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Outer Continental Shelf Sale 40: Inadequate Data Used to Select and Evaluate Lands to Lease. EMD-77-51; B-118678. June 28, 1977. 42 pp. + 7 appendices (11 pp.).

Report to the Congress; by Elmer B. Staats, Comptroller General.

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Authority: Outer Continental Shelf Lands Act (43 U.S.C. 1331). S. 9 (95th Cong.). H.R. 1614 (95th Cong.).

The Department of Interior's policy of leasing Outer Continental Shelf (OCS) lands that have not been properly evaluated because of insufficient data has led to problems. Findings/Conclusions: A review of Sale 40 indicated that the Department had insufficient data with which to value the tracts. There was only one deep stratigraphic test off-structure for Sale 40. The reliability rating showed that only one of the three major parameters for resource evaluation could be identified by seismic data. A number of tracts (49%) received only one or two bids each. The differences in values assigned by the Department and by industry to the minimum valued tracts leased differed by an average of almost 2,000%. Recommendations: The Secretary of the Interior should direct a geological exploration program to develop and implement a plan for appraising OCS oil and gas resources, and then encourage industry to drill with information shared with Interior on a confidential basis. If any data are still needed, Interior should take necessary actions, including public financing of stratigraphic drilling, to obtain it; offer for lease only those areas adequately assessed; and determine whether it is in the national interest to have prelease exploration be either on-structure or off-structure. Congress should favorably consider pending legislation on OCS leasing. (DJM)

REPORT TO THE CONGRESS

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

Outer Continental Shelf Sale 40 --Inadequate Data Used To Select And Evaluate Lands To Lease

Department of the Interior

The Interior Department selected Outer Continental Shelf oil and gas tracts for leasing without obtaining enough information to determine their potential resources. Similar problems were discussed in GAO's report on Outer Continental Shelf Sale 35.

Overall, industry bidding was greater in Sale 40 than Sale 35. The larger amount of money bid in Sale 40, however, gives no assurance that the best areas were offered or that energy resources will be found.

Interior should direct an exploration program to develop and implement a plan for appraising Outer Continental Shelf Oil and gas resources.

EMD-77-51

JUNE 28, 1977

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-118678

To the President of the Senate and the
Speaker of the House of Representatives

This report describes how the United States selects and evaluates Outer Continental Shelf lands for leasing to develop domestic oil and natural gas resources and suggest ways to improve this Federal program.

This review was initiated at the requests of Congressman Hamilton Fish, Jr. and Senator Clifford P. Hansen and under the authority of the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Secretary of the Interior; the Director, Office of Management and Budget; Congressman Hamilton Fish, Jr.; Senator Clifford P. Hansen and the House and Senate committees and subcommittees having oversight responsibilities for the matters discussed in this report.

Sincerely yours,

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

OUTER CONTINENTAL SHELF SALE 40--INADEQUATE DATA USED TO SELECT AND EVALUATE LANDS TO LEASE

D I G E S T

More and more the Nation is relying on the Outer Continental Shelf leasing program as a way to increase our domestic oil and natural gas production. Decisions on where to lease and at what rate will greatly affect whether the Nation can decrease its reliance on foreign energy supplies and have enough energy resources to meet near-term needs.

The Department of Interior's policy of leasing Outer Continental Shelf lands that have not been properly evaluated (because of insufficient data) encourages industry to speculate in lands believed to contain no or minimal resources and does not guarantee that the Government receives the fair market value for these leased resources.

To prevent this, the leasing program should be designed to offer the best acreage after it has been adequately explored for resources.

In Sale 40, held on August 17, 1976, 154 oil and gas tracts were offered for lease off the coast of Delaware, Maryland, and New Jersey (called the Baltimore Canyon). The tracts were offered to the highest industry bidders, who are required to develop tracts for oil and gas. The bonus revenues received from the leased tracts were about $1.1 billion. (Bonus revenues are initial payments at time of lease, apart from the percent of production payments the Government later receives.)

SELECTING AND EVALUATING TRACTS

Interior selected tracts for lease after reviewing limited and insufficient data and before assessing the true resource development potential of the land. (See pp. 12 and 20.)

Before actual sale, each tract is assigned an evaluation of its worth to determine the acceptability of industry bids and to help assure the Government receives a fair market value return for the lease of public resources.

As with Sale 35, Sale 40 evaluations were unreliable--made without enough data. Interior had less overall information to use in evaluating Sale 40 than it did for Sale 35. (See p. 22.)

INDUSTRY BONUS BIDDING

The best measure of a sale's success is not the total bonus dollars received from holding a sale but the ultimate discovery and production of oil and natural gas.

For example, the total bonus revenues received from Sale 32 in 1973 were about $1.5 billion, but resources have not yet been found. The resource potential of the Sale 32 area is questionable. Getting more geologic knowledge before a sale may reduce industry's willingness to pay high bonuses, but it will provide better knowledge of the resource potential and aid in selecting areas to be leased.

AGENCY COMMENTS

Because of the need to issue the report before passage of pending Outer Continental Shelf legislation, the Department was unable to formally comment in writing within the given timeframe. GAO did, however, discuss the report's recommendations with Department officials. These officials told GAO that the Department's views on the recommendations in the Sale 35 report as stated in the June 13, 1977, letter from the Under Secretary of the Interior to Chairman Ribicoff, Senate Committee on Government Operations could be considered representative of their views on GAO's recommendations in this report. (See app. V.)

RECOMMENDATIONS TO THE SECRETARY OF THE INTERIOR

The Secretary of the Interior should direct a geological exploration program which has a systematic plan for appraising Outer Continental Shelf oil and gas resources, including selected stratigraphic test drilling. The plan should identify the level of stratigraphic drilling necessary to provide a minimal level of data on major shelf areas.

After the plan has been developed, the Secretary should encourage private industry to explore areas identified in the plan and confidentially share with Interior the information developed. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafide potential bidders to "buy-in" on the exploration by equally sharing the cost of the drilling.

After Interior knows what land industry has explored and how thoroughly it was explored, if any data is still needed, the Department of the Interior should take necessary actions, including public financing of stratigraphic drilling, to obtain it.

In addition, after the tracts have been selected the process outlined above should be repeated to obtain more reliable data for prelease evaluation purposes if deemed necessary.

Interior's Geological Survey and Bureau of Land Management should be required to consider all necessary information and to make final corrections to tract values before lease. Then, the Department should offer for lease only those areas for which it has collected and analyzed sufficient information to adequately identify where the resources are, their estimated value, and potential for development in the near future.

RECOMMENDATION TO THE CONGRESS

In March 1977 GAO testified before the House Ad Hoc Select Committee on the Outer Continental Shelf and the Senate Committee on Energy and Natural Resources that the recommendations in GAO's report on Sale 35 were generally in line with bills before the 95th Congress (S.9 and H.R. 1614).

Review of Sale 40 has provided additional support that more geologic data is needed to reduce the risk associated with Outer Continental Shelf resources development. Consequently, the Congress should favorably consider the pending legislation.

Contents

ABBREVIATIONS

AEOT	Average Evaluation of Tract
Bureau	Bureau of Land Management
Department	Department of the Interior
GAO	General Accounting Office
MROV	Mean Range of Values
OCS	Outer Continental Shelf
OMB	Office of Management and Budget
Survey	Geological Survey

GLOSSARY

Electric log	An electrical survey of an uncased hole which reflects the resistivity of rock strata to electrical current and the spontaneous potential of the rock. From the resistivity curve, geologists can determine the nature of the rock strata surveyed.
Geochemical	That branch of chemistry dealing with the chemical composition of the earth's crust and the chemical changes that occur in the crust.
Geological data	Any information necessary for a study of the crust of the earth. A petroleum geologist is primarily concerned with sedimentary rocks which produce the world's oil.
Interpretation	The expression of a geologist's conception of what geophysical stratigraphic and related exploration data means as to the possible entrapment of oil and gas.
Magnetometer	A device that measures the relative intensity of the earth's magnetic effect. It is especially useful where salt or igneous or metamorphic rock is responsible for the subsurface structure, if any.
Seismograph (seismic) survey	The plan of employing devices which record the vibrations of the earth. As used in the oil industry, seismograph surveys record shock waves. By obtaining the time interval between the reflected and refracted shock, geophysicists can approximate the underground structure. From this data the geophysicists prepare a contour map indicating the presence of structural traps (if any) in the subsurface.

Stratigraphic trap	A reservoir capable of holding oil or gas. It is formed by a change in the character of reservoir rock from a break in its continuity. For example, the loss of porosity and permeability in a tight sandstone updip forms a stratigraphic trap. Such a trap is much harder to locate than a structural trap because it is not readily revealed by geological or geographical surveys.
Structural trap	A reservoir capable of holding oil or gas, formed from crustal movements in the earth that fold or fracture rock strata in such manner that oil or gas accumulation in the strata are sealed off and cannot escape. The most common structural traps are: 1) Fault traps 2) Anticlines 3) Salt Domes
Wildcat well	An exploratory well being drilled in unproved territory, that is in a reservoir from which there is no production, in the general area.

CHAPTER 1

INTRODUCTION AND SCOPE

At the request of Congressman Hamilton Fish, Jr. and Senator Clifford P. Hansen, we reviewed the Department of the Interior's August 17, 1976, sale of 154 oil and gas tracts on the Outer Continental Shelf (OCS) off the Maryland, Delaware, and New Jersey coasts (Sale 40), more commonly known as the Baltimore Canyon. (See app. I and II.) Pursuant to the requests and agreements reached with their office, we reviewed Sale 40 and compared it with the December 11, 1975, Sale 35, off southern California 1/.

The main thrust of this request was to compare the tract selection, presale evaluations, and the postsale review of bids made by the Department for both sales, and provide information as to why Sale 40 received three times as much bonus revenue as did Sale 35. In addition, if time permitted, we were also requested to obtain as much information as possible about the Department's revenue estimates for Sale 40.

We reviewed the adequacy of the tract selection and presale evaluation procedures used. In conducting the review we:

--interviewed officials at the Department's Geological Survey (Survey) headquarters in Reston, Virginia; and its eastern regional office in Washington, D.C.; the Bureau of Land Management (Bureau), Washington, D.C.; and various petroleum industries;

--reviewed pertinent records on Sale 40 at the Department's headquarters and regional offices in Washington, D.C.;

1/ The General Accounting Office has issued three reports which directly relate to OCS leasing. They are "Outlook for Federal Goals to Accelerate Leasing of Oil and Gas Resources on the Outer Continental Shelf," (RED 75-343, March 19, 1975), "Outer Continental Shelf Oil and Gas Development--Improvements Needed in Determining Where to Lease and at What Dollar Value," (RED 75-359, June 30, 1975), and "Outer Continental Shelf Sale 35--Problems Selecting and Evaluating Land to Lease, " (EMD 77-19, March 7, 1977).

--examined applicable regulations, policies, procedures, and practices pertaining to Federal leasing of the OCS; and

--assessed reasons for the higher bidding results for Sale 40 when compared to Sale 35.

ROLE OF THE DEPARTMENT OF THE INTERIOR

The Outer Continental Shelf Lands Act (43 U.S.C. 1331) provides for U.S. jurisdiction over OCS submerged lands--all submerged lands seaward and outside State waters. Federal jurisdiction of OCS lands generally begins about three miles from the coastline of each State. The act authorizes the Department to lease such lands for certain purposes, including production of oil and gas, and to regulate OCS oil and gas operations to prevent waste and conserve natural resources. The act requires that oil and gas leases be issued only on a competitive bidding basis. Leases are awarded through sealed bids on the basis of the highest (1) cash bonus bid with a fixed royalty or (2) percentage royalty bid with a fixed cash basis. Except for one sale where 10 leases were offered on the basis of a royalty bid, all of the Department's leasing has been on the basis of bonus bids.

