oil spill has been completed and its finding published. Third, that no further lease sales occur until there is a comprehensive oil spill clean-up program, and the required equipment and vessels are in place in New England. And last, that the technical analyses mandated by conditions one and two above, and the costs of condition three above be articulated and incorporated into the decision to proceed or not to proceed on Georges Bank.

I would emphasize that the benefits are substantial, whereas the cost of caution is minimal at this point. During the litigation pertaining to lease sale No. 42, the Department of Justice, on behalf of the Secretary, reiterated time and time again that sale No. 42 contained the most promising tracts from a hydrocarbon perspective, and the least risky from a point of hazard to the general environment of the Georges Bank fishery. So that therefore, I feel that we have taken the major step toward an analysis of the resources on the Georges Bank, and we ought not proceed imprudently and uncautiously in exploring areas that are both less safe and less promising.

That ends my general remarks. I would just mention that I have appended my technical comments to my written testimony. And once again I would like to thank you for the opportunity to appear before you, and welcome the opportunity to answer any questions you might have.

[The statement follows:]

STATEMENT OF SARAH M. BATES, ATTORNEY, CONSERVATION LAW FOUNDATION OF
NEW ENGLAND

Messrs. Chairmen, members of the Senate Committee on Commerce, Science and Transportation and of the Committee on Energy and Natural Resources, thank you for the opportunity to appear here before you today to testify on S. 2119, a bill to protect the fisheries resources on Georges Bank. My name is Sarah Bates and I am an attorney with the Conservation Law Foundation of New England, known as CLF. CLF is a public-interest, environmental law organization based in Boston. Over the past several years, we have been deeply engaged in legal efforts to conserve the Georges Bank fisheries.

I believe that S. 2119 is essential to a responsible federal program of oil and gas development on the Georges Bank. My testimony will cover three aspects of the bill. First, that the Department of the Interior's own administrative safeguards parallel the specific provisions of the bill and amply demonstrate their propriety. Secondly, that the Secretary of the Interior's persistent attempts to consummate the Georges Bank lease sales have made congressional intervention imperative. Thirdly, that the bill ought to be expanded to include criteria for subsequent OCS sales on Georges Bank in order to avoid repetition of the chaos and public distrust surrounding the Lease Sale 42.

In essence, this bill gives the force of law to an interagency administrative agreement voluntarily reached last fall between the Departments of the Interior and Commerce and the Environmental Protection Agency. As does S. 2119, the agency agreement pertained to the formation of a Biological Task Force, to oversee operations on the Georges Bank, and the barging of drilling muds and the reinjection of formation waters by OCS operators in that area of the North Atlantic.

The principal signatories at Interior and Commerce have repeatedly characterized this agreement as vital to Lease Sale 42. Before the press, before the courts, they cited to its measures as insurance that Georges Bank would be offered the special safeguards its environment required. The Department of the Interior is the original proponent of these particular safeguards and, heretofore, has heralded them as innovations vital to the proper conduct of Outer Continental Shelf (OCS) activity on the Georges Bank.

The administrative record is replete with the Secretary of the Interior's assertions that the provisions now entailed in S. 2119 are key to safe OCS operations on Georges Bank. The interagency agreement and the representations of the Justice Department as to its efficacy played a critical role in the judicial decisions permitting Lease Sale 42 to be held on December 18, 1979. Thus, the technical basis and policy initiatives supporting the requirements of S. 2119 have been well established by the responsible officials in the Departments of the Interior and Commerce.

Regardless of the oft-proclaimed benefits of the interagency agreement, its legal authority is tenuous at best and there are no guarantees that it will endure as long as OCS operations on Georges Bank. Therefore, it appears only logical to raise the provisions of this memorandum from the level of administrative discretion to the level of statutory certitude.

Anomalously, the Secretary of the Interior finds distasteful congressional efforts to enact his own safeguards. On the one hand, Mr. Andrus has publicly applauded this agreement, and cast it as the basis for proceeding with Lease Sale 42 and, on the other, he opposes giving it the force of federal law. Only one conclusion can be drawn from such contradictory postures: the provisions contained in the original memorandum were never intended by the Secretary to be substantive safeguards. One is forced to infer that they were solely intended to be temporary pacifiers for the federal courts, the public, the state and local governments, and the political leaders who opposed Lease Sale 42. Now that the sale has been held and tracts sold, the opportunity for statutorily certain protection is spurned, not welcomed.

