BY THE COMPTROLLER GENERAL

# Report To The Congress

OF THE UNITED STATES

## Uncertainties Surround Future Of U.S. Ocean Mining

In this report, GAO reviews Federal Government, private sector, and foreign competitor involvement in ocean mining and examines whether there is a need to develop U S ocean mining policy

The Congress has identified mining of the deep seabeds as a desirable alternative to foreign markets However, uncertainties surround the future of ocean mining These uncertainties stem from the absence of (1) a clear legal basis to assure direct access to deep seabed minerals, (2) an assessment that evaluates U S vulnerability to supply interruptions of existing mineral markets, and (3) a policy decision of what the Federal role, if any, should be in promoting ocean mining

GAO is recommending that the office of Science and Technology Policy perform assessments of U S strategic and critical mineral needs and the costs and benefits of alternative approaches, including ocean mining, to reducing U S vulnerability to mineral source of supply disruptions GAO believes these assessments would benefit U S ocean mining policy by providing a framework for determining which of the approaches will require Federal assistance or intervention

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

Mining the deep seabeds is a potential source of minerals important to U.S. national interests and, according to the Congress, a desirable alternative to foreign markets. This report points out the need to further develop U.S. ocean mining policy and recommends certain assessments be made of U.S. vulnerability to supply interruptions in foreign mineral markets, comparative costs and benefits of alternative approaches to reduce or eliminate vulnerability, and whether Federal intervention will be required. Information that would be provided by such assessments would facilitate development of U.S. ocean mining policy.

Copies of this report are being sent to the Director, Office of Management and Budget; the Director, Office of Science and Technology Policy; the Assistant to the President for National Security; and the Secretaries of State and Interior. We are also providing copies of this report to appropriate congressional committees.

Charles A. Bowsher

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

# UNCERTAINTIES SURROUND FUTURE OF U.S. OCEAN MINING

## D I G E S T

By enacting the Deep Seabed Hard Minerals Resources Act of 1980 (P.L. 96-283), the Congress identified direct access to seabed resources as a desirable alternative source of supply to imported materials and authorized U.S. companies to mine in waters beyond national jurisdiction, pending U.S. acceptance of an international treaty. The availability of minerals and the instability of existing markets were a concern of the Congress when it passed the National Materials and Minerals Policy, Research and Development Act of 1980 (P.L. 96-479), which calls for assessments of materials demand, supply, and need. GAO undertook this review to report on the status of the Federal Government's involvement in ocean mining and to examine efforts to further develop U.S. ocean mining.

## OPTIONS FOR A LEGAL CLIMATE CONDUCIVE TO OCEAN MINING

In July 1982, the President announced that the United States would not sign the United Nations-sponsored Law of the Sea Treaty and was joined by 22 other countries in rejecting the Treaty when it was opened for signature in December 1982.

In its broadest terms, the Treaty attempts to settle the question of who owns the seas and it affects almost every aspect of maritime life--commercial, economic, military, and legal. The United States position on the Treaty was that most provisions of the draft were acceptable and consistent with U.S. interests but that major elements of the deep seabed mining portion were not. Chief among Treaty provisions objected to were mandatory transfer of private technology to an international enterprise provided for by the Treaty to do deep seabed mining, production ceilings, limits on the number of mine sites which could be operated by any one country, and participation by national liberation movements. The United States is seeking alternatives to the Treaty. Negotiations continue with several industrialized allies to create a network of mutual recognition of claims to deep seabed minesites, as authorized under P.L. 96-283.

This arrangement would be referred to as a Reciprocating States Agreement, if consummated. In recent unilateral action, the President proclaimed an Exclusive Economic Zone extending 200 nautical miles from U.S. coastlines in which sovereign rights will be exercised over living and nonliving resources. Recently discovered deposits within this area could be an important future source of supply of strategic and critical minerals. (See pp. 2, 3, and 7 through 12.)

## U.S. OCEAN MINING POLICY COULD BENEFIT FROM MARKET VULNERABILITY ASSESSMENTS

In April 1982, the President, in a report to the Congress, stated that the administration is seeking to reduce U.S. dependence on politically unstable foreign sources of mineral resources. However, ocean mining is an undeveloped and untested alternative to reducing U.S. vulnerability to supply disruptions and sharp price increases in foreign markets. (See p. 32.)

Responsibility for assessments of national materials needs has been assigned to the Office of Science and Technology Policy (OSTP). P.L. 96-479, previously mentioned, requires OSTP to make assessments related to science and technological concerns and changes. The Cabinet Council on Natural Resources and Environment established by Presidential statement in February 1982, was designated to coordinate a national materials policy. (See pp. 32 and 34.)

However, ocean mining policy within the context of a national nonfuel materials policy has not emerged from Cabinet Council activities. Also, OSTP has not undertaken assessments from which the policy should emerge. In terms of the legislative mandate and the President's April 1982 report, U.S. mineral needs should be measured, and comparative analysis should be made of alternative mineral sources to reduce vulnerability resulting from dependency on foreign sources for critical minerals. GAO recognizes that such assessments will require the resources, time, efforts, and expertise of several Federal agencies. However, the results should provide Government policymakers with a better basis to decide what, if any, assistance should be provided to private industry to promote ocean mining. (See pp. 35, 42 and 43.)

## STATUS OF AMERICAN OCEAN MINING AND VIEWS OF INDUSTRY OFFICIALS

U.S. ocean mining interests are nearly unanimous in their rejection of the Treaty but are uncertain about what the future holds. U.S. ocean mining activities stem from privately funded participation by four U.S. corporations in international deep seabed mining consortia which have successfully carried out exploration and prototype technology testing. The U.S. Government has not provided financial assistance or otherwise subsidized the development of ocean mining and industry spokesmen are divided on the need for such support. However, ocean mining spokesmen believe that a strengthened political/legal environment is needed before large-scale investment necessary to advance the technology of deep seabed mining becomes practicable. (See ch. 4.) The current focus of U.S. Government activity is directed toward negotiation of a Reciprocating States Agreement with seven industrialized countries; however, there is a question of the legal status of such an agreement in light of the broader United Nations-sanctioned Treaty. (See p. 13.)

Some ocean mining spokesmen believe that the United States has not devoted sufficient attention to developing a climate conducive to investment. As a result, some say that the United States will be squeezed out of ocean mining by competitors such as Japan and France, whose governments are playing an active role in creating and developing national ocean mining industries. (See p. 29.) The Japanese program spent approximately $47 million on exploration and research and development between 1976 and 1981. Beginning in 1981, a 9-year, $76.6 million program was begun and represents the first stage in the Japanese drive to develop a commercial ocean mining industry. The French Government, in 1982 alone, contributed $17 million toward its goal to create an all-French ocean mining industry. The United Kingdom and the Federal Republic of Germany offer only a small amount of government support. Belgium and the Netherlands prefer not to intervene in the private sector. (See ch. 3.)

## EXISTING U.S. LEGISLATION MAY PROVIDE SOME GUIDANCE IN DEVELOPING OCEAN MINING POLICY

There are a variety of existing laws generally enacted to aid land-based mining which provide

options such as federally guaranteed loans, direct loans, purchase contracts, maritime aids, and various forms of tax relief intended to mitigate some of the major economic risks involved in the development of new mineral supplies. If it is determined that the seabeds are an important alternative source for strategic and critical minerals, these laws may be used as a guide to developing policy for seabed mining. Should existing programs be considered appropriate vehicles for stimulating the development of U.S. ocean mining, the responsibilities of the Federal agencies that administer the programs will have to be coordinated.

## CONCLUSION

The United States took a strong stand on the Treaty but has not yet achieved an alternative to protect its ocean interests and provide an adequate framework in which direct access to the mineral resources of the deep seabeds can be assured. Negotiating an alternative legal arrangement will not, in itself, assure the development of ocean mining as an alternative source for critical and strategic minerals. The uncertainties of mining outside of the Treaty, the state of the art of U.S. ocean mining technology, and the competition from foreign programs highlight the need for comprehensive vulnerability assessments.

The information that would be provided by such assessments should facilitate development of U.S. ocean mining policy. The Federal Government would be in a better position to gauge how extensively ocean mining should be promoted and to formulate the Federal role, if any, on the matter of financial and other aid to private industry.

## RECOMMENDATIONS

GAO recommends that OSTP undertake comprehensive vulnerability assessments since, by law, it is responsible for short- and long-term assessments of national materials needs. At a minimum, the assessments should (1) measure the needs and the potential degree of U.S. vulnerability in a given market, (2) weigh the benefits and costs of alternative approaches to reducing or eliminating U.S. vulnerability, including ocean mining, and (3) help decide which strategic and critical minerals, if any, will require Federal intervention.

## AGENCY COMMENTS AND GAO'S EVALUATION

GAO requested comments from the Department of State, National Security Council, Office of Science and Technology Policy, and the Department of the Interior. The Department of State advised GAO that they reviewed the report but did not have any comments to make. The National Security Council did not provide comments. (See ch. 6.)

The Department of the Interior's primary comment was that the report places too much emphasis upon Presidential actions and the Law of the Sea Treaty and downplays the overall investment climate for minerals which offers little or no economic incentive to pursue mining of the deep seabeds at this time. However, it was not within the scope of GAO's review to evaluate the impact of the general economic situation on the minerals industry or on the ocean mining investment climate. Rather, the focus of GAO's report is on the status of ocean mining policy, and assessment of U.S. needs for strategic and critical minerals requirements and of sources of supply that should be developed to satisfy needs. This assessment should be undertaken prior to going forward with an operational program to gain direct access to the deep seabeds. GAO notes that the Department of the Interior did not disagree with the recommendation that these assessments be undertaken. (See p. 44 through 52.)

OSTP's position was that public policy statements by the administration represented clear national policy; for example, the President's announcement on six objectives deemed necessary to conclude the Treaty. GAO believes that the statements are clear on the matters they were intended to address, namely,the administration's position on the Law of the Sea Treaty. However, U.S. policy has not been developed to the point of formulating a position on what role, if any, the Federal Government should have in promoting ocean mining.