The Bureau executes the leases of OCS lands with the stated leasing and management goals of (1) providing orderly and timely resource development, (2) protecting the environment, and (3) receiving a fair market value return for leased resources.

The Survey is responsible for valuing tracts before leasing on the basis of engineering and other technical evidence and economic analysis. Its valuation data is used as the basis for judging the acceptability of industry bids. The Survey is also responsible for assisting the Bureau in its leasing objectives by (1) providing technical and administrative assistance, (2) providing services for managing and disposing of OCS areas, and (3) supervising and regulating exploration, development, and production activities on tracts after they are leased.

The Department's system of selecting areas for lease has a direct impact on the ultimate discovery of oil and gas. Selecting the most promising areas will encourage rapid development. Historically, OCS lease offers have been scheduled on an irregular basis. Industry interests and the desire to obtain money for the U.S. Treasury through bonuses generally determined when and where to lease OCS lands.

OCS SALE 40

The Department's OCS leasing program for frontier areas is part of the Federal effort to reduce dependency on foreign energy sources. The available geologic evidence indicates that the frontier OCS areas hold the most promise for making additional large discoveries of oil and natural gas.

On March 26, 1975, the Department announced the call for nominations and comments on the proposed OCS lease Sale 40, mid-Atlantic. The call area consisted of 1,151 tracts totaling 6.5 million acres, out of which 557 tracts totaling 3.2 million acres were nominated by 20 companies.

The Department believed that because 20 companies participated in the nomination process a strong interest was expressed for this OCS frontier area. From the 557 tracts nominated by industry, 154 tracts totaling 876,750 acres were selected for inclusion in this OCS lease sale. The sale was originally scheduled to take place in May 1976, but the actual sale was delayed until August 17, 1976. The three month delay was the result of additional time required for preparing the environmental impact statement and for additional State input. Survey valued the 154 tracts offered in the sale at $620 million. Bids were received on 101 tracts. Of these tracts, 93 were subsequently leased for a total of $1.128 billion in bonuses. The high bids for the eight tracts not leased totaled about $7.9 million.

REVENUE ESTIMATES FOR SALE 40

Revenues received from OCS lease sales are deposited in the U.S. Treasury. The Government predicts the revenue impact of these sales to properly budget each fiscal year. These budget estimates represent the total bonus revenues expected during the budget period. Budget revenue estimates should not be confused with Survey's presale value which is assigned to each tract to help ensure that a fair market value return is received for leased lands.

The differences between the two amounts are that (1) the revenue estimate prepared by the Department represents the expected revenues from holding the sale, and (2) Survey's presale value represents the minimum amount acceptable for the leasing rights to a specific tract.

The following table shows some of the budget revenue estimates prepared within the Department for Sale 40.

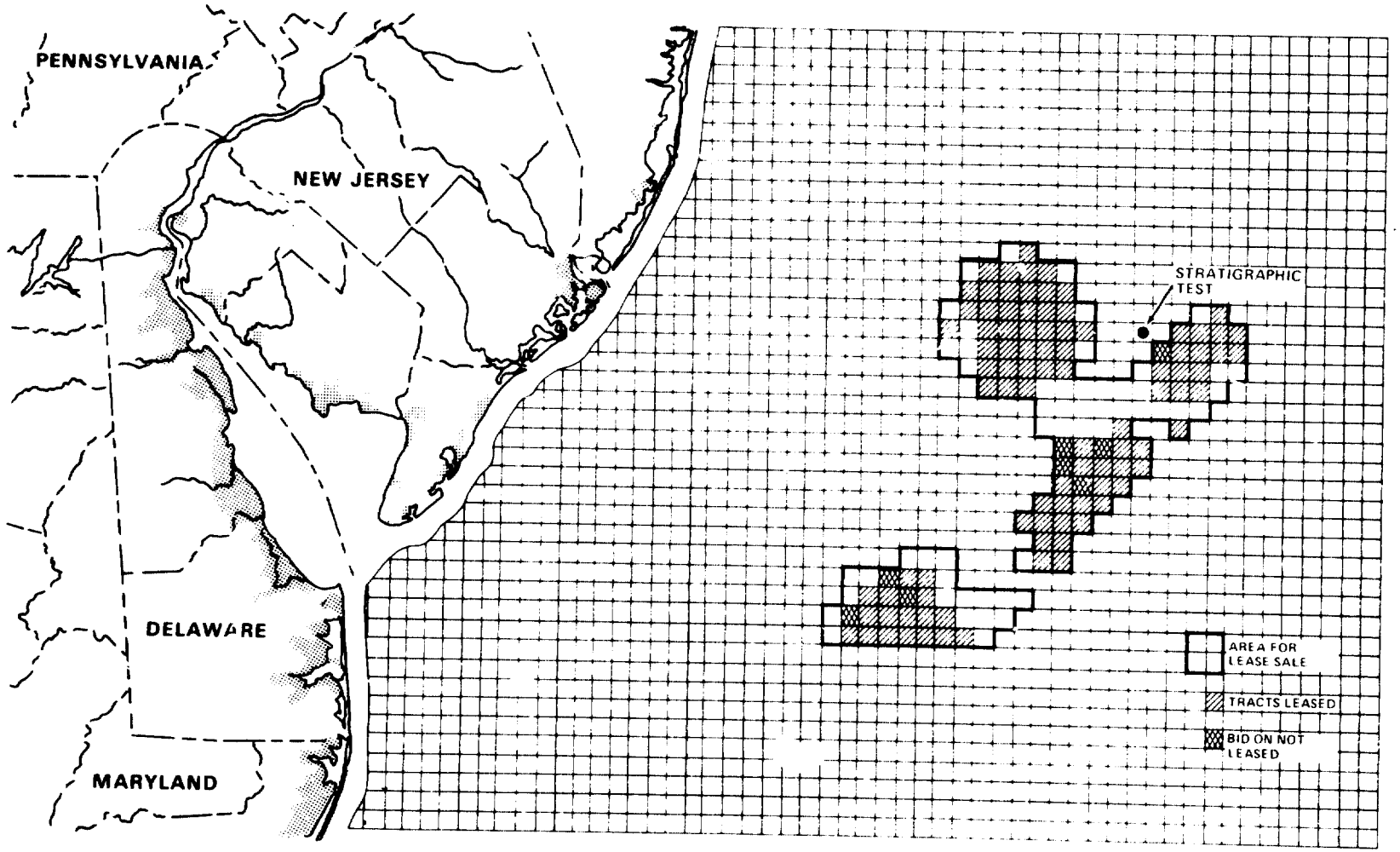
Parameters considered	Date Of Revenue Estimate 9/13/74	11/25/74 1/	5/20/75 2/	12/12/75 3/	* 4/
Acreage offered (million acres)	3.5	3.5	3.5	.9	--
Acreage leased (million acres)	1.5	1.75	1.75	.45	--
Bonus per leased acre	$3,000	--	--	--	--
Bonus revenue estimate (billions)	$4.5	$3.0	$2.8	$1.2	$.4-.6

1/ Discounted cash flow computer model used.
2/ Reduction from previous estimate based on elimination of the oil depletion allowance and revised resource estimates from Survey.
3/ Reduction from previous estimate based on the reduced acreage offered.
4/ The staff of the Assistant Secretary-Program Development and Budget was unable to furnish us with any documentation for this revenue estimate, but they stated it was based on the actual bonus revenues received from two previous frontier area sales, the southern California sale of December 11, 1975, and the Gulf of Alaska sale of April 13, 1976.

The bonus receipt estimate which was used by the Office of Management and Budget (OMB) for budget purposes was the 12/12/75 estimate of $1.2 billion. This estimate was close to the bids eventually accepted ($1.1 billion). This appeared to occur more by chance, however, than by design. The Secretary of the Interior announced before the sale that $400-600 million would be received from holding this sale based on the Assistant Secretary-Program Development and Budget's average of two prior frontier area sales.

OMB applies a probability analysis to OCS revenue estimates which attempts to assess the chances of OCS sales occurring each year and the estimated funds the Government will receive. OMB applied their probability factoring to this estimate and felt the sale would not be held until fiscal year 1977 and would receive $350 million. OCS Sale 40 was actually held during the Transition Quarter (July-September 1977) and as a result, OMB adjusted their fiscal year 1977 bonus receipt estimates.

MAP OF TRACTS OFFERED AND LEASED OCS SALE 40



CHAPTER 2

PROGRAM OPERATION AND NATIONAL OBJECTIVES

It is generally agreed that limited national and world supplies of oil and natural gas exist. Many experts forecast that these resources will be depleted in the next 30 to 40 years. The United States is a significant user of these fuels--presently consuming more oil and natural gas than it produces.

As demonstrated by the Arab oil embargo in late 1973 and this past winter's severe conditions, an inadequate supply of these fuels can drastically affect our economy. There is little disagreement that the question of future energy supplies is one of the major problems facing the United States and the world today. To meet this problem, the Administration has proposed a multifaceted approach. The Nation is attempting to "buy time" until new energy technologies are developed. To help in obtaining the needed research and development time, the President and leading policy and scientific bodies are encouraging prudent use of these resources. Conservation is believed to be the cheapest and best means of maintaining adequate near term energy supplies. Additional use of coal nuclear power, and renewable resources as a source of energy is being encouraged as an interim measure. Additionally, more effort is needed to find and develop the Nation's remaining oil and natural gas resources.

Because about one third of all remaining domestic oil and gas resources are thought to be on the OCS, tremendous reliance has been placed in the OCS leasing program for meeting our near term energy needs. The Department leases OCS lands with the stated goals of (1) providing orderly and timely resource development, (2) protecting the environment, and (3) receiving a fair market value return for leased resources. To achieve these goals, particularly orderly and timely resource development, we believe it is important to have reliable geologic information about OCS resources and development potential. More data would increase the ability of the Government to develop a good lease schedule, select and evaluate tracts, and better focus the limited industry capital available for resource development.

In the Department's comments on our Sale 35 report they stated that our criticism of Sale 35 was unwarranted because our analysis was based on one sale. They said that Sale 40

resulted in high industry bids and did not fit into our analysis of Sale 35 or the OCS leasing program. The Department was making the assumption that a sale which generated high industry bonus bids was proof that a sale was a success and the OCS leasing program was sound.

We do not believe that high bonus bids are the best measure of a successful leasing program. Under this assumption the MAFLA sale (Sale 32) of the Destin Dome area held in December 1973 would be considered a successful sale--over $1.5 billion of industry revenue was paid for tracts offered in this sale. To date, however, no resources have been found and $1.5 billion is no longer available to the industry to possibly use for other OCS resource development. An indication of industry's opinion of Sale 32 can be seen in their actions. Of the 87 tracts leased in this sale, 22 have been relinquished despite the fact that the primary lease term has not expired. Additional presale reconnaissance and regional work by Survey with their interpretations would probably have reduced the sale value and the bonus revenues received for these lands, but it would not have tied up this amount of industry capital. A good sale, in our opinion, selects the most promising acreage where presale exploratory data and interpretations reduce the risk and will better assure the receipt of a fair market value for leased lands. As the situation stands now, industry and the Government basically are gambling. They engage in a high risk investment for development on the OCS because both parties operate on the basis of limited information and make many assumptions. These assumptions can never be eliminated but they can be minimized by obtaining additional data and by astute interpretations of existing information. The present leasing program results in wasted administrative effort by the Government, the offering and leasing of much non-productive acreage, and the loss of limited and vital industry capital in non-productive bonuses and subsequent drilling expenses.