The Secretary's position on S. 2119 argues compellingly for congressional action. When expedient, he instituted administrative safeguards and now, the crisis over, he objects to codifying them into binding statutory directives. The preservation of the Secretary's autonomy rather than the preservation of vital national resources is clearly his priority, and it must be rejected by Congress.

The need for specific provisions of the bill has been amply presented by the Departments of the Interior and Commerce. Moving to a more general question, it is clear that legislation is needed because, based on the Secretary's past conduct, one cannot rely on the exercise of his discretion to implement administratively those safeguards contained in S. 2119. The record gives scant support for this proposition.

The Georges Bank is a shoal area southeast of Massachusetts. It comprises approximately 20,000 square miles, an infinitesimal speck in the earth's oceans. And yet, Georges Bank sustains one of the world's most prolific and diverse fisheries, producing more fish on a per acre basis than any other area on this planet. Georges Bank supplies about 17% of the food fish landed in the United States and is of immediate and great economic importance to New England. Multi-national fleets fish the Georges Bank and its harvest is distributed among many different nations and peoples.

A unique confluence of circumstances accounts for the literally incalculable biological wealth of the Georges Bank. There, the Gulf and Labrador Currents coincide and are joined by the tidal currents which sweep the Gulf of Maine. Sunlight penetrates through the shallow depths of the Bank, where breaking water is not uncommon. Turbulence throughout the water column and rapidly moving bottom sediments constantly make mineral nutrients available to marine life. The result is a circular gyre which keeps nutrients, fish stocks, their spawn and larvae in the highly favorably environment of the Bank and which, thereby, sustains one of the most productive ecosystems known.

The very conditions which make Georges Bank the biological treasure it is, also make it extremely vulnerable. Its pattern of currents means that pollutants, such as oil, and drilling fluids and muds, will be kept circulating and recirculating throughout the Bank, degrading habitat and destroying biological populations. Its constant turbulence means that toxic substances will be mixed throughout the water column and will stand every chance of contaminating bottom sediments as well. The hazardous nature of its seas and weather make nautical catastrophes inevitable, as indeed they have plagued the Georges Bank for centuries.

The Georges Bank in all its abundance is as yet unimpaired. What then is the nature of estimated oil and gas resources which impelled the Secretary of the Interior to hold Lease Sale 42? 123,000,000 barrels of oil, slightly more than 6 days' national demand.

Was the significance of the fishery unknow to him; were the risks uncalculated? No. The analyses performed by Interior itself document the heavy potential for major spills, for extensive chronic discharge of oil, for billions of dollars of damage to the fisheries, and for the commercial extinction of several Georges Bank stocks. The Department of Commerce, which is responsible for fisheries management, last

summer characterized the projections of its sister agency as "extreme underestimate[s]."

Now that Lease Sale 42 has been held, is Interior moving cautiously on Georges Bank? No. The lease sale was held on December 18, 1979; by the end of the month, the call for nominations for the next sale had been announced.

It is all too obvious that the discretion of the Secretary of the Interior in fact amounts to nothing more than a single minded determination to proceed at all costs with OCS activities on Georges Bank. However well-intentioned the Secretary's efforts to preserve his own administrative prerogatives have been, they have in sum skewed the entire array of statutory requirements affecting OCS leasing.

The balancing of competing values mandated by the 1978 Amendments to the Outer Continental Shelf Lands Act and so laboriously struggled over by Congress has not informed his action. Indeed, he has not even implemented all the regulations required by that statute. The national goal of restoring our off-shore fisheries, articulated by the Fishery Conservation and Management Act, has not featured in his calculus. The scope of reasoned analysis of alternatives required by the National Environmental Policy Act has never been achieved by him. He has dismissed the priorities unequivocally established by the Endangered Species Act with disingenuous lip service. The management alternatives made possible by the Marine Sanctuaries Act have been quashed. He has categorically refused to examine the relevance of unforeseen and problematical incidents, such as the disastrous Campeche oil spill. The record provides us with no remotely plausible reason to trust the Secretary's discretion now.

As in the past, the fruits of the Secretary's endeavors will not be the orderly development of OCS resources in the North Atlantic but a collision course with the local, state, regional and national interests committed to fisheries conservation and management. It is therefore entirely appropriate for the Congress to intercede and to chart a far more constructive course for OCS development on Georges Bank, not only in the management of Sale 42 tracts, but also in the conduct of future sales.