OSTP stated that it is aware of the importance of having dependable sources of critical and strategic materials, however, GAO found that the assessments mandated by P.L. 96-479 have not been done by OSTP. (See p. 45.)

# Contents

## ABBREVIATIONS

| | |
|---|---|
| DM | Deutsche Mark |
| EEZ | Exclusive Economic Zone |
| FRG | Federal Republic of Germany |
| GAO | General Accounting Office |
| IRS | Internal Revenue Service |
| MITI | Japanese Ministry for International Trade and Industry |
| NOAA | National Oceanic and Atmospheric Administration |
| OSTP | Office of Science and Technology Policy |
| RSA | Reciprocating States Agreement |
| UK | United Kingdom |

# CHAPTER 1

## INTRODUCTION

The Congress has expressed its increasing concern over the future availability of strategic and critical minerals to the U.S. national industrial base. In the 97th Congress alone, more than 35 bills were introduced to deal with at least one aspect of U.S. dependence upon imports of strategic and critical nonfuel minerals.[1] By enacting into law the Deep Seabed Hard Mineral Resources Act of 1980[2] (30 U.S.C § 1401 et. seq.) the Congress signaled its concern and its willingness to promote the goal of minerals self-surficiency. The 1980 Act was intended to facilitate the recovery of the mineral resources of the deep seabed while retaining an interim character pending U.S. adoption of an acceptable United Nations-sponsored treaty. The 1980 Act recognizes U.S. reliance on imports for several key minerals and states that it is in the U.S. national interest to achieve assured, direct access to strategic minerals. The deep seabeds are identified in the 1980 Act as a desirable alternative to land-based sources of supply.

### SEABED MINERALS AND U.S. NATIONAL INTEREST

The most prominent, near-term potential mineral resource on the world's deep seabed lies in manganese nodules. These nodules, found in varying concentrations in the Pacific, Atlantic, and Indian Oceans, contain large quantities of copper and zinc, in addition to manganese and other minerals. A commercial venture, operating over a 25-year period to recover 3 million tons of dry nodules per year, can, according to Congressional Research Service estimates, expect an annual yield of 42,000 tons of nickel, 37,000 tons of copper, 4,000 tons of cobalt, and up to 750,000 tons of manganese.

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[1] In a prior report, "Actions Needed to Promote a Stable Supply of Strategic and Critical Minerals and Materials" EMD-82-69, GAO found that: "The consensus among most risk assessments we reviewed as well as our energy-critical and strategic analysis indicate that a clear definition of the terms strategic and critical would show that the United States is most vulnerable in about a dozen nonfuel mineral and material markets, including aluminum ores (bauxite), chromium, cobalt, columbium (niobium), gold, manganese, nickel, the platinum group metals, tantalum, tin, titanium, and tungsten."

[2] Hereinafter referred to as the 1980 Act

The United States is heavily import-dependent for nickel, manganese, and cobalt. In recent years, the United States has imported about 98 percent of its cobalt, principally from Zaire; about 97 percent of its manganese, principally from Gabon and South Africa; and about 73 percent of its nickel, principally from Canada. In 1980, imports of these commodities alone totaled over 1 billion dollars. The three minerals have all been identified as critical materials under the Strategic and Critical Materials Stock Piling Act (50 U.S.C. § 98 et. seq.). Manganese is an essential component in iron and steel production. Cobalt is vital to the basic tools industry and in applications such as high-temperature resistant alloys for jet engines. Nickel is indispensable because it imparts corrosion resistance, strength, and other properties to alloy steel.

Manganese nodules represent only one of the possible new ocean mineral resources which may become commercially exploitable in future years. The newly discovered polymetallic sulfides lying along the oceanic ridges, some within the U.S. 200-mile limit, contain varying amounts of copper, silver, cadmium, iron, molybdenum, lead, tin, vanadium, zinc, gold, and platinum. (Seven of the 11 are strategic and critical according to the stockpile list.) "Polymetallic sulfides" is a popular term that has been given to metal-bearing minerals that have been collected from active volcanic areas of the ocean floor.

## U.S. DECIDES AGAINST THE LAW OF THE SEA TREATY

On July 9, 1982, President Reagan announced that the United States would not become a signatory to the Law of the Sea Treaty (hereinafter referred to as the Treaty) sponsored by the United Nations.

In its broadest terms, the Treaty attempts to settle the question of who owns the seas and it affects almost every aspect of maritime life--commercial, economic, military, and legal. For example, it covers the right of passage through, under, and over straits for international navigation. It permits every country a territorial zone of 12 miles and an economic zone of 200 miles. It addresses fishing rights, the continental shelves, and the exploration and exploitation of the oceans' resources beyond national jurisdictions.

The President's July statement was preceded by a series of events which cast serious doubt that the U.S. intended to sign. In March 1981 the President announced that his administration would undertake a comprehensive review of the draft Treaty to assure that it met U.S. interests. On January 29, 1982, he reported that the results of the review concluded that major

elements of deep seabed mining provisions were not acceptable and would have to be changed during the final (March 8-April 30, 1982) negotiating session in New York. At the conclusion of that session the United States voted "no" on the adoption of the final Treaty text because negotiating objectives had not been achieved.

These events presented the international community with a new set of considerations regarding the outcome of over a decade of Treaty negotiations. The United States position has (1) forced third world and other proponents to reassess the viability of the Treaty in the absence of U.S. participation, and (2) highlighted the need for the United States to formulate a workable national strategy to protect its ocean interests outside of the Treaty. In regard to the latter, a bill, H.R. 2853, was introduced in the 95th Congress to create a commission for a comprehensive oceans policy.

## THE 1980 ACT PROVIDES FOR A RECIPROCATING STATES AGREEMENT

The 1980 Act authorizes the President to negotiate reciprocal agreements with other nations possessing a similar domestic ocean mining law and agreeing to recognize seabed mine site claims and licenses authorized by other reciprocating states. This arrangement is referred to as a Reciprocating States Agreement (RSA).

At the time of the President's statement on the Treaty, discussions were underway between the United States, the United Kingdom (UK), the Federal Republic of Germany (FRG), and France in an effort to create a RSA for mining deep seabed mineral resources. Discussions are continuing, however, the scope of the RSA has become increasingly ambiguous over time. Although it began as an effort to enlist a group of like-minded states to conclude an interim set of arrangements--particularly the mutual recognition of claims to seabed minesites--it has come to mean different things to different countries.

We have identified three sets of perceptions regarding the RSA among different countries we visited:

--The "conventional" perception views the RSA as solely an interim measure to facilitate initial claims to the seabed until an acceptable treaty comes into force.

--Another perception sees the RSA as a kind of mini-treaty standing on its own which will compete with and eventually cripple the deep seabed portion of the Treaty.

--Finally, the RSA is perceived to constitute a parallel treaty which would operate concurrently with the Treaty.

These views were expressed by officials in various governments, and sometimes different perceptions were held within a single government.

Some countries recognized the RSA as merely an interim agreement to be superseded by the Treaty, and their intentions to enter into a RSA with the United States have been complicated by the President's July 1982 statement because of negative international implications. One foreign official mentioned that the President's statement will force his government to seek a scaling-down of the RSA to a bare-bones mutual recognition of claims so as to maintain some distance from the United States on the issue of the Treaty.

## OBJECTIVES, SCOPE, AND METHODOLOGY

This review was performed in accordance with our current standards for government audits.

The primary objective of this review was to examine the Federal Government's involvement in the development of ocean mining with a focus on existing policy and whether there was a need to clarify or expand such policy.

The report contains information on:

--the many Federal Agencies responsible for or potentially involved in ocean mining and whether any have asserted a leadership role in assessing its potential as an alternative source of critical and strategic minerals;

--existing or prospective international and national initiatives or arrangements for establishing a legal framework under which ocean mining can be pursued;

--the degree to which governments of several industrialized nations are involved in supporting the development of national ocean mining operations;

--the existing U.S. Government programs which may impact on the competitive position of potential U.S.-ocean mining companies; and

--the opinions of U.S. ocean mining officials concerning the environment in which the ocean mining industry may have to evolve.

We did not assess the reasonableness of the U.S. decision not to sign the Treaty.

Our work was conducted primarily at the Department of State and the National Oceanic and Atmospheric Administration (NOAA) where we interviewed responsible officials and reviewed their records to determine U.S. efforts to negotiate alternative ocean mining regimes. We also interviewed officials of 13 other agencies to ascertain the eligibility of U.S.-flag ocean miners for various U.S. Government incentive and subsidy programs. The agencies included the Maritime Administration; Department of Treasury; Office of Management and Budget; Internal Revenue Service; General Services Administration; Department of the Interior; Bureau of Mines; Federal Emergency Management Agency; National Security Council; Office of the U.S. Trade Representative; Department of Defense; Overseas Private Investment Corporation; and the National Aeronautics and Space Administration.

In addition, we interviewed industry officials from the following organizations involved or interested in U.S. ocean mining: Kennecott Copper Corp., Lockheed Missiles and Space Co., SEDCO Inc., and the American Mining Congress.

We also conducted field work in six foreign nations. France, UK, Belgium, Japan, FRG, and The Netherlands. In four of these countries, we interviewed officials of ocean mining corporations and a broad range of government agencies associated with ocean mining or the negotiation of alternatives to the Treaty. In France, events precluded us from directly contacting government or private industry officials. Instead, the U.S. Embassy answered questions which we provided. In Japan, officials of Japanese private ocean mining corporations declined to speak with us, stating they did not wish to risk compromising their companies' competitiveness. The Japanese Ministry for International Trade and Industry (MITI) spoke on behalf of Japanese industry since the industry largely works for MITI in the role of a contractor.

## CHAPTER 2

## OPTIONS FOR A LEGAL CLIMATE CONDUCIVE TO OCEAN MINING

The Congress has expressed, through legislation, its concern about the future availability of materials essential to national security, economic well-being, and industrial production. By passing the 1980 Act, Congress identified deep seabed minerals as a desirable alternative source for certain strategic and critical minerals--one that could assist the United States in becoming more self-sufficient in achieving an adequate and stable supply of such minerals. However, there are uncertainties surrounding the future of U.S. ocean mining because of the difficulties experienced in establishing a workable legal order, acceptable to the United States, to facilitate peaceful, international use of the oceans. The failure of the Treaty negotiations to satisfy basic U.S. requirements pertaining to unacceptable ocean mining provisions, the problems of negotiating a RSA, and the need to clarify U.S. ocean mining policy within the broader context of a national materials program, all have heightened the uncertainty whether U.S. companies with demonstrated potential to mine the deep seabeds will do so under a U.S.-flag industry.