Although the production potentials for Sale 40 are still not known, we believe the facts surrounding this sale show that the same type of problems which we discussed in our Sale 35 report existed again. For Sale 40 this resulted in the (1) unreliable selection of tracts offered for lease, and (2) unreliable estimates of their worth, based on assumptions with no reservoir parameters. Thus the OCS leasing program does not assure that the best areas are being offered for development and the program encourages industry

to speculate and tie up significant amounts of capital in lands that appear to have less development potential. In addition, the leasing of questionable lands encourages industry to expend additional capital exploring these leased lands. We do not believe this is the best use of available capital.

Obtaining additional geologic data with interpretations would help establish a more reliable tract value. These values are used as the basis to accept or reject industry bids. The combination of unreliable tract values with limited bidding competition (70 percent of the tracts bid on in Sale 35, and 49 percent of the tracts bid on in Sale 40 got only 1 or 2 bids) reduces the chances of the public receiving the fair market value return on all tracts for the resources sold. The following facts about Sale 40 demonstrate these conclusions.

--Included in the final tract selection were 47 tracts (30 percent) classified by Survey as "preference 2." Preference 2 tracts were defined as having less than 50 percent of their area consisting of a structure. Preference 1 tracts were defined as having more than 50 percent of their area consisting of a structure. Survey stated that [for tract selection purposes] preference 2 tracts were obviously marginal and that examining additional data may show that they have no portion of a structure (a factor highly favorable for resource development) on them. Survey's subsequent evaluation of additional seismic data for these 47 preference 2 tracts resulted in 43 of the tracts being assigned the minimum value, $25 an acre. The Department leased 21 of these 47 preference 2 tracts for $40.3 million. The fact that Survey interpreted these tracts to either contain no structure or nominal structure on them does not preclude the discovery of producible quantities of oil or natural gas. Stratigraphic traps--geologic features not as readily detectable by seismic surveys as structures--might possibly exist. However, most oil and gas development comes from structures not stratigraphic traps, according to Survey. We believe this shows that tracts of a lower priority, based on known geologic factors about resource potential at

tract selection, were included in this sale. A more detailed knowledge of the tract selection area might have detected additional tracts meeting the preference 1 criteria.

--All 154 tracts had a Survey reliability rating of "E" on a decreasing scale from "A to G". The "E" rating was defined by Survey as sufficient seismic information to identify structure, there were no producible wells in the area, and Survey was unable to establish stratigraphic trends and conditions. Survey stated that the "E" rating was basically equivalent to the "D" rating used in Sale 35 (see app. IV). The change in the reliability rating was initiated because Survey's eastern Regional Office wanted a reliability rating applicable to the Atlantic OCS areas. The basic reliability ratings were developed for the Gulf of Mexico OCS areas where the most leasing has occurred and better geological knowledge exists. In contrast, the Atlantic OCS is a frontier area and basically unexplored. Survey felt that the reliability rating used for Sale 40 was better suited for the Atlantic because each category was better defined and more explicit. Additionally, Survey staff said that in the past the Bureau has used the lower reliability ratings as a basis to recommend acceptance of high bids on tracts below their presale value. Survey felt that these new reliability ratings might alleviate this occurrence because the definition for each category is more specific.

--Survey's final evaluation of tracts was based on seismic information and a stratigraphic test well drilled in the northern area of the sale. Survey's interpretations of the data showed that 108 tracts were estimated to contain either no resource or an insufficient amount of resource to make an economic profit. These tracts were valued at the minimum worth of $25 an acre.

--Although overall competition was better, there were still a significant number of tracts (49 percent) getting one and two bids each. In these kinds of non-competitive situations

where bidding is not heavy, it is important for Survey to have the best possible geological information to protect the public interest. We do not feel that they had this kind of information in Sale 40.

CHAPTER 3

NEED FOR IMPROVEMENT IN SELECTING TRACTS FOR LEASE

TRACT SELECTION PROCEDURES

The OCS Tract Selection Agreement of August 19, 1971, specifies the procedure by which the Bureau and Survey jointly select specific tracts for possible lease offering. Under this procedure, the Department gathers and reviews detailed geophysical, geological, engineering, economic, and resource information, and nominations on areas proposed for sale. Based on this review, an estimate of the potential supply of hydrocarbons is made and the size of the sale (in acreage) is modified, as necessary, to maintain the most adequate rate of production possible to meet the demand for these resources.

The Bureau and Survey headquarters offices are responsible for implementing Departmental objectives through specific guidance to their respective field offices for use in the actual tract selection process. This guidance must be consistent with the Department's leasing objectives and include, but not be limited to, such considerations as: (1) recommended sale size; (2) tracts or areas for special consideration; and (3) information relative to Administration or Department policy. According to the procedures, acreage is selected in sufficient amounts to attract industry interest and promote a fair market value return.

In the tract selection process, the Bureau and Survey field offices independently recommend tracts for inclusion in the sale. Before tract selection, the Bureau requests industry to nominate OCS lands on which it would like to bid if a sale is held. The number of nominations each tract receives is the predominant factor influencing the Bureau's tract selection. Survey recommends specific tracts based on technical information, including geological, geophysical, engineering, and paleontological information. Once the tentative selection lists are compiled, Survey and the Bureau meet to discuss tract selection differences and agree to a joint Bureau-Survey list. This list is forwarded to headquarters for review and a final list of tracts for the offer is determined. Before the offer, changes in the tract selection list are occasionally made by both headquarters and field offices.

INSUFFICIENT DATA AVAILABLE FOR TRACT SELECTION

In June 1975, we reported that although Survey and Bureau headquarters and field offices participate to some degree in various phases of tract selection, the Federal Government has relied primarily on industry interest in deciding where to lease. Determinations to lease specific tracts are based on industry nominations, geological inference, and speculation about whether oil and gas exist. We also reported, however, that neither Government nor industry had the geological data essential for adequately determining if geological characteristics necessary for petroleum accumulation exist in the wildcat tracts or the frontier OCS areas. Although OCS areas have potentially attractive geological structures, as identified by geophysical data and by extrapolation of geological trends, the geological characteristics and specific potentials for oil and gas are not known until holes have been drilled.

Even though the information received from stratigraphic test drilling would be valuable in identifying areas favorable for oil and gas accumulation, particularly in the previously undrilled areas of the OCS, the Department has been reluctant to take the lead in developing and implementing a systematic exploration plan for resource appraisal. This policy, we believe, is preventing exploration and resource appraisal from proceeding as systematically and efficiently as would otherwise be possible.

In late March 1975, the Department issued a call for nominations and comments on specific tracts for Sale 40 comprising an area of 6.5 million acres and consisting of 1151 tracts. Twenty petroleum companies responded to the Department's invitation and nominated 557 tracts.

The Department also had asked that industry and the public pinpoint specific areas which should not be considered for leasing because of environmental or resource conflict reasons. One respondent--a commercial fisheries association--asked that specific tracts be barred from consideration and as a result seventy-one tracts were eliminated. The decision to eliminate these tracts from the proposed sale offering was made after the fishing industry recommendation was supported by the Department's Fish and Wildlife Service, the National Marine Fisheries Service in the National Oceanic and Atmospheric Administration, and some coastal States.

Four coastal state governments also responded to the requests for comments on Sale 40 and one environmental organization objected to the proposed leasing of any tracts in the proposed 6.5 million acre area.

At the time of the call for nominations and tract selection, the Department had about 9,000 line miles of seismic data of which 7,000 fell within the call area and had an average spacing of 3 miles by 3 miles. In addition to this seismic information, magnetic and geochemical data was also available.

Magnetic data (magnetometer) measures the Earth's magnetic pull and can be used to interpret sea bed rock formations. This type of data is obtained by low flying airplanes. Survey stated the magnetic data was gathered about 2 years before the sale, and when used by itself does not provide detailed or reliable information because it is very interpretive. It is useful in confirming existing seismic interpretations.

Geochemical data (sea bed samples) can be analyzed primary to estimate the possible presence or absence of hydrocarbons on the sea floor. Survey stated that this information is subject to varying opinions.

Survey's interpretation of these data (seismic, magnetic, and geochemical) at tract selection caused them to state that resource estimates of this undrilled acreage were speculative at best. They stated that estimates were:

--based mostly on assumptions,

--should be treated largely as guess work, and

--should be used with extreme caution.

Our review of the seismic coverage available to Survey showed that the data did not cover the entire call area (6.5 million acres). Many tracts (about 25 percent) in the call area had no seismic coverage and numerous others 1/ had limited coverage. Survey told us that the seismic data covered the most prospective acreage in the call area based on the available information. Other areas with no seismic coverage were inferred to be less prospective because of indications from magnetic surveys and geochemical data, and the lack of industry seismic exploration in those areas.

1/We were unable to precisely verify the number of tracts with partial coverage because of the manner in which Survey maintains their information and the limited time available to prepare a complete analysis.

Survey did not have any drilling data nor were there any nearby producing fields to aid in evaluating and extrapolating geologic trends for the 6.5 million acres under consideration. As we will discuss later in Chapter 4, one deep stratigraphic test well was drilled after the tracts were selected to aid in evaluating their resource potential. Survey told us that the results of this deep stratigraphic test directly affected the assumptions made for over 40 percent of the input parameters used in their computer model to value each tract. (See p. 23 for further detail.) We are emphasizing this matter now because it demonstrates that the Department did not have the best information available for selecting specific tracts.

The stratigraphic test--affecting 40 percent of the input data for tract analysis--played a key role in Survey's evaluation of tracts. Despite the apparent value of this test in evaluating resources, the test was not performed before the final tracts were selected for inclusion in the sale to aid in assuring the best areas were chosen. The tests were performed after the final tracts were selected for inclusion in the sale to aid in evaluating their worth. As this example indicates, prelease drilling can provide valuable and beneficial information about rock porosity and permiability, and can be correlated with seismic data to help assure the best tracts are selected for sale.

Based on seismic data and industry nominations, individual lists of tracts were forwarded to Washington headquarters by the Bureau and Survey field staff. The field staffs jointly recommended in a July 1975 report to headquarters a tentative selection of 178 tracts. Forwarded with the field submission for Washington office consideration were an additional seven tracts recommended by the Bureau but not by Survey. The Bureau felt these tracts should be included because industry nominations were sufficient to warrant further study. Survey field staff felt that these seven tracts showed little indication of prospective resource value and that there was a weak technical basis for their inclusion and eventual evaluation. Also, Survey recommended two tracts on the basis of favorable geotechnical information. The Bureau did not recommend these tracts because of the low level of industry nominations they received. These additional tracts recommended by the Bureau and Survey brought the list of tentative tracts to 187.

Just before the joint tract selection report, Survey prepared a memo that discussed the tracts they were recommending for tentative tract selection. They stated that they were recommending tracts only where some portion of a structure was believed to exist. In this memo, they classified tracts as either "Preference 1 or 2." A tract was classified as Preference 1 if 50 percent or more of its area was interpreted as having a structure, and Preference 2 if less than 50 percent of its area was interpreted as having a structure. Survey noted that this classification was for tract selection only. Its purpose was to distinguish those tracts which were obviously marginal and may upon examining additional data be found not to have a structure. They noted that it was possible that further evaluation might show that some Preference 2 tracts may have more value than some Preference 1 tracts. Of the 178 jointly recommended tracts, 123 were classified as Preference 1 and 55 as Preference 2.