I would recommend that S. 2119 be expanded to include four prerequisites for any future Georges Bank lease sale, not necessarily for all North Atlantic lease sales, but certainly for Georges Bank lease sales. First, that no further lease sales take place until at least five years of operating experience in the development phase of Sale 42 tracts have been assessed by an independent, blue ribbon scientific panel. Second, that no future lease sales take place until a full-scale investigation into the causes of the Campeche oil spill has been completed and its findings published. Third, that no further lease sales occur until there is a comprehensive oil spill clean-up program and the required equipment and vessels are in place in New England. And, lastly, that the technical analyses mandated by conditions one and two above and the costs of condition three above be articulated and incorporated into the Secretary's decision to proceed or not to proceed on Georges Bank.

In closing, I would like to emphasize the need for Congressional action. At hearings held in Boston last month by Senators Tsongas and Weicker, the question was asked, who has been listened to in the decision to proceed on Georges Bank? I do not know the answer to that question. I do know that the voice of reason has not been heeded; that the voice of harmony among federal agencies has not been heard; that the voice of unity between federal and state and local governments has not been acknowledge; that the voice of stewardship has not been followed; that the voices of those who fish and of those who are needy for protein have been drowned out. If those voices are to be heard they must emanate from the Congress of the United States.

We in New England have truned to many in the federal government over the past years to save the Georges Bank fishery. Those in the Commerce Department with the authority to manage Georges Bank as a fishery first and an oil field second have declined to do so. Those in the Interior Department with the authority to balance the value of living marine resources against probable finds of oil and gas on Georges Bank have declined to do so. Those in the Executive office with the authority to intervene have declined to do so.

The bill before you today is the first step towards responsible and intelligent federal action on Georges Bank. We urge you to take it, to take it so that these fisheries may flourish to the benefit of mankind long after the last drop of oil extracted from Georges Bank has been burned.

I have appended my technical comments on the S. 2119 to these remarks and thank you again for the opportunity to testify before you.

Appendix I—Technical Changes Recommended for S. 2119

- (1) Sec. 2.(a)(1): " , in conjunction with," be changed to, "with the approval of."

(2) Sec. 2.(a)(1): "determines" to "determine".

(3) Sec. 2.(a)(2): "in conjunction with", be changed to, "with the approval of".

(4) Sec. 2.(a)(3)(B)(i) and (ii) be deleted and the following substituted:

(i) such recommendations should not be implemented because they are incompatible with an overriding national interest; or

(ii) specific alternative measures have been implemented providing protection of biological populations on the Georges Bank equivalent to that afforded by such recommendation.

(5) Sec. 2.(a)(4) and Sec. 2(b) include specific timetables for the discharge of the Secretary's responsibilities.

(6) That Sec. 2(c) be added as follows:

2(c) Nothing contained in this act shall reduce existing environmental standards governing federal agency action, including those established by the National Environmental Policy Act, the Clean Water Act, or the Endangered Species Act or limit the authority of agencies other than the Department of the Interior to enforce environmental standards on Georges Bank.

Senator TSONGAS. How do you answer the comments of Mr. Sneed that disposing of drilling muds on shores, out of the frying pan and into the fire?

Ms. BATES. As I am sure Mr. Sneed would be the first to point out, I am a lawyer, not a scientist. I cannot answer that from a technical standpoint.

I would say the problem we face across this country is one of the closing circle, of the dangerous substances we use in our lives and which we have to learn how to dispose of. Saying that it's unsafe to dispose of them on land, but it's easier to dump them out of sight on Georges Bank, I don't think is sensible.

If those drilling muds contain toxic substances that present serious problems, I would say we have to solve those problems whether we use ocean sites approved by EPA, and not in productive areas such as Georges Bank, whether we use a land based system, or whether we feature disposal in the calculus of whether or not to proceed in marine environments that are highly productive, but which do not seem to have a great resource potential.

Senator TSONGAS. Is that argument taking the drilling muds out someplace?

Ms. BATES. That I believe is a argument put forth by NOAA. The oceans, as I think is clear, are not uniform in terms of their biological importance. There are vast stretches of the oceans which are in terms of biological productivity comparable to deserts on land-base forms.

Senator TSONGAS. Like where?

Ms. BATES. I would say off the Continental Shelf, for instance, there are areas which appear as you look at the graph of fisheries production, of plankton production, and so on. We see brilliantly productive areas such as Georges Bank, and a few other areas and here are areas where there is very little biological productivity. I think saying something is problematical to bring to land, therefore requires dumping at sea, is not the long-term solution to the problems that face us.