At present, three principal approaches are being pursued by interested countries to establish a legal framework for ocean mining in areas of the high seas beyond national jurisdiction. Although each is capable of providing an adequate climate to foster the growth and development of U.S. ocean mining, the simultaneous existence of elements of these approaches could create conflict as discussed in parts of this and later chapters of the report.

These three approaches are the:

--Conclusion of the United Nations-sponsored Treaty, encompassing provisions for ocean mining, as well as other offshore activities, compatible with interests and principles of both industrialized and developing countries.

--Enactment of unilateral national legislation which may or may not be interim in nature.

--Establishment of a network of reciprocating states bound together under an executive agreement or other arrangements which may serve as either a transition or alternative to a comprehensive treaty.

COMPREHENSIVE LAW OF THE SEA TREATY

The long-awaited conclusion of the United Nations Conference on the Law of the Sea (hereinafter referred to as the Conference) resulted in the adoption of the formal Treaty on April 30, 1982. The Treaty, which was opened for signature in December 1982, contains over 300 articles and creates a new body of international law while at the same time codifying major aspects of traditional high seas freedoms.

The Conference, which has been meeting periodically since 1973, has drafted broadly accepted language for much of the Treaty, but major sections of the deep seabed mining provisions are unacceptable to the United States and some industrialized allies. The concern which the Reagan administration voiced over the Treaty draft upon coming into office led the administration to replace a significant segment of the U.S. delegation and suspend U.S. negotiating efforts while it conducted a year-long review of U.S. participation in the Conference. The review was directed to the degree to which the Treaty met U.S. interests especially in the areas of navigation, overflight, fisheries, environment, and deep seabed mining.

This review culminated in the Presidential statement on January 29, 1982 (previously mentioned on pp. 2 and 3) that most provisions of the draft were acceptable and consistent with U.S. interests but that major elements of the deep seabed mining portion were not. Six goals deemed necessary to be achieved in the deep seabed mining provisions before the Treaty could be supported by the United States were announced by the President who stated that:

" * * * we will seek changes necessary to correct those unacceptable elements and to achieve the goal of a treaty that:

--Will not deter development of any deep seabed mineral resources to meet national and world demand;

--Will assure national access to these resources by current and future qualified entities to enhance U.S. security of supply, to avoid monopolization of the resources by the operating arm of the International Authority, and to promote the economic development of the resources;

--Will provide a decisionmaking role in the deep seabed regime that fairly reflects and effectively protects the political and economic interests and financial contributions of participating states;

--Will not allow for amendments to come into force without approval of the participating states, including in our case the advice and consent of the Senate;

--Will not set other undesirable precedents for international organizations; and

--Will be likely to receive the advice and consent of the Senate. In this regard, the convention should not contain provisions for the mandatory transfer of private technology and participation by and funding for national liberation movements. * * * "

Other concerns were that the Treaty reflected a protectionist bias, discriminated against free enterprise, and was contrary to broader U.S. interests. Chief among these were production ceilings, and limits on the number of mine sites which could be operated by any one country. Also, concern about the constitutionality of the Treaty was raised by the possibility that certain future amendments to the Treaty would be binding even if the United States voted against them or the Senate did not give its consent.

The U.S private sector was concerned that certain provisions affected the long-term stability and economics of deep seabed mining. It argued there would be no absolute assurance that once the first miners completed necessary research and development, they could build a commercially viable system and operate it under initially established terms and conditions over the long-term (20 years or more). Other provisions that the private sector saw as affecting the financial aspects of ventures included mandatory technology transfer, and a requirement that private sector miners provide information (to the international "enterprise" the Treaty creates to do deep seabed mining) on a minesite of equal value to their own site(s).

The U.S. delegation had a difficult task in returning to the eleventh session of the Conference (March 8 - April 30, 1982)--billed as the final negotiating session--to renegotiate elements of the Treaty necessary to achieve the President's stated objectives. When the Conference opened, the U.S. delegation presented a list of general principles for consideration. These were promptly rejected, however, by the Group of 77 (a coalition which now includes over 110 third world countries organized into a fairly cohesive voting bloc) which demanded a listing of specific word change amendments to the text, arguing that the time for the negotiation of basic principles had long since passed. The U.S. delegation prepared what became known as

the "Green Book", a compilation of over 100 proposed amendments. This, too, was rejected as a basis for negotiation--the Group of 77 insisting that the proposed amendments would affect the basic character of the Treaty and were thus unacceptable.

Negotiations between the United States and the Group of 77 continued through intermediaries for the balance of the Conference. The primary set of intermediaries known as the Group of 11 (Australia, Austria, Canada, Denmark, Finland, Iceland, Ireland, New Zealand, Norway, Sweden, and Switzerland) offered numerous compromise texts, but they were largely ineffective in an atmosphere of increasing polarization.

On April 30, 1982, the last day of the Conference, the leadership attempted to have the Treaty adopted by consensus but the United States exercised its right to have the Treaty, as a whole, put up for a two-thirds vote. The final outcome was 130 in favor, 4 against, with 17 abstentions. The four states voting against adoption of the treaty were the United States, Israel, Turkey and Venezuela. The 17 abstentions were cast by the UK, FRG, Belgium, The Netherlands, Luxembourg, Italy, Spain, Thailand, and the Soviet bloc with the exception of Romania.[1] Two countries with major potential for ocean mining--France and Japan--voted in favor of the Treaty.

Upon the conclusion of the Conference, the United States began another review of the outcome of the negotiations, the results of which were announced by the President on July 9, 1982, when he stated:

> " * * * Our review recognizes * * * that the deep seabed mining part of the Convention does not meet United States objectives. For this reason, I am announcing today that the United States will not sign the Convention as adopted by the Conference, and our participation in the remaining Conference process will be at the technical level and concerned with those provisions that serve United States interests. * * *"

The full impact of the U.S. decision to reject the Treaty as a viable option may take several years to appear. The ultimate impact will in large part be determined by the success of the United States in establishing workable alternative arrangements. The view of pro-Treaty factions is that time and political pressure are on their side and that eventually the United

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[1]Of the 17 countries abstaining, all but Belgium, FRG, Italy, Luxembourg, Spain and the U.K. signed the Treaty ir December 1982.

States will find that it can adequately protect its ocean interests only through the comprehensive Treaty. Another view is that although the current U.S. administration will not sign the Treaty, it is very possible that a future President will reverse the current U.S. position. Underlying this speculation is the assumption that the United States will fail in its attempts to establish a viable alternative.

ENACTMENT OF UNILATERAL LEGISLATION

On June 28, 1980, the United States set the standard for the enactment of unilateral national ocean mining legislation when the President signed into law the 1980 Act. This legislation is replete with stipulations that testify to its interim nature, as it is to be superseded by the conclusion of a comprehensive United Nations-sponsored treaty to which the United States is a party. It, nevertheless, represented the first legislative assertion by any country of a national right to exploit the mineral resources of the deep seabed beyond national jurisdiction.

The 1980 Act authorized the Administrator of NOAA to issue licenses to eligible U.S. citizens for the exploration of deep seabed hard mineral resources and permits for the eventual commercial recovery of such minerals. The 1980 Act also authorized NOAA, in consultation with the Secretary of State and the heads of other appropriate departments and agencies, to designate as reciprocating states those nations which establish and regulate seabed mining programs which are compatible with and recognize the U.S. program.

The U.S. law was quickly followed by similar interim legislation in the FRG with the "Act of Interim Regulation of Deep Sea Mining" (August 1980); and the UK with the "Deep Sea Mining (Temporary Provisions) Act of 1981" (July 28, 1981). On December 23, 1981, France added its name to those governments having passed domestic ocean mining authorizations with the enactment of Law Number 81-1135 "Exploration and Mining of Major Seabed Resources" followed by the Japanese "Law on Interim Measures for Deep Seabed Mining" in July 1982.[2] There are a number of similarities and differences between the ocean mining laws of all five countries. Some of the major points include:

--Exploration rights are granted by license.

--Recovery is authorized by permit.

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[2]The Soviet Union announced enactment of domestic ocean mining legislation in April 1982.

--All countries but Japan prohibit recovery before January 1, 1988.

--Sovereign jurisdiction over the seabed is not asserted.

--Applications filed and authorizations granted by foreign nations with a similar ocean mining law will be recognized if such nations are designated as reciprocating states.

--Exclusivity of rights in carrying out recovery activities will be recognized.

--The marine environment is to be preserved.

--With the exception of France and Japan, all have provisions for the establishment of a trust fund which shall be set aside for foreign aid purposes or transfer to an International Seabed Authority[3] upon accession to the Treaty.

--Only the United States and France have flag state requirements for vessels used in mining. Whereas the United States requires that the mining ship plus one ore transporter be U.S.-flag vessels, France requires that all ships and airplanes used in nodule operations be of French registry.

--Only France maintains a quantitative restriction upon the number of minesites that may be claimed.

A recent announcement by the United States brings new focus on unilateral action under the 1980 Act. On March 10, 1983, the President proclaimed a U.S. Exclusive Economic Zone (EEZ) contiguous to the territorial sea. In his statement establishing the EEZ, the President stated the United States "will exercise sovereign rights in living and nonliving resources of the seabed, subsoil, and superjacent waters within 200 nautical miles of its coast." The President's action establishes jurisdiction out to 200 nautical miles for mineral resources that are not on the Continental Shelf. The area contains recently discovered deposits such as polymetallic sulfides and cobalt-manganese crusts which could be an important future sources of strategic minerals.

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[3]An organization to be created under the provisions of the Treaty to govern the deep seabed mining. All signatory nations to the Treaty are members of the Authority.