On August 11, 1975, the Bureau's Director submitted the final tract selection report for consideration to the Assistant Secretary, Land and Water Resources. The report recommended that 154 tracts be included in Sale 40. There were 94 Preference 1 tracts among those selected and 47 Preference 2 tracts. There were also 13 tracts 1/ included based on the Bureau's recommendation because they were heavily nominated. The Department deleted the remaining tracts from this sale after consideration of sale size and other factors (principally after discussions with other Federal agencies). As seen in the following table, only 18 of the 154 tracts selected for inclusion in Sale 40 received less than 10 nominations. We believe this is an indication of the Department's reliance on industry nominations for selecting tracts.

1/Six additional tracts were included in the sale because of the industry nominations they received after the joint Survey-Bureau tentative tract selection report.

Number of nominations received per tract	Number of tracts nominated by industry	Number of tracts selected for Sale 40
1	138	0
2	70	0
3	52	0
4	27	1
5	24	0
6	24	2
7	15	4
8	24	5
9	18	6
10	13	9
11	17	13
12	17	10
13	15	14
14	16	12
15	20	14
16	20	17
17	12	12
18	9	9
19	26	26
Total	557	154

EVALUATION OF PREFERENCE 2 TRACTS

Seismic surveys measure the speed of shock waves through various rock formations, providing information about the depth of various rock layers and the location and existence of structures which may contain hydrocarbons. Based on this data, "horizon maps" of each tract are made which detail the geology of the tract and any structures on it.

Three horizon maps of each tract were prepared with each map covering the geology at a different depth. Seismic surveys provide reliable information about the presence of structure--a highly favorable factor associated with oil and gas resources. Structures act as a trap and could contain these resources as in a reservoir. The fact that a tract does not have a structure on it, however, does not preclude the eventual discovery of producible quantities of oil or natural gas. Stratigraphic traps, not as readily detectable as structures by seismic surveys, might possibly exist and contain oil or natural gas. Survey told us, however, that most production is from structures, not stratigraphic traps.

The further evaluation of additional seismic data and the results of the deep stratigraphic test near the sale area

after tract selection confirmed Survey's original interpretation of Preference 2 tracts--most were marginal from a tract selection standpoint. Forty-three of the 47 Preference 2 tracts in Sale 40 were eventually assigned the minimum value ($25 an acre) because they lacked adequate structures.

We examined in greater detail the seismic interpretations of 29 tracts which Survey had evaluated as having no resource potential. Fourteen of these tracts were Preference 2 tracts. Survey's further seismic analysis of these 29 tracts showed that 10 had no structure on them and 19 had very limited portions of structure (less than 10 acres 1/ out of the 5,693 acres which comprised a tract). Survey's interpretation of seismic data for these tracts was so pessimistic about their resource potential that they did not even bother to run these tracts through the computerized simulation model which is used for estimating tract values. Survey officials stated that based on the input data for these tracts, they knew in advance the model would produce a zero value and, therefore, these tracts were assigned the minimum value of $25 an acre.

Survey personnel told us that seismic data does provide reliable data about the presence or lack of structure (structures are one factor highly favorable for resource development). We believe the inclusion of tracts in the sale with no or limited structure shows that tracts with a low potential for development were selected for Sale 40.

CONCLUSION

We believe that insufficient data existed at the time tracts were selected for inclusion in OCS Sale 40. Internal memorandums at the time of tract selection referred to the resource estimates of the area--based on the data coverage--as speculative at best. The estimates were based mostly on assumptions and should be treated largely as guesswork.

Our review of the seismic coverage noted that about 25 percent of the tracts in the call area had no coverage and many others very limited coverage. As a result, Survey did not know if some of these tracts were better than others actually offered. Survey had no drilling information and there were no nearby producing wells to aid in evaluating geologic trends and conditions.

1/Structure for one tract covered 20 percent of the tract and was interpreted on one of the three horizon maps.

We also believe that the inclusion of Preference 2 tracts called marginal by Survey from a tract selection standpoint indicates insufficient analysis of the area was made. At the time of tract selection, about 30 percent of the selected tracts offered were classified as Preference 2. The further evaluation of the Preference 2 tracts confirmed Survey's initial interpretations that the tracts were marginal for tract selection purposes. Thus there was no assurance that the best prospects in the mid-Atlantic were selected. In fact, tracts were selected and included in the sale despite indications of marginal geologic characteristics.

An analysis of the bidding for the Preference 2 tracts generally indicates that industry drew conclusions similar to Survey about the resource potential of these tracts. Generally, the bidding interest was low and it appeared to be speculative. For example, of the 47 Preference 2 tracts included in Sale 40, less than half (22) received bids. Seventeen of these received only one or two bids each and none of the tracts received more than three bids. The following table shows the bid pattern for these 22 tracts.

Number of bids	Number of tracts	Percentage of total tracts
1	10	45.5
2	7	31.8
3	5	22.7
Total	22	100.0

In addition, many of the bids were close to Survey's presale minimum value. Of the 39 total bids for these 22 tracts, 14 (36 percent) were from $25 to $50 an acre. The following table shows the bid ranges for the 39 bids. We believe it indicates that some companies were speculatively bidding on these tracts.

	Bid Range				
	$25-50	$51-60	$61-100	$101-110	over $110
Total bids within range	14	4	4	4	13

CHAPTER 4

RELIABILITY OF TRACT VALUATIONS HINDERED BY INSUFFICIENT DATA

Before a sale, each tract offered for lease is assigned an independent evaluation of its worth. This estimated value is a primary factor in determining the acceptability of industry bids and for assuring that the Government receives a fair market value return for the lease of public resources.

In our June 30, 1975, report to the Congress, we stated that the effectiveness of the Department's OCS evaluation program was being hampered by inadequate data and analysis. Because of poor or missing geological data, the Department was conservatively estimating tract dollar values in undeveloped areas. Our March 7, 1977, report on Sale 35, demonstrated that inadequate data existed to properly value the resource potential of tracts in that sale. Our analysis of Sale 40 shows that the Department continued to make tract evaluation decisions without sufficient data and interpretation for analysis. Tract value estimates were speculative and could not reasonably assure that the public received a fair market value return for each lease offering since inadequate competition existed for about 50 percent of the tracts.

TRACT EVALUATION PROCEDURES

Before each OCS lease sale, Survey calculates the presale values of tracts offered for lease and the Bureau audits and reviews Survey's evaluation procedure. During the evaluation process, Survey is responsible for providing the specific geological, geophysical, and engineering inputs obtained through in-house analysis of industry data submitted to the Department and through the purchase of seismic data. The Bureau provides certain economic inputs, such as estimates of oil and gas prices, discount rates, and tax considerations. This information is obtained through review of industry publications, Department guidelines, and independent research.

Survey's field office also furnishes the Bureau reliability categories for each tract, which indicates the adequacy of available geological, geophysical, paleontological, and engineering data, as well as other factors that will be used in the resource evaluation. It then gathers the data on all tracts and uses a scientific technique--the Monte Carlo Method of simulation--to develop a Range of Values, Mean Range of Values (MROV), and Discounted MROV, normally calculated using a discounted cash flow for each sale tract.

The simulation method is useful in analyzing problems where there are many uncertainties and data is often poor and based on subjective judgments. It can consider an unlimited number of variables to arrive at the MROV. Some variables considered in the evaluation are porosity, gas-oil ratios, recovery factors, production rates, rate of return on investment, and over 20 other geologic, engineering, and economic parameters and variables.

At least one week before the sale, a Bureau evaluation team reviews Survey's presale tract evaluation review package which consists of the tract values, reserve estimates, and all pertinent data used in the evaluation process. On the day before the sale, the review team submits to the responsible Survey and Bureau officials a report indicating the results of its review and discussing any area of possible concern regarding selected evaluation inputs.

Immediately after the sale, Survey and the Bureau jointly recommend to the Secretary whether specific bids on tracts should be accepted or rejected for lease. The primary emphasis in this decision is the receipt of fair market value. Factors considered in making this determination include Survey's reliability category rating and the high bid as a percent of the MROV, discounted MROV, and the average evaluation. The final acceptance or rejection decision is made by the Secretary.

Survey's presale valuation for the 154 tracts included in Sale 40 totaled $620 million. A minimum value of $25 1/ an acre was placed on 108 (70 percent) of these tracts. Survey officials said that these tracts were valued at minimum because they believed the tracts contained no resource or an insufficient amount of resource to make an economic profit. Seismic data was available for all the tracts selected for lease offering and the results of one deep stratigraphic test affected the input data used in the Monte Carlo simulation program for all tracts.

INSUFFICIENT DATA FOR ESTIMATING TRACT VALUES

The Monte Carlo simulation model incorporates over 30 factors of geotechnical, engineering, and economic variables in deriving specific tract values. Deriving these variables requires many judgments and involves many uncertainties

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1/The minimum bonus offer the Department would consider for lease acceptance.

which must be weighted and evaluated on the basis of individual experience, knowledge, and choice. The quality and quantity of data from which these judgments are based affects the reliability of the final value assigned to any tract.

There are no universally agreed upon standards in existence to determine the quantity and quality of data needed to make a reliable tract evaluation. Survey personnel, however, stated that three questions must be answered in order to determine the presence of producible hydrocarbons: (1) Does a structure exist? (2) What is the porosity of the rock? (3) Are hydrocarbons present?

The existence of structures is usually interpreted from seismic tests, while rock porosity is interpreted from electric logs and deep stratigraphic tests, and the presence of hydrocarbons can only be actually determined through the cores of wells.

If sufficient information exists for identifying the structure and determining the rock porosity and existence of commercial hydrocarbons, the risk associated with exploring a tract and finding the producible hydrocarbons would be minimized. Conversely, as the ability to answer any one or more of these conditions decreases, the risk associated with successfully exploring a tract increases. As a result, the value of a tract increases or decreases as the quantity of the data increases.

Survey assigns a reliability category rating to each tract to reflect the extent and adequacy of available technical data used to evaluate the tract. The ratings for Sale 40 differed from those used for Sale 35 in both number and definition.

The change in the reliability rating was initiated because Survey's eastern Regional Office wanted a reliability rating applicable to the Atlantic OCS areas. The basic reliability ratings were developed for the Gulf of Mexico OCS areas where the most leasing has occurred and better geological knowledge exists. Because the Atlantic OCS is a frontier area and basically unexplored, Survey felt that the reliability rating used for Sale 40 was better suited for the Atlantic. Each category was better defined and more explicit. Additionally, Survey staff said that in the past the Bureau has used the lower reliability ratings as a basis to recommend acceptance of high bids on tracts below their presale value. Survey felt that these new reliability ratings might alleviate this occurrence because the definitions for each category were more specific.