Senator TSONGAS. Thank you. Is Peggy Sibley with you?

Ms. SANFILIPPO. No. I was called to come.

Senator TSONGAS. Why don't you proceed?

Ms. SANFILIPPO. Senator, I wanted to thank you for giving us the opportunity to come down and testify. I am president of the Gloucester Fishermen's Wives Association. I want to start off by saying

what the Georges Bank means and what it is for us, the people of Gloucester, especially.

Senator TSONGAS. Let me say that you are the only person who's testified who is not either from an oil company, government agency or environmental group.

Ms. SANFILIPPO. No, I am from those people who make their living and can provide the food supply for this country and part of this world that comes from Georges Bank. The fishermen of Gloucester fished the Georges Bank for the past 350 years. It's been proven to be a very productive fishing ground.

As you recall, the whole world came to Georges Bank to fish until the passage of the 200-mile limit. We are looking for perfect safeguards that will tell us we are not hurt, we will continue providing what has been provided for the past 350 years. In searching for this answer, we have not found it yet.

As I said, we do fish on Georges Bank. According to the reports, it is very dangerous to them. There is a part of the bank where many times, even summertimes, fishermen will never travel because of the sandy shoals in bad weather conditions. They go around the bank in order to come home, because it's very dangerous for them to come over. Yet they keep on taking those risks in order to make a living for themselves, and to bring the food of fish that is so much needed in this country and around the world.

Since the passage of the 200-mile limit, our fishing industry has really come to a better livelihood, because it's proven that when the foreign fleet left, the private take of fish has increased very much. So we have a very up-to-date industry that we did not have before. Then a large amount, millions of dollars have gone into the industry. We are expecting another vessel will cost between a half to a million dollars.

These boats do fish on Georges Bank. On those same grounds where some of these lease sales are supposed to take place.

Senator TSONGAS. These boats are in Gloucester?

Ms. SANFILIPPO. These boats are in Gloucester. We just got two 3 weeks ago. Each cost \$900,000.

Senator TSONGAS. Who owns the boats?

Ms. SANFILIPPO. Well, it's owned by fishermen and their family or corporation.

Senator TSONGAS. Are they local?

Ms. SANFILIPPO. They are local people, yes. People who themselves have fished on Georges for 30, 35 years. As I said, we are willing, more than just money, it's the livelihood. There is so much needed. According to the bylaws of Gloucester, they cannot meet the demands they have for fresh food fish, the only natural protein that is left in this world.

Senator TSONGAS. Who finances the boats?

Ms. SANFILIPPO. Most of those, before last May some of those boats were financed by the Government loan under the Fisheries Service.

Senator TSONGAS. Which banks are working with them, the local banks, Boston banks?

Ms. SANFILIPPO. No, as far as I know, it's the Gloucester banks.

Senator TSONGAS. Thank you.

Ms. SANFILIPPO. I want to go on with the testimony.

Senator TSONGAS. I will keep quiet until you finish.

Ms. SANFILIPPO. We have been a long time involved in this. My first knowledge of this came in November of 1977, during the Fishery Management Council, when President Carter himself wanted a marine sanctuary established on Georges Bank. The knowledge of what a marine sanctuary was at the time. We didn't pay too much attention to it. Some people just told us, if there is a sanctuary, you cannot fish there anymore. That really scared us. I am very sorry to say that I didn't know what a marine sanctuary was at the time.

Right now in Gloucester we have a problem. We have plenty of boats from Texas fishing in Gloucester. We are expecting another 80 boats more. The question is, since the Campeche Bay spill, there is much around there. So they come and visit us in Gloucester. We have made room for them, as we understand they have to make a livelihood like us, and they have problems, in the same position we would be if anything would happen to Georges Bank.

Around 70 percent of this country's food fish comes from Georges Bank, Gloucester, and New Bedford is providing that. We are talking about a food shortage. Right now we think there is an energy shortage. Many times we have been questioned. They say you are selfish. You don't want any drilling in Georges Bank. Your boats have to go fishing.

Well, we are providing food. And we are responsible to the American people to provide them with that type of food and probably to the world, because you know there are species on Georges Bay that the American people don't eat, but they are valuable to the sea. Those are very delicate type of fish such as whiting, squid, herring, mackerel. We have to teach the people to eat them. We hope to do that in the future. All these fish spawn in Georges Bank.