The Treaty, as previously discussed, also provides for a 200-mile economic zone and in fact, 56 countries have claimed 200-mile EEZs prior to the President's proclamation.

## RECIPROCATING STATES AGREEMENT

The RSA is a negotiating effort between the United States and several industrialized allies to secure a limited international agreement to facilitate ocean mining until an acceptable treaty comes into force. The proposed agreement calls for a system of mutual recognition of claims to deep seabed minesites. In addition, the RSA would make more compatible national regulatory procedures for ocean mining activities and establish a system of conflict resolution.

Since the 1980 Act became law, the United States has been engaged in negotiations to create a RSA with several key states involved in ocean mining either through direct government programs or private corporate participation in one of the seabed mining consortia. These countries are: the UK, FRG, France, Italy, Belgium, The Netherlands, and Japan. In addition to the United States, four countries (UK, FRG, France, and Japan) have passed domestic legislation which facilitates reciprocating state agreements, while Belgium and Italy are currently considering legislation. Although not a participant in the RSA negotiations to date, the Soviet Union may be eligible for designation as a reciprocating state if its April 1982 legislation is compatible with that of other countries.

A basic negotiating text was agreed to in January 1982 between the U.S., UK, FRG, and France, but a last-minute disagreement with the French over the physical size of minesites prevented signing an agreement at that time. The United States attempted to press ahead and sign the agreement with the FRG and the UK, but these countries balked, fearing an adverse reaction from Conference participants if an agreement was signed on the eve of the eleventh session of the Conference in March 1982.

### Prospects for achieving a RSA

Negotiations over an acceptable RSA are continuing with the same key states listed above and some progress has been made. For instance, a conflict resolution agreement was achieved in late July among the United States, FRG, UK, and France; however, the acceptance of the RSA itself is still an open question. We were told by various government officials of the foreign countries which we visited that the future of the RSA has been clouded by the United Nations vote in April to adopt the Treaty and was made more uncertain by President Reagan's July 9 announcement that the United States will not be a signatory to the Treaty. These officials explained that the effect of the U.S. statement was to undermine the diplomatic

positions of those participants in the RSA negotiations who were undecided about signing the Treaty.[4] They went on to say that if their governments signed a RSA, which the U.S. announcement has made to appear more like a permanent rather than an interim arrangement, then there could be a backlash from supporters of the Treaty. Many of the officials stated that the RSA will have no legal standing in the face of a much broader United Nations-sanctioned Treaty. They believed that the Conference leaders will quickly seek an advisory opinion from the International Court of Justice as to the legal status of any ocean mining exploitation conducted outside of the Treaty and that the court will likely rule in favor of the Treaty.

Other officials stated they will seek a scaled down RSA from one of the early proposals for a broad framework containing production standards, requirements for demonstrating mining intentions, penalties for environmental damage, mutual recognition of minesite claims, etc., to a simple mechanism limited to the mutual recognition of claims until an acceptable Treaty comes into force.

A number of foreign government and corporate officials expressed the hope that the United States will participate in future Treaty discussions, including the meetings of the Preparatory Commission which will write the rules and regulations. Some of these officials speculated that if the Treaty proves too burdensome for ocean miners to operate commercially, then the Conference will eventually renegotiate the ocean mining provisions. This speculation finds some support among officials of countries who feel the Treaty will be ineffectual unless the U.S. and other Western nations agree to abide by its provisions. However, this speculation is presently difficult to envision given the current hard line stand of Treaty supporters.

Some officials also predicted that if the United States remains outside of the Treaty while others operate under its aegis, it will not be possible for a U.S.-flag ocean mining industry to develop. Other officials, however, were concerned that the United States might remain outside of the Treaty and find a way to conduct ocean mining parallel to the Treaty organization. These officials expressed the view that the potential for conflict and confrontation will be very high in such a situation.

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[4]Of the countries the U.S. has been regularly consulting regarding the RSA, three--France, The Netherlands and Japan--have signed the Treaty as of the date of this report.

In our discussions with foreign government officials,[5] it was apparent that their respective governments do not relish the idea that U.S. ocean miners may attempt to establish subsidiaries abroad and operate under the Treaty through host country sponsorship. France and Japan are the least receptive to the possibility of providing U.S. corporations with a means to compete directly with their national ocean mining programs. In addition, some governments fear discrimination against their ocean mining applications by the International Seabed Authority if they are seen as providing the United States entry into ocean mining without signing the Treaty.

Another major problem involves the potential conflict over the legal competence of a sponsoring state to enforce compliance with the Treaty upon subsidiaries of foreign corporations. It is very possible that, in view of disputes such as the one over U.S. technology and the Soviet natural gas pipeline, states may wish to steer clear of placing themselves in the position of having to enforce an International Seabed Authority edict to transfer a "sensitive" technology used in ocean mining and owned by a U.S. corporation. It is difficult to envision the United States allowing a foreign government to mandate the transfer of a U.S. corporation's technology to a third country or organization. The sponsoring state could, thus, find itself in a position of having to choose one of three directions,

--circumvent Treaty provisions by not enforcing terms upon miners that it sponsors,

--withdraw its sponsorship of U.S. corporations refusing to comply, or

--enter into direct confrontation with the United States on the technology transfer question.

Although the Soviet pipeline issue has been concluded, sponsoring states will probably reflect on the potential for such problems before chartering foreign subsidiaries.

## CONCLUSIONS

The outcome of current U.S. efforts to secure an adequate alternative treaty for the conduct of ocean mining are very uncertain, although negotiations are currently ongoing. Given that the United States has rejected the Treaty, we considered two other potential scenarios in this review: (1) the RSA, which is currently tentative; and (2) unilateral action by the

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[5]Except for France where U.S. Embassy officials provided the government perspective as previously discussed on p. 5.

United States, which will entail substantial political and economic costs. Although the United States took a strong political stand on the Treaty, it has not yet achieved an alternative which would protect its ocean interests and provide an adequate framework in which direct access to the mineral resources of the deep seabed can be assured. Negotiating a legal arrangement will not, by itself, assure the development of ocean mining as an alternative source for critical and strategic minerals. Issues and problems concerning the prospects for achieving an ocean mining industry demonstrate the need for a clear U.S. ocean policy preceded by comprehensive assessments which include measuring U.S. vulnerability in markets for the known minerals of the deep seabeds; weighing the benefits and costs of alternative approaches to reducing or eliminating vulnerability; and deciding which, if any, alternative sources will require federal intervention to develop. (This subject is covered later in chapter 5.) If the results support the development of U.S. ocean mining, it is incumbent upon the Government to achieve a workable alternative legal framework to protect U.S. ocean mining interests.

## CHAPTER 3

## OCEAN MINING ACTIVITIES OF FOREIGN GOVERNMENTS

Several foreign governments are playing an active role in the creation and development of a national ocean mining industry. The extent of government involvement in encouraging a national flag industry varies greatly among the six countries we visited. For example, Japan and France are the most active, with the FRG, UK, Belgium, and The Netherlands following in descending order. To some extent, the degree to which a government is directly involved in subsidizing the creation of a national ocean mining industry influences that nation's attitude toward the acceptability of the Treaty and its enthusiasm for alternative regimes.

The French and Japanese intended to sign the Treaty although several elements were viewed as objectional. Officials in the FRG, UK, and The Netherlands, although strongly critical of the Treaty, were noncommittal regarding signature.[1] The Government of Belgium formally announced in September that it will not sign the Treaty. Except in Japan and France, industry officials found serious problems with the mining provisions of the Treaty stating that these provisions actually discourage commercial activity. These officials stated that they could not envisage commercial mining taking place under the current Treaty. Several governments expressed hope that the United States would exercise strong leadership in effecting changes to the Treaty or constructing a viable alternative.

### JAPAN STRONGLY COMMITTED TO BUILD AN OCEAN MINING INDUSTRY

The Japanese Government offers the strongest example of involvement in directing and financing the development of a national ocean mining industry. This involvement stems from the importance this resource-poor nation attaches to diversifying its mineral supplies, and the unfavorable investment climate created by the current Treaty.

According to the Japanese Foreign Ministry, the government made the decision to subsidize the industry because the requirements of the ocean mining provisions of the Treaty are so

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[1]Subsequent to our visits to these countries, the Treaty was signed by France and The Netherlands on December 10, 1982 (the United States and 22 other countries did not sign) and by Japan on February 7, 1983.

burdensome[2] that they would prevent the private sector from undertaking ocean mining. As a result, subsidies have been deemed vital to promote what the government considers to be an extremely important industry. Officials of the Ministry of International Trade and Industry (MITI) stated that substantial improvement in the Treaty would have to be made before the "free market" could foster the development of an industry. The Japanese Government officials viewed the financial burdens placed upon corporations by the Treaty as so onerous as to preclude private participation unless the government agrees to pay the various fees assessed miners under the Treaty.

Structure of Japanese Government involvement

The government controls all aspects of ocean mining research and development within Japan and MITI has overall responsibility for the program. The Metal Mining Agency of Japan administers MITI's ocean mining operations which are performed by corporations on a contractual basis for the government. The principal private entity carrying out the work for the government is the Deep Oceans Minerals Association, a loose association of 17 Japanese corporations.

The government has spent large sums of public money to date on ocean mining research and development and initiated a very ambitious program which began in 1981. Between 1976 and 1981 the Metal Mining Agency of Japan spent over 1.2 billion yen ($4.6 million in 1981 dollars) for nodule exploration. Between 1975 and 1981, the Metal Mining Agency spent over 11 billion yen ($42 million) on nodule technology research and development. Beginning in 1981, the government authorized a 9-year 20 billion yen ($76.6 million) program for developing machinery and equipment for the recovery of nodules. This program represents the first stage in the Japanese drive to develop a commercial ocean mining industry.

Japanese Government officials told us that the government will own all the plant, data, and equipment developed under its programs. Current plans call for developing an industry up to the commercialization stage at which time the government will select private operators from its heavy industries to proceed through commercialization. The result will be an eventual commercial enterprise immune from the risks of investing in an unproven technology and one whose financial obligations to an International Seabed Authority will be assumed by the government. These officials have stated that their eventual goal is to create an all-Japanese ocean mining industry which is capable of operating in any political/economic climate.