Seven categories were established for Sale 40 ranging from A to G; whereas, a scale of A to E was used in Sale 35. As the reliability category changes from A to G, the risk factor increases because the technical data used is more limited. It is critical to understand that there are no specific guidelines, criteria, or parameters as to how a tract should be rated. The rating is subjective based on the definition of each category and the experience of the technical staff making the rating. All the tracts in Sale 40 were assigned an "E" reliability rating. Ninety-one percent of the tracts in Sale 35 were rated as "D". The "E" reliability rating used in Sale 40 was defined as sufficient seismic control to identify structure, and there is no production on trend and insufficient well control to establish stratigraphic trends and conditions. The "D" rating used in Sale 35 was defined as fair to good knowledge of structure with questionable stratigraphic data on gross sand conditions and depth. The knowledge of geologic risk is considered fair to poor. (See app. III and IV for Survey definitions of the reliability categories used in these two sales.) Survey told us that the "E" rating in Sale 40 was comparable to the "D" rating in Sale 35.

Our review of Sale 40 showed that the Department had less overall geologic information to evaluate tracts than they did in Sale 35. The table below briefly summarizes the geologic data available to the Department for tract evaluation for these two sales.

Geologic Data Available
To Analyze Tracts

Number of	Sale 35 1/	Sale 40
Acres offered	1,260,000	877,000
Line miles of seismic data for each 1,000 acres	11.1	8.0
Coreholes	239	0
Deep stratigraphic tests	21	1
Onshore fields studied and characteristics extrapolated	414	0

1/ There were four prospect areas in Sale 35. The 239 coreholes and 20 deep stratigraphic tests were primarily from one prospect area. Eight tracts leased from this prospect area accounted for 53 percent of the total Sale 35 revenues.

Under the present leasing program, it is not unusual that limited geologic knowledge exists about frontier OCS areas. We believe, however, that since it is critical to develop domestic energy resources, a systematic approach is needed to evaluate these OCS areas and help manage them in a manner consistent with national energy policies.

The preceding table shows that the Department relied primarily on seismic data to value the tracts in Sale 40. Although Survey officials were confident that structure knowledge was good due to seismic coverage, they stated that the density of coverage was not uniform and some tracts had more coverage than others. They told us that they would have preferred more data, however, they believed the amount of seismic data acquired and the one deep, off-structure stratigraphic test well were adequate for tract evaluation purposes.

IMPACT OF DEEP STRATIGRAPHIC TEST ON EVALUATION

In addition to the seismic data available for tract evaluation, Survey had data from 1 deep off-structure stratigraphic test located two tracts west of tract 40033 in the northern sector of the sale area. (See map. p. 5.) The test was financed by 31 petroleum companies which shared the information. Test results were also shared by Survey as required by the permit stipulations. Survey told us that the deep stratigraphic test provided knowledge that favorable porosity and permiability conditions were present in the test well area. Survey also stated the test influenced to some degree the determination of over 40 percent of the input data of the Monte Carlo simulation program. Some of the parameters influenced were:

--the probability of a prospective tract being dry,

--the anticipated exploratory and development well depths to possible reservoirs,

--the probable net oil and gas pay, and

--the possible range of reservoir porosity.

A Survey official stated the decision to hold the off-structure stratigraphic test in the northern part of the sale area was based on the assumption that this area looked to be the most prospective area in the sale. The Survey official told us that additional stratigraphic tests in the central

and southern parts of the sale area would have been beneficial. The knowledge obtained from these additional wells would have provided Survey with the ability to better correlate seismic with stratigraphic data; this information would have reduced the risk, better assessed the probable range of the fair market value estimates and better focused industry capital to tracts with the best potential for resource development. These additional stratigraphic wells, however, were not drilled. The one stratigraphic test well by itself was inadequate to increase the reliability rating of Survey's tract evaluations because there were no other stratigraphic test wells in the area with which to correlate the data. The test provided information indicating potential conditions for resource development existed in the immediate area of the site. The extent to which the conditions, identified in the test area, existed throughout the sale area could not be reasonably assessed.

OCS Sale 40 was conducted on August 17, 1976. The following schedule provides some general information about the sale.

Statistics About OCS Sale 40

	Total	
	Number	Percent
Tracts in sale	154	100.0
Tracts valued at minimum	108	70.0
Tracts receiving bids	101	66.0
Minimum valued tracts receiving bids	58	--
Tracts leased	93	60.0
Average water depth of tracts leased (meters)	88	--

HIGH ROYALTY RATE TRACTS

Historically, the Department has leased OCS tracts based on a fixed bonus bid plus a 16-2/3 percent royalty rate on production. In Sale 40, 15 tracts were offered for lease at a higher royalty rate (33-1/3 percent) to increase bidding competition. In theory, front-end bonus payments provide investors an incentive to explore leased tracts in a timely manner. The effect of increasing the royalty rate is to decrease the front-end bonus payment and shift the Government's return to the production phase. Shifting the payments away from the front-end bonus payment should tend to increase competition because it allows smaller companies with more limited capital resources a better chance at successful bidding.

Within the Department, the Office of Program Development and Budget recommended that tracts valued at $10 million or more (at the 16-2/3 royalty rate) be offered at a 33-1/3 percent royalty rate. It was believed that the higher royalty rate would not decrease the bonus bidding for these tracts to an extent where there would be inadequate incentive to explore the leased areas in a timely manner.

The overall bidding results for Sale 40 indicate that the competition for these 1/3 royalty rate tracts was significantly higher than on the 1/6 royalty rate tracts. None of these tracts received a lone bid and the 15 tracts got an average of twice as many bids as the 1/6 royalty rate tracts. They also received about 50 percent of the total high bids. Although the higher royalty rate probably did account for some increased bidding competition, another factor impacting on the bidding was that these 15 tracts were selected from a list of the 22 most prospective. Thus it is probable that interest in these tracts would be high under any circumstances. The following table summarizes this information.

Comparison Of One-Sixth And One-Third Royalty Tracts

	One-Third royalty		One-Sixth royalty		Total Tracts	
	Number	Percent	Number	Percent	Number	Percent
Total number of tracts	15	9.7	139	90.3	154	100.0
Number of tracts receiving bids	15 1/		86		101	
Average number of bids per tract	7.3		3.5		4.1	
Number of tracts with single bids	0		28		28	
Total high bids (millions)	$544 2/	47.8	$592	52.2	$1,136	100.0

1/Two of these high royalty tract bids were rejected.

2/Total bonus dollars actually received from the 13 tracts whose bids were accepted was $537 million or 47.6 percent of the total for all bonus dollars accepted.

Major oil companies (companies with average daily production of crude oil, natural gas, or liquefied petroleum products exceeding 1.6 million barrels worldwide) were prohibited in Sale 40 from joint bidding with each other. Nine oil companies met this criteria for Sale 40 and were classified as majors. These companies, however, are not prevented from joint bidding with non-major oil companies.

An analysis of the bidding results for the 13 higher royalty tracts leased showed that the 5 major companies which successfully bid retained about a 55 percent interest 1/. The remaining 45 percent interest in these tracts was split among the 20 other successful bidders. In comparison, the majors retained about a 45 percent interest in the 1/6 royalty rate tracts.

COMPETITION IN SALE 40

The competition in Sale 40 was greater than in Sale 35, however, there was still a significant proportion of one and two bid tracts as the following table shows.

	Total tracts receiving bids		High royalty rate tracts	
Number of bids on each tract	Number of tracts	Percentage	Number of tracts	Percentage
1	28	27.7	-	-
2	21	20.8	1	6.7
3	7	6.9	-	-
4	5	5.0	-	-
5	4	4.0	1	6.7
6	5	5.0	2	13.2
7	8	7.9	1	6.7
8	15	14.8	7	46.7
9	7	6.9	3	20.0
10	1	1.0	-	-
Total	101	100.0	15	100.0

1/It should be noted that this percentage will vary depending on the definition of a major oil company. For Sale 40, the majors were (1) Amoco Production Company, (2) BP Alaskan Exploration, Inc., (3) Chevron Oil Company, (4) Exxon Corporation, (5) Gulf Oil Corporation, (6) Mobil Oil Corporation, (7) Shell Oil Company, (8) Standard Oil Company of California, and (9) Texaco, Inc. Other large companies not considered a major for this sale successfully bid on these tracts.

Seventy percent of the tracts in Sale 35 receiving bids got only one or two bids. For Sale 40, about 49 percent of the tracts bid on got one or two bids. Other factors also show increased competition for Sale 40 over Sale 35 as follows:

--a much larger percentage of tracts offered in Sale 40 were bid on than in Sale 35 (66 and 30 percent respectively), and

--the average number of bids for each tract was much greater for Sale 40 than Sale 35 (an average of 4.1 bids and 2.4 bids for each tract respectively).

We continue to believe, however, that the high percentage of one and two bid tracts in Sale 40 still indicates inadequacies in sale competition. As stated in our Sale 35 report, a competitive leasing program is based on the premise that competition will provide a fair market value. When competitive conditions do not exist, however, it becomes increasingly important to have reliable tract values to use as the basis for accepting or rejecting bids. When large percentages of the total tracts in a sale receive one or two bids per tract or are minimally valued, speculation can be a strong incentive.

We also analyzed the distribution of bids for one and two bid tracts. We found that 42 of the 49 tracts were leased and 41 were minimally valued by Survey at $25 an acre. The other seven tracts were not leased and were valued above minimum. The following table shows, that many of the bids were very close to the minimum value. Thirty of the 58 bids were under $60 an acre (20 of these 30 bids were under $38 an acre). Overall, the average high bid for these 42 tracts was about $340 an acre. The average high bid for all other tracts leased (tracts with three or more bids) was more than 10 times greater--$3,605 an acre. We believe these statistics indicate that speculation was a strong motivating force in bidding on many of these tracts. Although Sale 40 did generate better competition than Sale 35, we continue to believe that greater competition on the OCS is needed.

Frequency Distribution Of Bids For

Tracts Receiving One Or Two Bids And

Dollar Per Acre Bid

Dollar an acre bid range	Tracts receiving one bid	Tracts receiving two bids		Total number of bids in each acre range
		Accepted	Rejected	
25- 50	8	2	11	21
51- 60	5	2	2	9
61-100	4	2	1	7
101-110	2	-	1	3
over 110	5	11	2	18
Total of one and two bid tracts accepted	24	17		
Total of all one and two bids				58

RELEVANCE OF DATA TO SALE RESULTS

In our Sale 35 report, we presented information which compared Survey's presale values for minimum valued tracts with the average accepted bid on those tracts. That information demonstrated the discrepancies between the Department's presale tract values and the bid amounts received. The analysis showed a large range between the Department's and industry's evaluations.

There were 58 minimum value tracts leased in Sale 40. Industry, however, when evaluating these same tracts, frequently drew different conclusions about their value. The average accepted bid per acre for these 58 tracts was about $484 (about 2,000 percent greater than Survey's values). While not conclusive, it is apparent from the averages that industry either had, or thought it had, information which indicated the tracts to be potentially far more valuable than did Survey.

The uncertainty over fair market value of tracts appears to encourage speculation by industry. We are aware that industry defines this speculation as competition. However, the results of this degree of uncertainty may cause industry to tie up capital in lands with minimum or no resource potential or buy very good lands for less than fair market value. Until these tracts are further explored and potential resources are developed, no one knows whether the capital applied to these tracts was excessive or will provide a sizable return for the investment.

The inadequacy of data can also be seen in the postsale review of bids. In our Sale 35 report, we pointed out the Department's lack of confidence in their own valuation of tracts. The Department revalued 8 tracts downward after bids were received. Five of these tracts were eventually leased for $79 million less than the presale values. (See the following table). We criticized this practice because, in our opinion, values developed after bids are received may be influenced by subjective judgments and political pressures.