The other thing I want to bring up is that as we have traveled to this situation of oil drilling in Georges Bank, we have called many Government agencies, many State agencies, and the response is very strange. In one case we called the White House, and we talked with the office of Stuart Eizenstat. And we told him, "Please, we would like to talk to you regarding Georges Bank." They say, "Yes, hold on a minute." We were on hold for 20 minutes. When they came back, they say, "Well, you should call the Treasury Department. We do not handle finance over here."

These are some of the experiences. I am so happy to see that this is not what Georges Bank is all about, because over there they thought we were talking about some kind of bank.

Yes, Georges Bank is a bank and a big one too, because it provides so much for us and for this country.

As a fisherman's wife and Gloucester person, I make the recommendation that there be a congressional—where they could put an end to what is going to go on in Georges Bank. They could really supervise. I have been very much disturbed today in hearing that nobody seems to know the effect the drilling is going to have.

The manager came to Gloucester to visit us, and when we got to the subject, he said, "Yes, the drilling muds are poisonous to the environment." Yet over there, yes, it would be dangerous to the spawning of the fish and other things.

He kept saying, "Why should you worry about an oil spill. If 10 of our boats go down—oil spill. Within a week we lost the best fishing boat in Gloucester. When there was the most perfect condition of weather on the Bank, the Coast Guard reported 5-foot waves. The boat went down in 7 minutes. Nobody knew why, even after a vessel was taken. Last month another vessel, 2½ years old went down in Georges Bank. There were 8-foot waves.

The Coast Guard would never go and search for those people, but we were lucky. Many hours before another boat called in for help that was taking in water and the Coast Guard was in the Bay. They rescued the men. An 80-foot wave on a February night. The men were rescued, thank God.

A total of 10,000 men have lost their lives on Georges Bank. So it is a livelihood for us, but also a cemetery, a cemetery of our men, in a sense. We want it to be taken care of right, because we don't want to tell our children or grandchildren that we didn't care, and the place where their father, grandfather are buried, now just lies there with all these things that are going to destroy it.

This is why we recommend the Congress should do something to protect it.

I think I have covered most of this. But keep in mind we are producing food, and we are not selfish in trying to delay it until the day when oil could be taken in a safe way, and we could enjoy the luxury of enjoying both resources—fish and oil.

If that cannot be done at this time, please, nobody take it away from us. We could take it in the future. Science gets better every single day. The day may come when science will say, "Yes, we will take oil from Georges Bank and the fish will not be ruined."

Thank you for this opportunity.

Senator TSONGAS. There is a rule in the Congress about being eloquent without a written statement.

Ms. SANFILIPPO. We usually never have written statements.

Senator TSONGAS. I would hate to run against you after that. I take it you don't agree with the ad?

Ms. SANFILIPPO. No; we have had experience too. Many little towns around Gloucester have been having little conferences, and we say, "Why are they visiting." And they tell how good it's going to be for them, how cheap the oil is going to be. It's going to make them much more comfortable. We are much aware that that is a natural resource, and we have to share with the rest of the country just like we are sharing the fish with the rest of the country.

Senator TSONGAS. I think the point to be made in that, that oil will eventually be produced.

Ms. SANFILIPPO. Yes.

Senator TSONGAS. The question is, for obvious pressures that are on the American people, the question is whether in the course of that production we lose the other resource. It basically comes down to economics, because you can have the safeguards. It's just going to cost you money. What it comes down to is whether we are willing to pay that price.

Ms. SANFILIPPO. Yes. That should be a real big concern, because we do at the present time, fisheries are a very valuable resource too. Moneywise, furnishing the people with that type of food that is so much needed in this country and around the world.

And I want to say something else. The fisherman is always the one paying the price at the end. We screamed and came here in order for the passage of the 200-mile limit. We got it many years after we asked for it. After the foreign fleet left, now the fishermen have paid the price. For the past 2 years the fishermen have been told to fish on a quota basis, so that the fish stay on and spawn for the generation to come, that we do not destroy the fisheries.

It's been hard for the fishermen to accept that, but they are getting convinced, and they are thinking to meet those requirements at their own costs. So if anything happens, if oil spills and destroys the stock, the New England Regional Council within the 200-mile limit and Department of NOAA has the full power of stopping the fishermen from fishing so that the few fish that are left could spawn for the generation to come.

So we always end up paying the price for the mistakes that are made, because we cannot wait. We have to have it now. Their oil is in reserve and will keep very well in the Georges Bank.