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[2]These obligations include: application fees, annual fees to mine, royalty payments, revenue sharing, and the training of foreign nationals in the techniques of ocean mining.

Another mechanism available to the Japanese for alleviating the negative investment climate of the Treaty is government-subsidized political risk insurance. The Metal Mining Agency administers political risk insurance and mining financing insurance, both of which require the payment of relatively small premiums at rates much lower than commercial insurers require.

Japanese Government attitude toward the Treaty

The Japanese Foreign Ministry told us that the government has some problems with the current Treaty text, such as the financial burden imposed upon miners, but these were not sufficient to prevent signing. Ministry officials predicted at the time of our visit that Japan would be among the first group of nations to sign but only if other major developed nations did so. The Ministry officials said that if the United States refused to sign, then Japan would rely upon France or perhaps UK or the FRG to take the lead. (Japanese confidence that France would sign proved justified.)

The Japanese Government officials we spoke to question the RSA as a viable option in light of the existing Treaty. They feel that the two are mutually antagonistic and cannot coexist without the potential for conflict. They feel that if the United States does not go along with the Treaty it will face serious challenges in the exclusive economic zone and in international straits. For example, coastal states may try to require advance notification of warship transits of their territorial sea currently prohibited under Article 21 of the Treaty. These officials view this possibility as very damaging to large ocean-going navies, such as the U.S. Navy. According to the Japanese Foreign Ministry, although the United States may be able to cope with these problems through a series of bilateral agreements or by other means, the Japanese Government cannot afford the luxury of such an option. Japanese Government officials assert that the government's interests cannot be secured outside of a single comprehensive treaty because Japan does not have diplomatic or military resources comparable to those of the United States.

The Japanese Government maintains that the possibility of the U.S. Government providing financial assistance to American ocean miners to stimulate the development of an industry operating outside the Treaty would inject uncertainty into the issue of title to minesites, resulting in potential conflict. Some Japanese officials believe that even if the United States does not go along with the Treaty at the outset, it will eventually reverse itself and join the Treaty signatories.

Japanese Government attitude toward sponsoring foreign miners

The Japanese ocean mining legislation does not allow for the recognition of foreign ocean miners under the Japanese flag.

The legislation recognizes only Japanese nationals as eligible for filing ocean mining claims, etc., under Japanese law. According to the Foreign Ministry spokesman, the legislation was passed solely to assist the Deep Oceans Minerals Association. Even two Japanese corporations, Sumotomo and Mitsubishi, due to their association with foreign miners through their membership in an international consortium, would not be eligible under this law to file a claim to a minesite.

## FRANCE, TOO, IS STRONGLY COMMITTED

The Government of France, like Japan, is substantially subsidizing the creation of a national ocean mining industry. French involvement stems from several factors, including the desire to be in the forefront of ocean research and deep ocean technology; the need to ensure stable access to overseas mineral supplies; the exposure of French overseas holdings to expropriation/retaliation in third world nations; and the belief that the Treaty does not provide a climate conducive for private commercial mineral exploitation.

### Structure of French involvement

The French Government directs and finances virtually all ocean mining research and development activities in France through the Association Francaise Pour l'Etude et la Recherche des Nodules, an all-French ocean mining consortium. The Association is controlled and funded almost exclusively by the French Government with some limited participation by private industry. The government's role in the consortium is represented by the Centre National Pour l'Exploitation Des Oceans and the Commissariat De l'Energie Atomique. Together these two agencies account for about 80 percent of the Association's holdings. A third agency, the Bureau des Recherches Geologiques et Minieres dropped out of the Association because it does not consider ocean mining to be economically worthwhile in the near term. Two private corporations account for the remaining shares of the Association--Societe Le Nickel and Chantiers de France-Dunkerque. These two companies have only a minor role in the consortium in terms of funding and management influence.

The French Government contribution to the Association in 1982 was $17 million, but it is unclear what funding levels will be in the future as the Association is in the process of a major reorganization. Embassy officials in Paris told us that the Association is being switched from an exploration mode to an exploitation/commercialization goal.

Some indications of the eventual size and scope of the French ocean mining program may be gleaned from related initiatives which the French have recently undertaken. In 1975 for instance, France established a national minerals stockpile. To implement this program, over 5 billion francs (over $750 million

at August 1982 exchange rates) have been allocated for purchases over the period 1975-1985. In 1981 alone, 1.6 billion francs were made available (approximately $235 million). We were told that the French Government's commitment to ocean mining can be compared to its commitment to the Concorde supersonic airplane project of the 1970s. This comparison is meant to illustrate their determination in seeking a position as the leader of technical advancement, regardless of the cost.

French Government attitude toward the Treaty

France signed the Treaty on December 10, 1982, but gave notice that ratification was contingent upon obtaining improvements through the process established (the Preparatory Commission) to draft implementing regulations later this year. Observers in many countries felt that by signing the Treaty, the French hoped to earn the good will of the third world as one of the few developed nations genuinely concerned with less developed countries' interests. Officials attributed the French position, in part, to concerns over the vulnerability of French overseas investments in third world countries and initiatives to protect French ocean miners, through subsidies, from the unfavorable investment climate created by the Treaty.

According to U.S. and foreign officials, France created obstacles to the establishment of a RSA by continuing to insist upon amendments unacceptable to the United States as the price of its signature. The French Government's prime objections to the RSA lie in the size of minesites allowed (150,000 square kilometers as opposed to 75,000 square kilometers which the French favor) and its insistence that the number of minesites be limited to one per RSA signatory.

French Government attitude
toward sponsoring foreign miners

According to the U.S. Embassy in Paris, it is unlikely that the French would be willing to allow foreign miners to operate under the French flag, or that the Association would take in a non-French partner. This attitude stems from French reluctance to encourage competition to its national program; the limited number of likely minesites to be awarded by the International Seabed Authority which may restrict states to no more than one minesite; and French unwillingness to provide a backdoor entry into ocean mining for states not signatories to the Treaty.

ACTIVITIES AND ATTITUDES OF
OTHER COUNTRIES VISITED

The extent of government involvement by other countries that we visited is far less intensive than Japan and France.

Their philosophies about providing assistance to build an ocean mining industry, as well as their import-dependence on minerals, differ to some degree. All have problems with the Treaty but also expressed some pessimism about concluding a RSA.

## UNITED KINGDOM

The UK Government has played a very limited role in the encouragement of a national ocean mining industry because, in the opinion of UK officials, their focus is on world trade for virtually all raw materials, and they are confident about their ability to secure adequate supplies on the world market. In the opinion of several UK officials, ocean mining undertaken by any nation will also benefit the UK. Generally, as more minerals enter the market, sources of supply become more diversified. Thus, the UK sees no near-term need to finance or otherwise promote the development of a national ocean mining industry.

### Structure of UK involvement

The thrust of UK ocean mining activity is confined to the investments made by three corporations: British Petroleum, Consolidated Goldfields, and Rio Tinto Zinc. These companies, all members of the Kennecott Consortium, told us that they receive no government money or backing at this time. In 1974, however, the government provided a loan to Consolidated Goldfields and Rio Tinto Zinc to assist them in buying into the Kennecott Consortium. This loan of 830,000 pounds (approximately $1.6 million in 1974 dollars) was made under the UK Science and Technology Act of 1965, to encourage and assist ocean mining research and development. The loan is repayable only if the project leads to commercial production. In addition, the loan stipulates that UK customers would have the first option to purchase any minerals produced. Although the UK has no plan for providing financial support to ocean miners, one UK official stated that the government attitude toward subsidies may change if industry could show that the national economy would be benefited through increased domestic employment, etc. Industry officials insisted that their companies are not as concerned with the strategic importance of these particular minerals as they are with their ability to deliver minerals at a profit. They stated that subsidies are proper if governments (such as France and Japan) are in need of direct access to certain minerals.

### UK Government and industry attitude toward the Treaty

At the time of our visit, UK officials were noncommittal on whether the UK would sign the Treaty pending a formal review. An official spokesman of the Foreign and Commonwealth Office stated that although there were some problems, the UK could accept the current Treaty. However, as of the date of this report, the UK has not signed.

UK Government officials were very pessimistic about the possibility for concluding a RSA with the United States due to the rejection of the Treaty by the United States. One official stated that President Reagan's announcement not to support the Treaty vastly complicated the RSA negotiations. He questioned how the RSA can be considered interim by those countries hoping to sign the Treaty when the United States is viewed as promoting the RSA as a final solution. He stated that, at a minimum, the RSA would have to be much narrower in scope and possibly limited to the mutual recognition of claims if it is to be achieved at all.

UK industry officials expressed a strong anti-treaty view. According to these officials, the current Treaty is a deterrent to investment and the thrust of the mining provisions militates against the basic commercial, profit-motivated philosophy of the mining industry. The concerns of UK firms, in general, parallel those expressed by U.S. industry.

UK attitude toward sponsoring foreign miners

UK officials stated that no restrictions would be placed upon U.S. firms operating under UK law through UK subsidiaries, however the UK will not go out of its way to encourage such activities. The UK sees little benefit to be gained for their economy by sponsoring a U.S. ocean miner.

FEDERAL REPUBLIC OF GERMANY

The FRG depends upon imports for many of its raw materials and is interested in diversifying its sources of supply to limit the risk of interruption. The FRG believes that private industry, through market forces, is the proper mechanism for ensuring that necessary resources are obtained. The FRG, however, has consistently supported the activities of industry where necessary.

The FRG has been involved in providing assistance to ocean miners since 1970. From 1970 through 1982 approximately 80 million Deutsche Marks (DM) ($26.7 million in 1975 dollars) was made available by the FRG mostly in the form of grants. Significant economic importance has been ascribed by the government for German corporations to develop technology for ocean mining, not only because of security of supply concerns, but also from the standpoint of remaining in the forefront of deep ocean technology. The determination of the FRG to be in the forefront of this branch of ocean technology has its limits, however. An Economics Ministry official told us that the FRG considers the creation of a government sponsored or financed enterprise as out of the question.