Tracts in Sale 35 Which Had Their Presale Values Adjusted Downward After Bids Were Known

Tract number	Presale value	Accepted high bid	Rejected bid	Difference
35075	$34,836,272	$10,143,360	--	$24,692,912
35076	24,547,360	5,276,160	--	19,271,200
35103	35,144,960	12,210,000	--	22,934,960
35104	43,044,496	33,356,160	--	9,688,336
35114	12,090,264	9,268,000	--	2,822,264
35074	10,813,071	--	$ 253,800 1/	10,559,271
35116	6,826,502	--	1,521,125 1/	5,305,377
35126	26,098,096	--	3,050,165 1/	23,047,931
Totals for rejected tracts	$43,737,669	--	$4,825,090	$38,912,579
Totals for accepted tracts	$149,663,352	$70,253,680	--	$79,409,672
Combined totals	$193,401,021			$118,322,251

1/ These tracts were not leased; the bids were rejected.

In the postsale bid analysis for Sale 40, ten tracts had high bonus bids accepted below Survey's presale value. The bids were accepted because they were greater than the Bureau's Average Evaluation of Tracts (AEOT). The Bureau's AEOT is derived by averaging all the bids plus Survey's presale value. An example of this averaging to derive the Bureau's AEOT is seen for tract #40141.

Example Of How The Bureau's AEOT Is Calculated For Tract 40141

Bid	Amount of bid
1	$16,355,000
2	15,460,000
3	9,062,000
4	7,360,000
5	2,589,696
6	2,529,000
7	801,008
8	301,579
Total of bids	$54,467,283
Survey's presale value	40,740,576
Total	$95,207,859
Bureau's AEOT (total above divided by 9)	$10,578,651

As this example shows, using this procedure reduced the value of this tract by about $30 million (from about $41 to $11 million).

The following schedule lists the 10 tracts leased for less than Survey's presale value. It shows the highest bid accepted, Survey's presale values, the Bureau's AEOT for ten tracts and the differences between the accepted bid and Survey's presale value.

In Survey's postsale analysis of these ten bids, it recommended that eight be rejected. Survey recommended this because they believed the interpreted technical information established a reliable tract value and the high bids were not reasonable. But these bids were accepted and the tracts leased, because the high bid exceeded the AEOT. The other two were recommended by the Survey to be accepted because of the closeness of the bid to the presale value.

Comparison Of High Bid Accepted To Survey's Presale Value And The Bureau's AEOT

Tract #		High bid accepted	Survey's presale value	Bureau's (AEOT)	Number of bidders	Difference between high bid accepted and Survey's MROV
40005		$ 2,533,000	$ 3,327,844	$ 1,049,203	7	$ 794,844
40006	1/	3,212,000	7,382,149	2,068,824	7	4,170,149
40128	1/	7,264,000	15,085,830	5,358,042	5	7,821,830
2/ 40130	1/	6,167,808	10,451,952	2,874,574	7	4,284,144
40138	1/	5,260,000	8,996,905	2,844,337	7	3,736,905
40139	1/	31,790,000	43,363,760	13,267,967	9	11,573,760
2/ 40140	1/	23,747,328	42,347,600	12,558,588	9	18,600,272
40141	1/	16,355,000	40,740,576	10,578,651	8	24,385,576
2/ 40150	1/	19,677,800	41,785,280	12,831,742	8	22,107,480
40151		33,780,000	35,191,888	13,920,792	7	1,411,888
Totals		$149,786,936	$248,673,784	$77,352,720		$98,886,848

1/Bids recommended for rejection by Survey.

2/Tracts containing higher royalty rate of 33-1/3 percent.

According to Bureau officials this procedure of deriving their AEOT is done as part of their postsale review of bids, helping them to recommend acceptance or rejection of the highest bid on any particular tract. The Bureau treats Survey's presale value for any tract as just another bid from an oil company.

Additional factors taken into consideration by the Bureau when deciding to recommend acceptance or rejection of a bid based on their AEOT are the type of tract (for example wildcat or drainage), the reliability rating assigned to the tract (A through G), and the average number of bidders per tract for the sale being reviewed. For Sale 40, all of the tracts were considered wildcat with a reliability rating of "E". The average number of bids per tract was 4.1. There were from five to nine bidders for the ten tracts that were leased based on the Bureau's AEOT. The amount accepted on these tracts was about $99 million less than Survey's presale values.

The Department leased these tracts for less than the presale value on the basis that each of these tracts had good bidding competition and the presale values were unreliable.

Conceptually, the Department's use of the AEOT is somewhat questionable. The Department only gave special consideration to tracts with bids below the presale value. However, it must be recognized that the range of error exists on both sides of a presale tract value. Thus it can be argued that special consideration should also be given to certain tracts receiving high bids greater than the presale value if those tracts had only limited competition. For example, if the Department was willing to accept a bid about 60 percent below their presale value (tract 40141) because the tract had adequate bidding competition and the presale values were of low reliability, then conceptually it would seem reasonable to also reconsider in some manner bids exceeding presale values where competition was not strong and the reliability of presale values was the same. The range of error exists on both sides of a presale value. If this is not done, then the system may appear inherently biased downwards.

Also because of the potential impact of low bids on the AEOT, there seems to be a need for a process to identify and separate bonafide and speculative bidders in those cases where competition becomes the key criteria in accepting and rejecting bids. For example, the 10 tracts leased on the basis of the Department's AEOT analysis, received a total of 74 bids. Fifteen of these bids (20 percent) were under $60 an acre. The high bid per acre accepted for these 10 tracts ranged from about $445 to about $5,934 per acre.

CONCLUSION

Our review of Sale 40 indicates, just as it did for Sale 35, that the Department had insufficient data with which to value tracts. We believe this for the following reasons.

--There was less overall information for Sale 40 than Sale 35. There was only one deep stratigraphic test off-structure for Sale 40.

--The reliability rating of the tracts was "E" which was basically equivalent to the Sale 35 "D" rating. The rating shows that at best only one of the three major parameters necessary for resource evaluation could be identified (structures) by seismic data.

--Although overall competition was better, there were still a significant number of tracts (49 percent) getting one and two bids each. In these kinds of non-competitive situations where bidding is not heavy, it is important for Survey to have the best possible geological information to protect the public interest. We do not feel that they had this kind of information in Sale 40.

--The differences in values assigned by Survey and by industry to the minimum valued tracts leased differed by an average of almost 2,000 percent.

CHAPTER 5

OBSERVATIONS ABOUT

INDUSTRY BONUS BIDDING

Our review of Sale 40 shows that the Department had insufficient data available for tract selection. Additionally, Survey's reliability ratings showed that all tract values developed were based mostly on assumptions. As we have discussed, the Department had less information for evaluating Sale 40 tracts than Sale 35 tracts. Despite the lack of comparable geologic knowledge, industry bonus bids were about three times greater in Sale 40 than Sale 35.

It is our position that the best measure of a sale's success is not the total bonus dollars bid, but the ultimate discovery and production of oil and gas that results from leasing. In our opinion, Sale 32 (held in December 1973) provides a good example that high bonus receipts is not indicative of a successful sale. Significant bonus revenues were received for Sale 32 tracts, however, after 3 years of postlease exploration and many dry holes, resources have not yet been found. Thus, bidding on the Sale 32 area resulted in about $1.5 billion of industry capital being tied up in non-productive leasing rights.

On the surface there are several similarities between Sales 32 and 40 as the following table shows. Both sales were considered by the Department to be in frontier areas. They were comparable in size, average bids for each tract, total bonus dollars bid, the percentage of tracts leased, and somewhat comparable in water depths (53 versus 88 meters) and distance from shore. As the results of Sale 32 show, it is evident that bidding results provide no assurance regarding the eventual production of OCS resources.

Comparison Of Sale Results For

OCS Sales 32, 35, And 40

	Sale 32		Sale 35		Sale 40	
	Amount	Percent	Amount	Percent	Amount	Percent
Total tracts offered:						
Number	147	100	231	100	154	100
Acreage	817,297		1,258,189		876,750	
Average water depth (meters)	53		324		88	
Average distance to shore (miles)	43		73		70	
Total tracts leased:						
Number	87 1/	59	56	24	93	60
Acreage	485,397		310,049		529,466	
Average bids per tract	4.2		2.4		4.1	
Total money bid (billions)	$3.405		$.902		$3.513	
Total money accepted (billions)	$1.491	44	$.417	46	$1.128	32
Average bonus per acre leased	$3,072		$1,346		$2,130	

1/ 22 leases (25 percent) have been relinquished to date.

We contacted 10 companies participating in Sale 40 to discuss in general the reasons for their interest. Based on these conversations, there appears to be several significant factors contributing to the higher level of bidding for Sale 40 than Sale 35.

--Overall the tracts for Sale 40 were much closer to the shore and would provide more favorable transportation costs. Of the tracts leased in Sale 35, 71 percent were from 80 to 100 miles offshore; whereas, of the tracts leased in Sale 40, 73 percent were 80 or less miles offshore.

--Water depths in the Sale 40 area differed significantly from Sale 35. In our report on Sale 35, we related that over 50 percent of the tracts offered exceeded existing technical production capabilities (about 1,000 feet). Our analysis of Sale 35 indicated that the most intense industry interest was in shallower areas. Tracts offered at depths exceeding present production capability (365 meters at the time of Sale 35) received only minimal interest (14 leased out of 128 offered). In contrast to Sale 35, no tract offered in Sale 40 was in water deeper than about 600 feet. The average water depth of tracts in Sale 40 was about 300 feet. In our June 1975 review of the Federal presale value system,

we found that the estimated value of a tract declines markedly in relation to water depths because of the uncertainties about costs and feasibilities of new technologies. For example, a tract having a value of $84 million in 400 feet of water decreases in value at 1,200 feet by about 80 percent, and at 1,600 feet by about 90 percent.

--The west coast is presently facing an oil glut, whereas, the east coast this past winter experienced energy shortages. The west coast is reported to have adequate supplies of oil and inadequate refinery capacity to handle additional supplies. In addition to the existing adequacy of west coast energy supplies, Alaskan oil began flowing in June 1977. The eventual distribution of Alaskan oil has yet to be determined.

--The major bidders in Sale 40 also have refineries located on the east coast as the following table shows.

Summary Of Sale By High Bid Amount Compared To Refining Capacity For Sale 40

Company	Total bids	High bids	Total bid ($ Millions)	Total high bids ($ Millions)	Mid-Atlantic 1/ refining capacity (Bbl/day)
Exxon Corp.	69	34	729.9	348.6	265,000
Mobil Oil Corporation	43	8	149.0	90.2	98,000
Shell Oil Corporation	38	12	243.2	83.5	0
Sun Oil Company	42	8	112.8	54.4	165,000
Chevron Oil Company	49	13	136.3	46.2	101,500
Atlantic Richfield Company	54	13	134.8	46.2	185,000
Getty Oil Company	31	7	92.9	37.7	140,000
Texaco, Incorporated	19	2	143.4	24.3	68,000
Gulf Oil Corporation	17	3	172.8	18.5	174,300
BP Alaska Exploration	30	0	71.2	0	143,000
Amoco Production Company	11	0	49.1	0	68,000

1/ Crude capacity in the mid-Atlantic area as of January 1, 1976 in barrels (Bbl) a day.

Our discussions with industry representatives generally confirmed that all of these factors played a part in their bidding analysis. However, they did not provide any information on the overall importance of any of these factors. In addition, industry representatives provided these other reasons.

--They considered the Atlantic to be one of the last two remaining frontier areas (Alaska is the other one) and felt it a good opportunity to develop possible energy resources in this frontier area.