Senator TSONGAS. Mr. Calahan, how long do you think—if some of the projections are correct as to what may indeed be out there, drilling, exploration, and production of Georges Bank would encompass how long a period of time?

I mean there will obviously be tertiary and secondary recovery.

Mr. CALAHAN. Let me give you an example. Drilling started in the Baltimore Basin in February 1978. If Texaco and its coowners are successful in delineating a deposit that is commercial, it will be another 2 years before we get a platform onsite. Then, say, it's a 20-well platform, 24-well platform. To drill those 24 wells will probably take another 4 or 5 years. So we are looking at the time difference between 1978 and about, oh, 8 years later, 1986, something of that nature. We have not yet started drilling on Georges Bank. If someone is successful, and again, depending on whether or not they can delineate a commercial deposit of oil or gas with a relatively few wells, it will take about the same period of time on Georges Bank. About 8 years.

Senator TSONGAS. Do you agree with my thesis that the issue is one of cost, and just a question of whether that cost is worth it?

Mr. CALAHAN. Well, I was impressed by one of the things that the lady from Gloucester said, when she said that 3,000 lives had been lost—

Ms. SANFILIPPO. 10,000.

Mr. CALAHAN. Gosh, I think she would welcome some platforms or drilling rigs that might save a few lives each year. This certainly happens in the Gulf of Mexico. I suppose hardly a week goes by that some brave fisherman doesn't find himself in trouble in the Gulf of Mexico and seeks a haven on one of the rigs or one of the platforms.

Ms. SANFILIPPO. I would like to respond to that. When our men were lost in Georges Bank, there hasn't been a trace of the vessel or the men. We lost two on September 1978. They were on Georges Bank fishing. They radioed to the next boat. The boat never came home. Nobody never knew what happened to it. Within a week, the same thing. There is no trace of those boats. They go down, so that it's just unbelievable.

Senator TSONGAS. Let me—I don't have questions for you to be submitted and responded to in writing, but just one question, Mr. Calahan, and this is not a question, it's more of a comment. One of the reasons that your industry meets with such—not opposition, but some skepticism and this constant buffeting between the industry and Members of Congress, some of us—obviously, there are those who engage in diatribes against the oil industry, because it's politically attractive. And I have no respect for that approach as a gender. But the problem for some of us is that if you look at the long-term engineering needs of the country, there is no way that you can obviate the need for conservation of renewables. We see the industry basically as selling the more production approach. That we can produce our way out of a dilemma by producing more of a finite resource. I think that is intellectually very difficult to come to grips with.

I think, and you can take this back with you, if you want or if you don't want, but if the industry as a whole, rather than doing this kind of thing, which is inflammatory, and I think irresponsible, were willing to embrace a rather comprehensive approach and were to proceed to the forefront of conservation, renewables, for example, the Harvard Business School report and Carnegie Foundation report and others have advocated, that a lot of other things industry is looking for would be far more acceptable, because they would be perceived as within a framework which we would understand to be intellectually justifiable, as opposed to the basically "Drain America First" approach that more production by definition entails.

So it's not for some of us a question of being anti-oil industry. I think you people happen to do a reasonably good job on what you do. It's just the question that I cannot go back home to my kids and explain to them, and your grandchildren, how their world is going to be any more secure if we adopt this more-production scenario.

Mr. CALAHAN. Sir, I can answer that by saying that my company, and I am sure there are others that follow the same course, we are doing all that we feel that we can to conserve energy. We have made quite a program of listing those places where we utilize energy and making a study of how we can lessen our use of energy throughout our entire operations. We are actively pursuing that course.

Senator TSONGAS. I completely agree. I am quite aware of that. In that sense, what you are doing is very commendable. I am talking about the exposure you have to the American mind set, and the use of that access not to argue conservation and renewables while we get in place the various things we are talking about here, but the use of that for this kind of message which I would argue with you is inconsistent with an era of limited finite and diminishing resources.

This is not the time or place to argue it. But I just would hope that at some point there would be an understanding by the industry that there are, at least in the Congress, those who respect the industry for its capabilities, and I think a remarkably good job in producing the resource, but would argue for a more comprehensive approach, or at least to give the public impression of an understanding of that approach.

I don't mean this as a criticism. I am just trying to be, to give you an idea where some of us are coming from.

Thank you very much for coming.

[Information to be furnished.]

[Whereupon, at 1:15 p.m., the hearing was adjourned.]

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