Structure of FRG involvement

Government assistance to ocean miners has taken two forms--exploration promotion loans, and research and technology grants. The exploration loan program, under the aegis of the Ministry of Economics, provides interest-free loans which defray the costs of exploration and are only repayable in the event of successful mining. This program, which began in 1971, normally provides up to 50 percent of the costs of exploration, but for particularly "worthy" projects, up to two-thirds can be funded. For projects involving the development and testing of new equipment and methods up to 75 percent financing can be obtained. An Economics Ministry official told us that since 1972 only DM 6 to 7 million ($1.9 to $2.3 million) has been allotted to ocean mining; this compares with a total obligation under the program through 1979 of DM 184 million ($59.9 million).

The awarding of research and technology grants has been the FRG's primary conduit for supplying government funds to ocean miners. Over the period 1970 to 1979, approximately DM 65 million ($21 million in 1975 dollars) in direct grants has been awarded to ocean mining. This figure, however, represents only a small proportion of the overall research and technology grant program administered by the Ministry of Research and Technology. An Economics Ministry official told us that the 1982 budget for the Ministry of Research and Technology is DM 128 million ($50.4 million) of which DM 49 million ($19.3 million) was allocated for marine technology. Of the latter amount, only DM 7 million ($2.8 million) was for nodule mining. According to this official, this demonstrates the relatively low priority placed upon ocean mining in the overall Ministry of Research and Technology program.

FRG Government and industry attitude toward the Treaty

The FRG Government was split on the issue of whether to sign the Treaty. The Economics Ministry was strongly opposed to its mining provisions and favored rejection of the Treaty. A Ministry official stated that the mining provisions were a "new form of protectionism" for land-based, mineral-producing countries in particular, and the third world in general. A Foreign Ministry official stated that his Ministry was also opposed to the mining provisions, but they had to take a broader view. He stated that in the context of its full scope, the Treaty was acceptable to the FRG, especially if the mining provisions were improved. He also stated that if in fact the FRG became a signatory and improvements were not subsequently made, the government could always refuse to ratify the Treaty. The FRG has not signed as of the date of this report.

FRG intentions regarding the RSA are still unsettled. The RSA has always been viewed by the FRG as an interim arrangement but now that the United States has opted out of the Treaty, FRG

officials feel that the United States is intent upon making the RSA permanent. The Economics Ministry official stated that the FRG is still keeping its options open regarding the RSA and noted that they still have some time before having to make a firm decision.

Spokesmen for German ocean miners told us that they have urged the government not to sign the Treaty and cited most of the same objections to the Treaty enumerated by President Reagan.

BELGIUM

The Government of Belgium is one of the two European countries we visited which have not provided state funding for ocean mining; The Netherlands is the other. This fact, however, should not detract from the importance which Belgium places upon the establishment of such an industry. Indeed, Belgium has a draft ocean mining law patterned after those of other European countries ready to submit to its Parliament. In September 1982 Belgium announced its rejection of the Treaty.

Although there are no policy statements regarding the importance of ocean mining to Belgium, it wants to protect its interests in the field of ocean mining operations. According to a Foreign Ministry official, one major reason is to protect investments made by Union Miniere, a partner in the Ocean Mining Associates consortium, because this company has the potential to be a pioneer in the field and, as such, has a chance to obtain preferential exploration and exploitation rights for ocean mining.

Structure of Belgium involvement

Belgium has not encouraged the development of an ocean mining industry through any subsidy programs or direct financial assistance. A spokesman for the Economics Ministry stated that the free enterprise system, with minimal government involvement, is the best approach for developing a workable and self-sufficient commercial mining operation. The same official said that Belgium might step in and provide some type of assistance to ocean miners, like Union Minere, if it becomes apparent that private industry can no longer support the investment, but it is not clear how or when Belgium would intervene. Policy decisions for providing government assistance, incentives, subsidies, or other types of programs to private companies would be premature. At present there are no plans involving Belgian funds in the near term.

Traditionally, the Belgian Government has not supported private industry ventures and Union Miniere expects no government assistance in the form of grants or subsidies for ocean mining in the future. Only if the government desires or

requests a portion of mined minerals to be returned to Belgium, will Union Miniere look to the government for the appropriate mechanism, such as purchase contracts.

Realistically, according to an Economics Ministry official, a whole "new field of legislation" would need to be created specifically for Belgian ocean mining companies, if the government decides to offer any assistance.

Belgian Government attitude toward the Treaty

The Foreign Relations Ministry and Union Miniere officials we spoke with fully supported the U.S. opposition to the Treaty. Belgium has announced that it will not sign. The reason for the rejection of the Treaty is Belgian skepticism over the ocean mining provisions which officials believe advocate a "system of non-exploitation." An industry official candidly told us that in his view, the purpose of the Treaty is to prevent ocean mining, and that it will be difficult if not impossible to operate under such a Treaty.

According to figures quoted to us by an official in the Foreign Relations Ministry, the financial burdens imposed on Belgium (if it signs and ratifies the treaty) will be $2.5 million to $5.5 million for initial start-up expenses to establish the International Seabed Authority, and $800,000 to $1.1 million a year for operating expenses. Belgium's proportionate share was computed according to the United Nation's cost-sharing scheme and estimates of total costs. Since the financial burden is distributed among the signatory countries, without U.S. participation, assessments would increase.

A Foreign Relations Ministry official thought that an international treaty is absolutely necessary and that an acceptable agreement would preferably be a modified version of the current Treaty. However, possible interim substitutes to the Treaty would be a RSA between the most actively involved industrialized countries or a mini-treaty coupled with national ocean mining laws.

THE NETHERLANDS

The Government of the Netherlands does not have domestic legislation covering ocean mining. Government officials told us that there are two reasons for this. (1) such legislation might be viewed by some as a step against the Treaty, and (2) the Ministry of Economics doubted that any company would apply for a license under a Dutch law. (The Dutch companies plan to operate under the U.S. law.) Officials noted that there would be a need for legislation to implement any international agreement and to control private enterprise operating under such an agreement. Draft legislation for this purpose has been prepared which closely parallels the Treaty and it is likely that it will be presented to Parliament concurrently with the Treaty.

Government officials said that its draft is not restrictive or protectionist as, in their opinion, is the U.S. law. Dutch industry is represented in the Ocean Minerals Company consortium through Billiton--a subsidiary of Royal Dutch Shell--and Bos Kalis Westminster.

The government does not have a stated minerals policy. Although The Netherlands, like all the European countries, is highly dependent on imports for its mineral needs, there is no push to acquire government-controlled sources of supply. Government officials stated that their country is too small to be able to do much on its own.

## Structure of The Netherlands Government involvement

The Netherlands Government has not provided any funds for ocean mining research and development, nor does it plan to. There are no special programs in existence or contemplated which would stimulate the growth of the industry. Traditionally, the government has not subsidized industry. The steel industry was cited as an example of an industry which, while very important to the national economy, has received minimal government assistance.

The industry representatives said they cannot and do not plan on any kind of government support for ocean mining operations. One official said that, in his opinion, the disadvantages of government assistance outweigh the advantages. Another official wondered why a government would want to support a private investment decision based on an assumed profitable opportunity.

## The Netherlands Government and industry attitude toward the Treaty

During our visit the government had not yet decided whether to sign the Treaty, although the inclination was to do so since, according to a Foreign Ministry official, there was no real alternative. The Ministry had problems with some of the Treaty's provisions, but said that they could accept it (and that they have been told by industry that it would accept it also). The cited incentive toward signing was to be able to fully participate in the meetings of the Preparatory Commission. As it turned out, The Netherlands signed the Treaty on December 10, 1982.

Government officials were pessimistic about the success of any agreements outside the Treaty. They viewed it as unrealistic that one or a few countries would attempt to mine outside the Treaty. Further, they were not interested in being a party to any alternative that might create political problems with developing countries.

The Foreign Ministry official also stated that the United States would be jeopardizing the benefits of the other provisions of the Treaty if it failed to sign because of the ocean mining provisions. He said that it is an illusion for a country to suppose that it can pick and choose among the provisions it wishes to accept or reject.

Although industry had some problems with the ocean mining provisions--the issue of free access to the minerals for one--the officials we spoke with seemed to think that there was room for negotiation and change, both before and after any treaty is signed. They said that although they did not foresee ocean mining taking place without an international treaty because of political risk, they also did not see much happening under the provisions of the current version because of its restrictive nature.

They held out hope that further changes could be negotiated and that the United States would ultimately be a party to the Treaty. Without U.S. participation, one industry official speculated that there would be little mining work done --possibly only continued research and development by Japan, France, and the Soviet Union.

## CONCLUSIONS

The French and Japanese programs to heavily subsidize domestic industry allows them a broader range of options than other countries enjoy, according to some foreign officials who stated that, without government assistance, ocean mining under the Treaty would be impossible.

The result of these subsidy policies has had an adverse impact on U.S. efforts to achieve a broad western consensus for an alternative to the Treaty and, concurrently, attributed a sense of workability to the Treaty. In addition, a future ocean mining industry characterized by market conditions which may allow for only one or two nodule operations will place unsubsidized miners at a severe disadvantage and, more than likely, force them out of competition.

The UK and FRG are still undecided on whether they will sign. The primary reason they may sign is the apparent lack of an alternative to the Treaty, and the option not to ratify if desired changes are not achieved through the Preparatory Commission. Whether the absence of an immediate credible alternative will result in these countries signing the Treaty is unclear because, according to some of the foreign officials we spoke to in the UK, FRG, and The Netherlands, mining under the Treaty would be so onerous as to render operations unmanageable.

## CHAPTER 4

## STATUS OF AMERICAN OCEAN MINING AND VIEWS OF INDUSTRY OFFICIALS

Ocean mining by U.S. companies is through their membership in international consortia which, in recent years, have successfully carried out a variety of activities necessary to commercial development such as exploration and mining and processing tests. The testing has all been on a smaller scale than needed to determine operational economics. Due to the expense, larger tests may not be done until there is a more secure investment climate.