--There was general consensus although not unanimous that the geology of the area appeared much better than in Sale 35.

--Several companies felt the area was gas-prone and that this made the area attractive because of high east coast demand for gas.

One other interesting observation on the reason for the increased bidding in Sale 40 over Sale 35 was provided by two separate companies. Each of these said their company would have participated in this sale even if no data had existed for the area. Each company felt that they had to take a position in the Atlantic OCS so as to meet competition.

We believe this statement may apply to more than just these two companies. This comment indicates that speculation by industry is a factor in bonus bidding. We believe better defining the resource potential of a proposed sale area can substantially reduce industry speculation and the risk associated in developing OCS resources.

CHAPTER 6

AGENCY COMMENTS, CONCLUSIONS, AND RECOMMENDATIONS

AGENCY COMMENTS

Because of the need to issue the report before passage of pending OCS legislation, the Department was unable within the given timeframe to formally comment in writing on the draft report or to comment on the facts presented in it. However, we did discuss informally with Department officials the report's recommendations. These officials told us that the Department's views on the report's recommendations would be similar to those expressed on the Sale 35 report recommendations which were stated in a letter from the Under Secretary of the Interior to Chairman Ribicoff, Senate Committee on Government Operations (see app. V). In this letter, the Under Secretary stated the following concerning the GAO recommendations.

> "These recommendations follow from the basic idea that there may be benefit from improving the information available about the location, extent, and value of OCS oil and gas resources before the sale of leases. Improved prelease information will be of benefit to the extent that it contributes to the achievement of three closely related objectives:
>
> 1. Enhancing competition and assuring the public a fair return for its resources;
>
> 2. Promoting timely and efficient exploration and development of oil and gas;
>
> 3. Improving planning for efficient and environmentally sound national energy policy, for OCS lease sales and for associated onshore development.
>
> The Department is committed to achieving these objectives and has supported amendments to the OCS Lands Act of 1953 to provide authorities that would facilitate the development and implementation of programs for these purposes including the authorities to offer permits for onstructure stratigraphic tests and to contract for exploratory drilling. In conjunction with

Congressional consideration of these amendments, the Department is undertaking a broad review of alternatives for achieving these objectives.

Systematic plans for appraising OCS resources will be developed and evaluated as part of this review. The Department will implement programs identified as most promising in the course of the review. In doing so it will collect the data needed to further evaluate their performance and provide a basis for continued improvements in the OCS leasing program."

CONCLUSIONS

The Nation's and the world's remaining supplies of oil and natural gas are limited. It is estimated that these reserves may last as little as 30 to 40 more years even if growth in their useage is decreased. The Nation greatly relies on the OCS leasing program for meeting our near term domestic energy needs, particularly while new energy technologies and conservation actions are under development. Decisions regarding where to lease and at what rate will have a significant impact on the future production of OCS resources.

We believe that the operation of the present leasing program is not the best way to develop OCS resources. The present program leases lands on the basis of minimal geologic information. The resource potential of OCS areas offered for lease are based on assumptions which at best can be termed as "educated guesses." Even though additional geologic knowledge received from stratigraphic test drilling would be beneficial in identifying and evaluating potential, the Department had not made an effort to obtain such data. As our analysis of the data available for tract selection in Sale 40, and Survey's reliability ratings of the values they develop for the mid-Atlantic OCS area shows, there is limited assurance that the best areas are being selected for leasing. Much of the area that is considered for lease is not even examined and tracts are included in sales despite their apparent low promise of resources. We believe this policy encourages speculation in bidding, can result in tying up limited industry capital in lands with no or minimal resources, and bring into question the public's right to receive a fair market value.

The oil industry paid a significant amount of capital for leasing rights to Sale 40 tracts. This fact in itself, however, is no assurance that energy resources will be found. As an examination of Sale 32 shows, even more capital was paid in bonuses for tracts in that sale, yet opinions of the area leased are now very pessimistic. The attainment of more

geologic knowledge before that sale might very well have reduced industry's willingness to pay such bonuses for those tracts, but a better allocation of industry capital would have been achieved.

We believe, as we previously stated in our Sale 35 report, that the Department should schedule lease offerings in geographical areas and adequate acreage amounts to extend the capability of the non-renewable resource as fully as possible and still meet our near term domestic energy needs. Before scheduling lease sales, however, the Department should conduct a systematic program to identify the amounts of resource available for production on the OCS. Such information gathered across the OCS would provide

--the Nation with a better knowledge of the total OCS resource potential for the purposes of formulating broad energy policy;

--Interior with a basis for setting priorities on the areas for leasing purposes;

--a better basis than now exists for evaluating resource development potential and potential environmental impacts (both within and between geologic areas) if used in conjunction with the results of available environmental information involving the same geologic areas; and

--more reliable valuing of tracts to assure that the public receives a fair market value return for the lease offerings.

RECOMMENDATIONS TO THE SECRETARY OF THE INTERIOR

The Secretary of Interior should take the following actions

--Direct a geological exploration program which would provide for the development and implementation of a systematic plan for appraising Outer Continental Shelf oil and gas resources, including selected stratigraphic test drilling. The plan should identify the level of stratigraphic drilling necessary to provide a minimal level of data coverage for major OCS areas.

--After the plan has been developed, encourage private industry to conduct the drilling identified in the plan subject to the developed information being shared

with Irterior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafide potential bidder to "buy-in" on the exploration by paying a pro-rata cost of the drilling.

After the extent of industry participation is known, if any data gaps still exist, take the necessary actions, including public financing of stratigraphic drilling, to obtain the needed data.

--In addition, after obtaining and evaluating the above information, take the necessary steps to encourage industry to obtain further information after the tract selection process is completed. These additional activities should focus on the specific tracts selected and help develop reasonably sound information for presale evaluation purposes. The results again should be shared with Interior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bonafide potential bidder to "buy-in" on the exploration by paying a pro-rata cost of the drilling.

After the extent of industry participation has been reviewed and evaluated by Interior, if any significant data gaps exist, take the necessary actions, including publicly financed stratigraphic drilling, to obtain data.

--Offer for lease sale only those areas for which the Department has collected and analyzed sufficient information to adequately identify where the resource is, its estimated value, and its potential for development in the near future.

--Evaluate the questions of whether it is in the national interest to have prelease exploration be either on-structure or off-structure as discussed in our March 7, 1977, letter. (See app. VI.)

These recommendations are the same as the ones stated in our Sale 35 report and our March 7, 1977, letter to the Secretary of the Interior.

RECOMMENDATION TO THE CONGRESS

Selecting high resource development potential tracts for sale and valuing them reliably to help assure that the public receives a fair market value return can only be accomplished effectively if sufficient geotechnical data exists at the

time decisions are made. The 94th Congress considered a bill (S. 521) which directed the Secretary to conduct a survey program of OCS oil and gas resources. As part of the survey program, the Secretary was authorized to either contract for, or purchase, required geotechnical information (including stratigraphic drilling) which is not available from commercial sources. At the close of the 94th Congress, this bill was with the Conference Committee to work out differences between House and Senate versions.

In April 1975, we testified before the Senate Committees on Interior and Insular Affairs and Commerce regarding the need for improved policies and procedures for the rational exploration and development of OCS fossil fuel resources. At that time, we endorsed the overall thrust of the legislation designed to improve the Government's ability to deal with OCS exploration and development problems.

In March 1977, we again testified before the House Ad Hoc Select Committee on the Outer Continental Shelf and the Senate Committee on Energy and Natural Resources about our review of Sale 35. We discussed at those hearings deficiencies in the OCS leasing program, particularly in tract selection and evaluation. We commented that the recommendations in our Sale 35 report were generally in line with the thrust of provisions in bills S.9 and H.R. 1614.

We believe our review of OCS Sale 40 has provided additional support that more geologic data is needed to reduce the risk associated with OCS resources development. Consequently, we recommend the Congress favorably consider this pending legislation.

APPENDIX I

HAMILTON FISH, JR.
25TH DISTRICT, NEW YORK

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KINGSTON OFFICE
292 FAIR STREET 12401
PHONE (914) 331-4466

Congress of the United States
House of Representatives
Washington, D.C. 20515

March 7, 1977

JUDICIARY COMMITTEE
SMALL BUSINESS COMMITTEE
SELECT COMMITTEE ON THE OUTER CONTINENTAL SHELF

WASHINGTON STAFF
JOHN D. RARRY
ADMINISTRATIVE ASSISTANT
MRS. AYA H. ELY
EXECUTIVE AND APPOINTMENT SECRETARY
JARED O. BLUM
LEGISLATIVE ASSISTANT
SHIRLEY CAVANAUGH
CASE WORKER

The Hon. Elmer B. Staats
Controller General of the
United States
Washington, D.C. 20548

Dear Mr. Staats:

Pursuant to a discussion between my staff and Monte Canfield, Jr., director of your Energy and Minerals Divisions, I should like to request that the General Accounting Office study and report to me on the Department of Interior Sale No. 40. This was the 1976 Outer Continental Shelf oil and gas lease sale offshore the mid-Atlantic States.

I would expect that this report would be prepared using the same methodology as your report EMD-77-19, dealing with OCS Sale No. 35, offshore Southern California, and in such a format that the information and conclusions of the two reports may be compared.

I would appreciate it if Mr. Canfield or a member of his staff would contact Charles Bedell or David Cahn, of the O.C.S. committee, at the earliest possible date regarding this request.

Thank you.

Sincerely,

Hamilton Fish, Jr.
Member of Congress

APPENDIX II

United States Senate

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
WASHINGTON, D.C. 20510

March 28, 1977

Honorable Elmer B. Staats
Comptroller General of the
United States
441 G Street, N. W.
Washington, D. C. 20548

Dear Mr. Staats:

As you may be aware, the Committee on Energy and Natural Resources is in the process of moving legislation on the Outer Continental Shelf. During hearings last week a GAO representative testified with regard to Lease Sale No. 35 and made suggestions to remedy defects which were uncovered.

Congressman Hamilton Fish, Jr., Ranking Minority Member of the House Ad Hoc Select Committee on the Outer Continental Shelf, requested on March 7th that the General Accounting Office undertake an immediate study of the Department of Interior OCS Lease Sale No. 40. I join in this request. It is particularly important to both the House and Senate because of the prospect of marking up this legislation within the next two months.

Thank you for your usual fine cooperation.

Sincerely,

Clifford P. Hansen
Ranking Minority Member

CPH:nfw

APPENDIX III

SURVEY DEFINITIONS OF

EVALUATION RELIABILITY CATEGORIES

USED IN SALE 40

A. Actual drainage is taking place or would be taking place when production facilities are established. Production data and/or test data available on offsetting wells. Good idea of reserves. Seismic data may be available, but not necessarily required.

B. Possible drainage and/or development. Less well control than Rating A. Structure may be confirmed by seismic data to some extent. Some idea of reserves.

C. No drainage involved. On trend with known production. Sufficient well control to establish stratigraphic trends and conditions. Sufficient evidence from either subsurface control or seismic to identify structure.

D. No production on trend. Sufficient well control to establish stratigraphic trends and conditions. Sufficient seismic control to identify structure.

E. No production on trend. Insufficient well control to establish stratigraphic trends and conditions. Sufficient seismic control to identify structure.