Based upon interviews with several representatives of U.S. ocean mining corporations and the public statements of their spokesmen, it appears that private industry is unsure of the future of commercial ocean mining and is reassessing its prospects. The basic element of this reassessment appears to revolve around the likelihood that an acceptable alternative to the Treaty will eventually evolve and allow free-enterprise ocean mining. Spokesmen are virtually unanimous in rejecting the Treaty because it is so burdensome that it makes free-market mining operations impossible.

### INDUSTRY CONCERNED ABOUT SECURITY OF INVESTMENT CLIMATE

Throughout the 1970s, U.S. companies participated in a broad variety of research and development activities necessary for evolving to a commercially viable industry. (See app. II.) They were involved with:

--Extensive exploration of potential mine sites.

--Mining tests to establish feasibility of the techniques and equipment to be used.

--Preparation for material processing tests, including construction of pilot plants.

In addition, the consortia to which the U.S. companies belonged were planning further efforts, such as larger scale processing tests and more mining tests. Obviously, getting closer to a complete mining and material processing system on a commercial scale requires increasing investment. There are doubts about whether larger scale efforts will be undertaken until commercial operations are clearly possible under an acceptable legal alternative.

Publicly, most U.S. private industry spokesmen say that they desire to eventually operate under the U.S.-flag, if at all possible, since the United States offers the most favorable environment for a new industry. However, a considerable strengthening of the political/legal environment must occur before any large-scale investment becomes practicable. One industry spokesman, reflecting the general disappointment of his consortium's membership over current investment prospects, categorized the U.S. ocean mining policy as a disgrace because no high-level effort to formulate a national policy was ever attempted. He said that the U.S. review of the Treaty (see p.7) concentrated on its precedent-setting provisions and never addressed the practicability of ocean mining and the steps necessary to promote the industry. Because of this lack of a U.S. Government policy or commitment to establish an industry, he went on to say, "the U.S. will be squeezed out of ocean mining by the Japanese and the French."

Another industry spokesman agreed that the Treaty does not provide the legal and political protection that will encourage the industry to take the risks necessary to develop ocean mining, and at the present time, the only route open is to proceed under U.S. domestic legislation. Although this spokesman is not asking for U.S. Government support programs, he stated:

> "The only possibility of foreign governments developing ocean mining under the treaty would be strong subsidies such as the Japanese subsidizing industry, or the French, or whoever it may be. That is the only reasonable approach that I can see. I cannot see it being done under venture capital anywhere in the world."

This spokesman went on to defend U.S. rejection of the Treaty, insisting that the repressive nature of the Treaty made it impossible to attract venture capital, thus making the eventual development of a U.S. industry very unlikely.

Industry representatives generally agree that the addition of a significant degree of certainty is necessary before further major investment can proceed. One spokesman told us of the necessity of moving very quickly on an alternative treaty otherwise, U.S. ocean mining will never fully develop. He stated that because of the likelihood of slow growth in future mineral demand, the first one or two ocean miners to undertake commercial operations will probably squeeze out all competitors for perhaps 20 years. Although these miners will take some losses at first, eventually their investment will pay off. Late entries, however, will find the market too saturated to operate effectively and find it difficult to survive.

Another spokesman placed great emphasis upon the need to begin investment at an early date if mining is to be realized by the 1990s. He stated that the $120 million previously invested by his consortium in ocean mining would have to be followed by a 5-year $250 to $300 million program to perfect their technology. At that point, another 5 years and $1 to $1.5 billion would be required to scale-up to commercial operations. Once this stage is reached it would take another 5 to 10 years, depending upon mineral markets, to recoup their investment. Not all industry representatives, however, display the same sense of urgency.

Private industry spokesmen are divided on the question of U.S. Government assistance to ocean mining. Some, in their public statements, reject Government involvement in ocean mining outside the negotiation of a stable legal/political treaty conducive to commercial investment. Others argue, that at a minimum, Government-sponsored political risk insurance should be made available. Industry spokesmen we have contacted insist that they have not researched the full range of Government programs which may be applicable to ocean mining.

## OTHER INVESTMENT OPTIONS

It is possible that a U.S.-flag ocean mining industry geared toward the commercial recovery of manganese nodules may never develop or may do so on a more modest scale, e.g., within the U.S. EEZ rather than through international consortia beyond national jurisdictions. The principal factor behind such a scenario would be the development of a more lucrative alternative source of seabed minerals. Polymetallic sulfides (see p.2) provide an example of a potentially valuable and less capital-intensive resource which the seabeds hold.

Although the base of knowledge of these sulfides is very limited at this time, much of the at-sea technology developed for nodule recovery could be transferred to sulfide recovery. The adaptability of existing metallurgical processing technology to the sulfides could result in a substantially lower capital cost for sulfide recovery.

Nodules, on the other hand, require a specially designed processing system to separate out their constituent metals. The development of this processing system is generally considered to represent 50 percent of the total capital cost of ocean mining technology. Eliminating the need to develop such specialized processing technology may translate into a savings of up to $750 million per project. Although the knowledge base necessary for the development of sulfide deposits is still quite inadequate, there will likely be a cascade of such information during the minimum 10 to 15 year lead time before ocean mining is likely to

begin. The eventual development of polymetallic sulfides may result in venture capital "leapfrogging" nodules to reach the next generation of seabed minerals. This tendency to leap ahead toward more valuable mineral supplies has substantial precedent and is illustrated by the commercial interest in nodules vis-a-vis the development of new land-based mineral deposits. Other potential mineral deposits of recent interest are manganese crusts of sea mounts (large volcanic mountains rising from the seabeds) containing cobalt. These deposits are attracting increasing attention and undoubtedly will be the subject of further scientific investigation.

## CONCLUSIONS

The consensus of U.S. ocean mining interest representatives we spoke to is that they intend to operate under the U.S. flag and do not seek any assistance or other support programs from the U.S. Government. They stated that participation in the Treaty would create an impossible investment climate and that they are at a competitive disadvantage based on plans by certain foreign governments to underwrite national ocean mining efforts. In this context, some of them support government help for this fledgling industry; others only look to the Government to establish a stable environment that the private investment community can rely on.

## CHAPTER 5

## SUPPORT NEEDED FOR THE DEVELOPMENT OF U.S. OCEAN MINING POLICY

Concern over the uncertain availability of some minerals considered essential or critical to: (1) the Nation's industrial base during peacetime, (2) demand surges including military buildups, and (3) national emergency mobilization, has long been an issue associated with the need for a national nonfuel minerals policy. In April 1982, the President, in a report to the Congress, stated that the administration is seeking to reduce our dependence on politically unstable foreign sources of minerals by eliminating barriers to developing deep seabed mineral resources. However, ocean mining is an undeveloped and untested alternative to reducing U.S. vulnerability to supply disruptions and sharp price increases in strategic and critical nonfuel mineral markets.

We believe that a U.S. policy on ocean mining needs to be clarified. The policy should determine the future role of ocean mining in supplying U.S. mineral needs and should set out what, if anything, the Federal Government is prepared to do to aid this evolving industry. But first, assessments are needed of whether ocean mining is in the U.S. interest to pursue, considering such matters as vulnerability and alternative sources. This type of assessment is required but has not yet been done.

If the assessments point to the desirability of some form and level of Federal Government involvement with, and perhaps assistance to, ocean mining development there are a number of existing programs which could provide guidance for such activity. Use of these programs, however, would require the coordination of the efforts of the 15 Federal agencies which administer them.

### U.S. OCEAN MINING POLICY SHOULD BE DEVELOPED

The National Materials and Minerals Policy, Research and Development Act of 1980 (P.L. 96-479, Oct. 21, 1980, 94 Stat. 2305, 30 U.S.C. §1601 (et.seq.)) gives high priority to the issue of strategic and critical minerals. Its legislative history shows that the Congress was concerned that minerals issues, because of their importance and the widespread nature of the Federal programs affecting them, are deserving, and in fact, require an Executive Office focus to provide continuity. The Cabinet Council on Natural Resources and Environment established by Presidential statement in February 1982, was designated to coordinate a national materials policy.

However, the newness of the industry, the many economic and political uncertainties which surround it, and the lack of an

overall U.S. policy toward ocean mining, has caused Federal agencies to shy away from seriously considering manganese nodules as an alternative mineral source. For example, the Federal Emergency Management Agency (coordinating and planning body for the National Defense Stockpile) sets a 5-year planning horizon and has not included ocean mining as a potential source of strategic materials for the stockpile because the likely time frame for ocean mining is over a decade away, thus exceeding its 5-year planning schedule. Officials of the Department of the Interior's Bureau of Mines have stated that, because of the uncertainties surrounding ocean mining compared with traditional land-based mineral development they favor expanding land-based capacity for U.S. mineral supplies. The General Services Administration, the purchasing agent for the strategic stockpile, indicated that, as with the Federal Emergency Management Agency, ocean mining's distant development and associated uncertainties place it beyond General Services' 5-year planning horizon.

A Department of Defense official informed us that Defense will not get involved with ocean mining until it proves to be a viable mineral source and nears commercialization. He described ocean mining as a peacetime alternative to unreliable sources of supply. He also stated that Defense could eventually purchase the output of such mining on the grounds of national security and/or interest.

The 1980 Act designated NOAA responsible for issuing exploration licenses and recovery permits to U.S. citizens. NOAA is also responsible for publishing regulations for implementing deep seabed mining while assuring protection of the marine environment. In January 1982, NOAA began accepting applications for minesite claims and received 10, as of the March 12, 1982 cut-off, from four U.S. corporations which are members of international deep seabed mining consortia. Each application was in conflict with at least one other in terms of overlapping boundaries of sites claimed. Individually, applications were in full compliance with NOAA regulations. The consortia elected to resolve the conflicts on their own and entered into an arbitration agreement in July 1982, which included the all-French Consortium. Formal arbitration commenced in April 1983 and basic agreement was reached in early June regarding site claims. A period of time will elapse before closing arbitration to permit a business review by the Justice Department. Also it is hoped that the Japanese will decide to join. In addition, NOAA has been actively engaged in the negotiation of a RSA, as discussed in Chapter 2. Overall, NOAA's role is largely limited to administrative/custodial duties and lacks planning, coordinating, or lead agency powers.