F. Stratigraphic and structural information poor, but some idea of structure should be known.

G. Insufficient stratigraphic and structural information. Very little opinion of actual value.

SURVEY DEFINITIONS OF

EVALUATION RELIABILITY CATEGORIES

USED IN SALE 35

A. Drainage and has excellent control, good data, with little (relative) uncertainty with regard to exploratory value.

B. Good knowledge and good well or geophysical control, may have some production data; part of evaluation has some doubt, especially if the exploratory portion is large.

C. Good knowledge of structure configuration and size; well control may be interpolated into tract to predict sand conditions, depth, and hydrocarbon potential; good knowledge of geologic risk.

D. Fair to good knowledge of structure configuration and size. Poor to no well control. Stratigraphic data may or may not be adequate to predict gross sand conditions and depth; fair to poor knowledge of geologic risk.

E. Poor to very poor well control, useful geophysical data sparse to non-existent, stratigraphic data poor. Poor knowledge of geologic risk.

APPENDIX V

JUN 1[illegible]

Honorable Abraham Ribicoff
Chairman, Committee on
Government Operations
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

On March 7, 1977, the Comptroller General issued a report to the Congress entitled "Outer Continental Shelf Sale #35 - Problems Selecting and Evaluating Land to Lease" (EMD-77-19). This letter is the Department's statement on actions taken regarding the recommendations set forth in that report, pursuant to section 236 of the Legislative Reorganization Act of 1970.

The report makes the following recommendations:

The Secretary of the Interior should take the following actions -

— Direct a geological exploration program which would provide for the development and implementation of a systematic plan for appraising Outer Continental Shelf oil and gas resources, including selected stratigraphic test drilling. The plan should identify the level of stratigraphic drilling necessary to provide a minimal level of data coverage for major OCS areas.

— After the plan has been developed, encourage private industry to conduct the drilling identified in the plan subject to the developed information being shared with Interior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bona fide potential bidder to "buy-in" on the exploration by paying a pro rata cost of the drilling.

  After the extent of industry participation is known, if any data gaps still exist, take the necessary actions including public financing of stratigraphic drilling, to obtain the needed data.

— In addition, after obtaining and evaluating the above information, should take the necessary steps to encourage industry to obtain further information after the tract selection process is completed. These additional activities should focus on the specific tracts selected and help develop reasonably sound information for prelease evaluation purposes. The results again should be shared with

APPENDIX V

Interior on a confidential basis. Exploration permits issued by the Department for private drilling should provide the opportunity for any bona fide potential bidder to "buy-in" on the exploration by paying a pro rata cost of the drilling.

After the extent of industry participation has been reviewed and evaluated by Interior, if any significant data gaps exist, take the necessary actions, including publicly financed stratigraphic drilling, to obtain data.

— Offer for lease sale only those areas for which the Department has collected and analyzed sufficient information to adequately identify where the resource is, its estimated value, and its potential for development in the near future.

— Require Survey and the Bureau to consider all necessary information and make final corrections to tract values prior to the sale being conducted.

In addition, Mr. Monte Canfield in his letter of March 7 states, "We recommend the Department promptly conduct any necessary cost-benefit analysis of a systematic exploration program. In conjunction with this analysis, we recommend that the policy restricting exploratory drilling on-structure be studied."

These recommendations follow from the basic idea that there may be benefit from improving the information available about the location, extent, and value of OCS oil and gas resources before the sale of leases. Improved prelease information will be of benefit to the extent that it contributes to the achievement of three closely related objectives:

1. Enhancing competition and assuring the public a fair return for its resources;

2. Promoting timely and efficient exploration and development of oil and gas;

3. Improving planning for efficient and environmentally sound national energy policy, for OCS lease sales and for associated onshore development.

The Department is committed to achieving these objectives and has supported amendments to the OCS Lands Act of 1953 to provide authorities that would facilitate the development and implementation of programs for these purposes including the authorities to offer permits for onstructure stratigraphic tests and to contract for exploratory drilling. In conjunction with Congressional consideration of these amendments, the Department is undertaking a broad review of alternatives for achieving these objectives.

Systematic plans for appraising OCS resources will be developed and evaluated as part of this review. The Department will implement programs identified as most promising in the course of the review. In doing so it will collect the data needed to further evaluate their performance and provide a basis for continued improvements in the OCS leasing program.

We recognize, however, that there may be other ways of achieving these same objectives that also deserve consideration. For example, it may be possible to improve competition and assure the public fair return by using bidding systems other than the cash bonus system used in Sale #35 and most other OCS lease sales.

In order to evaluate such alternatives, the Department is taking the steps necessary to develop and evaluate programs for improving prelease information on OCS oil and gas resources, and for improving the bidding systems used in the sale of leases. This will give us a broad range of options to choose from in improving the operation of the OCS leasing program.

Sincerely yours,

(Sgd) Jim Joseph

JAMES A. JOSEPH
UNDER SECRETARY

APPENDIX VI

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

MAR 7 1977

B-118678

The Honorable
The Secretary of the Interior

Dear Mr. Secretary:

In recent years, the General Accounting Office (GAO) has conducted several reviews of the Department of the Interior's Outer Continental Shelf (OCS) oil and gas leasing program pointing out the need for a systematic exploration plan including selective stratigraphic drilling.

In a June 30, 1975, report, "Outer Continental Shelf Oil and Gas Development--Improvements Needed In Determining Where To Lease And At What Dollar Value," we pointed to numerous problems in selecting and leasing tracts caused by the absence of adequate resource information necessary to protect the public interest. We recommended that the Department develop and implement a systematic exploration plan, including selective stratigraphic test drilling for resource appraisal. The Department, in commenting on this report, said that GAO had not presented a critical analysis on the cost effectiveness of such a program and stated the key unanswered question is whether the cost of an exploration program would increase in equal amounts the return to the Treasury.

More recently, we conducted an assessment of OCS Sale #35 off the Southern California coast and found that the same problems continued to exist. In a draft report furnished the Department for comment we again recommended the Department direct a geological exploration program which would provide for the development and implementation of a systematic plan for appraising OCS oil and gas resources. The Department, in its February 24, 1977, comments on this draft report, reiterated the posture of the previous Administration that obtaining additional data would be costly and that GAO had not provided a benefit-cost analysis.

EMD-77-29

APPENDIX VI

We believe that a responsible cost-benefit analysis cannot be done until the Department develops an appraisal plan; identifies the levels of stratigraphic drilling needed to assess the OCS; and determines the extent to which private industry is willing to perform such drilling. The benefits of stratigraphic drilling, although difficult to quantify, could be measured, to some extent, by industry's willingness to undertake such efforts under a positive comprehensive program developed by the Department. In any case, we believe it is the Department's responsibility to make such assessments, including a cost-benefit analysis. The fact the Department has not chosen to do so, in no way negates our argument that such a program could be beneficial to the public interest. We believe there is compelling evidence, as discussed in our report on OCS Sale #35, that the present system is inadequate to protect the public's interest.

We might also add that the question of whether the Federal cost of an exploration program would exceed the return to the Treasury is not the only reason for having a systematic exploration program. Another benefit would be the timely and orderly development of OCS resources in meeting the national goal of increased domestic energy sources. We believe that any cost-benefit analysis should consider benefits to be derived other than those accruing directly to the Treasury.

Another major factor affecting the knowledge of an OCS area is the Department's policy on exploratory drilling on-structure. Current policy allows corehole and deep stratigraphic testing by industry off of the geologic structures identified by the seismic data, but prohibits such testing on-structure.

Survey officials said this policy was implemented because (1) of the possible environmental hazards of exploratory drilling on-structure and (2) unsuccessful testing would be likely to lower total bonus receipts. This policy, however, becomes an all important factor when considering the limited information available for the unleased and unexplored frontier lands and the importance of discovering and developing new domestic oil and gas. Conducting on-structure tests could provide better and more reliable data and result in fewer off-structure tests being needed.

APPENDIX II

RECOMMENDATIONS

We recommend the Department promptly conduct any necessary cost-benefit analysis of a systematic exploration program. In conjunction with this analysis, we recommend that the policy restricting exploratory drilling on-structure be studied.

- - - - -

We would point out that no cost-benefit analysis can substitute for actual experience in the conduct of a federally developed exploratory program such as we have recommended in the Sale #35 report. We believe that the Department should initiate such a program now, conduct the cost-benefit studies simultaneously, and move expeditiously to answer unresolved questions based both on actual experience and studies. The evidence amassed over the past several years and presented in several GAO reports, including this most recent one clearly indicates to us, in any case, that a major change is in order, not just more study.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House and Senate Committees on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We would like to be informed of any action taken on our recommendations. If you wish, we would be glad to discuss this report with you or your staff.

Sincerely yours,

Monte Canfield, Jr.
Director

APPENDIX VII

PRINCIPAL OFFICIALS RESPONSIBLE FOR ADMINISTERING ACTIVITIES DISCUSSED IN THIS REPORT

DEPARTMENT OF THE INTERIOR	Tenure of office From	To
SECRETARY OF THE INTERIOR:		
Cecil D. Andrus	Jan. 1977	Present
Thomas S. Kleppe	Oct. 1975	Jan. 1977
Kent Frizzell (acting)	July 1975	Oct. 1975
Stanley K. Hathaway	June 1975	July 1975
Kent Frizzell (acting)	May 1975	June 1975
Rogers C. B. Morton	Jan. 1971	May 1975
ASSISTANT SECRETARY OF THE INTERIOR--ENERGY AND MINERALS:		
Joan M. Davenport	Apr. 1977	Present
William D. Bettenberg (acting)	Jan. 1977	Apr. 1977
William G. Fischer (acting)	Jan. 1976	Jan. 1977
Jack W. Carlson	Aug. 1974	Jan. 1976
King Mallory (acting)	May 1974	July 1974
Stephen A. Wakefield	Mar. 1973	Apr. 1974
John B. Rigg (note a)	Jan. 1973	Mar. 1973
Hollis M. Dole	Mar. 1969	Jan. 1973
ASSISTANT SECRETARY OF THE INTERIOR--LAND AND WATER RESOURCES:		
Guy R. Martin	Apr. 1977	Present
Christopher G. Farrand (acting)	Jan. 1977	Apr. 1977
Jack O. Horton	Mar. 1973	Jan. 1977
ASSISTANT SECRETARY OF THE INTERIOR--PUBLIC LAND MANAGEMENT (note b)		
Harrison B. Leosch	Apr. 1969	Jan. 1973
ASSISTANT SECRETARY OF THE INTERIOR--PROGRAM DEVELOPMENT AND BUDGET:		
Heather L. Ross (acting)	Jan. 1977	Present
Roanld G. Coleman	May 1976	Jan. 1977
Stanley D. Doremus (acting)	Feb. 1976	May 1976
Ryston C. Hughes	Feb. 1974	Feb. 1976
Laurence E. Lynn	Apr. 1973	Feb. 1974

APPENDIX VII

	Tenure of office	
	From	To
ASSISTANT SECRETARY OF THE INTERIOR--PROGRAM POLICY (note c)		
John W. Larson	Apr. 1969	Apr. 1973
DIRECTOR GEOLOGICAL SURVEY:		
Vincent E. McKelvey	Dec. 1971	Present
William A. Radlinski (acting)	May 1971	Dec. 1971
DIRECTOR BUREAU OF LAND MANAGEMENT:		
Curt Berklund	July 1973	Present
Burton W. Silcock	June 1971	July 1973

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a/ Deputy Assistant Secretary in charge.
b/ Became office of Assistant Secretary--Land and Water Resources in March 1973 reorganization.
c/ Became office of Assistant Secretary--Program Development and Budget in April 1973 reorganization.