The Maritime Administration, Treasury Department, Internal Revenue Service, and Overseas Private Investment Corporation have all indicated that, although they administer programs which may affect ocean mining investment ranging from ship subsidies to tax relief and insurance, they require policy guidance from higher governmental authority before initiating action or

proposing initiatives in this area. Officials of the Office of Management and Budget, whose planning horizon is even shorter than the 5-year cycle of the Federal Emergency Management Agency or the General Services Administration, stated that they have not examined the applicability of certain subsidy programs to ocean mining similar to what they are doing in reviewing government support of a new national maritime policy. Officials of the Office of the U.S. Trade Representative stated that they have not looked into the issue because of the current administration's reluctance to subsidize private industry. National Security Council officials told us that the question of whether the United States will apply existing assistance programs or guarantees to ocean mining was not addressed in terms of the Council's policy review responsibilities concerning the Law of the Sea. They believe such a decision is still some years away.

However, U.S. companies have already been involved in developing ocean mining technology for 10 years and longer. They should not have to wait indefinitely to find out how their government will react to the evolving industry.

## U.S. OCEAN MINING POLICY COULD BENEFIT FROM MARKET VULNERABILITY ASSESSMENTS

To help develop policy, assessments need to be made of such matters as U.S. vulnerability in certain minerals markets, the best way to reduce or eliminate such vulnerability, and determining which minerals, if any, require Federal intervention.

P.L. 96-479 requires the Office of Science and Technology Policy (OSTP) to make short- and long-term assessments of national materials needs in accordance with provisions of the National Science and Technology Policy, Organization, and Priorities Act of 1976, P.L. 94-282, (42 U.S.C. §6601 et. seq.). Among other responsibilities assigned by the Congress in the enactment of P.L. 94-282, OSTP is required to:

> initiate studies and analysis, including systems analysis and technology assessment of alternatives available for the resolution of critical and emerging national and international problems amenable to the contributions of science and technology and, insofar as possible, determine and compare probable costs, benefits, and impacts of such alternatives....

OSTP policy analysts responsible for minerals issues advised us that OSTP activities concerning minerals are essentially the same as we had reported in 1981:

--reviewing, along with the Office of Management and Budget, individual agency budgets in minerals and materials research and development, and

--participating in policy discussions on minerals and materials issues as part of the Cabinet Council on Natural Resources and Environment working group on strategic minerals.

The policy analysts advised us that OSTP involvement in terms of legislative mandates takes place through the Committee on Materials of the Federal Coordinating Council for Science, Engineering, and Technology. The OSTP Director is the chairman of the Council which is advisory in nature regarding problems and developments in the fields of science, engineering, technology, and related activities affecting more than one Federal agency.

Detailed assessments of minerals demands, supply, and needs; U.S. vulnerability in existing mineral markets; or benefits and costs of alternative sources to reduce vulnerability have not been made by OSTP. Also, the Cabinet Council working group has not met since the time of the President's April 1982 report discussed immediately below.

## EXISTING U.S. LEGISLATION MAY PROVIDE SOME GUIDANCE IN DEVELOPING OCEAN MINING POLICY

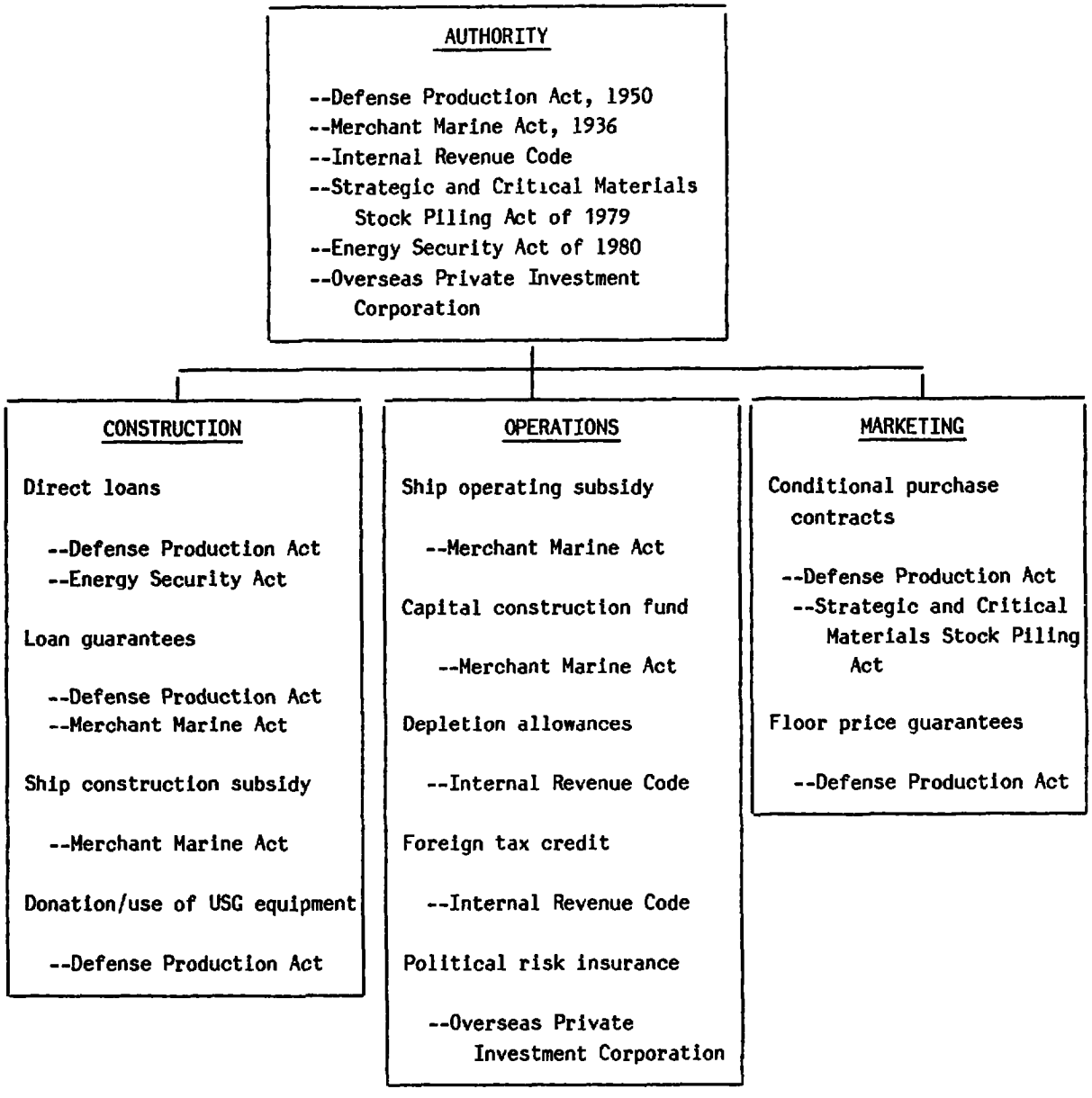
The President's April 5, 1982, program plan and report to the Congress required by Public Law 96-479 states that the administration is seeking to reduce our dependence on potentially unstable foreign sources of minerals by eliminating barriers to developing seabed mineral resources.

There are a number of laws in addition to the 1980 Act which may serve as guides to future incentive programs applicable to ocean mining if the assessments show that such efforts should be part of the U.S. policy. Some were enacted to aid land-based mining by mitigating the major economic risks involved in the development of new domestic mineral supplies. They include the Defense Production Act of 1950; the Energy Security Act of 1980; the Strategic and Critical Materials Stock Piling Act of 1979; the National Materials and Minerals Policy, Research,and Development Act of 1980; and the Merchant Marine Act of 1936. In addition, other laws and regulations may also apply such as those associated with Federal taxation.

The applicability and potential impact of these and, perhaps, other laws and regulations need to be examined as part

of the comprehensive assessment from which the U.S. Government's policy on ocean mining would evolve. A number of the programs available under these laws are listed in the following chart which displays them in three general areas of aid. Some of those listed are then briefly described. By describing them, we are intending to merely point out what seems to be available among existing programs and other forms of assistance. Using any or all of these programs would require coordinating the efforts of the many Federal agencies which administer them. This is especially important because the 15 Federal agencies we visited during our review follow their own approaches toward ocean mining. An extensive diffusion of responsibility is apparent as each agency has some jurisdiction over a relatively minor respect of ocean mining while all 15 fell short of demonstrating sufficient interests or authority to assert a leadership role in assessing the need for and viability of ocean mining.

## EXISTING FEDERAL INCENTIVE LEGISLATION



Purchase contracts

The Defense Production Act of 1950 authorizes the negotiation of long-term, contingency based, purchase contracts which, if applicable to ocean mining, could guarantee ocean miners a market for a portion of their output at a predetermined volume, price, and form.[1] However, their use would have to be justified based on economic and national security benefits and costs.

Purchase contracts are predicated upon the assumption that private industry would seek to sell its output on the open market but that some purchase guarantees would be provided by the Government. For this reason, the contracts include a trigger mechanism which would obligate the Federal Government to purchase a fixed amount of a miner's output at a negotiated price for the National Defense Stockpile if certain conditions are met. The contracts also provide that these Government purchases could be discontinued if market conditions improved. In effect, they obligate the Federal Government to operate as the purchaser of last resort.

The use of such purchase contracts could provide incentives for a new industry and help fulfill the goals of the U.S. national strategic stockpile (albeit in a very costly manner). Inventory of the U.S. strategic stockpile revealed large shortfalls as of January 1, 1983, in three of the four principal products of ocean mining--copper, nickel, and cobalt--as shown below.

| | Quantities | | Shortage |
|---|---|---|---|
| Mineral (units) | Inventory | Stockpile Goal | (Percent) |
| Copper (short tons) | 29,048 | 1,000,000 | 97 |
| Nickel (short tons) | 32,210 | 200,000 | 84 |
| Cobalt (pounds) | 45,731,669 | 85,400,000 | 46 |

Loan guarantees

The availability of Government-sponsored loan guarantees for ailing or speculative industries in which the United States has a strong national interest can encourage investors to risk private capital in such ventures. The present study, as well as our previous report[2] on the development of a future U.S. ocean

[1]The 97th Congress extended the life of the Defense Production Act until September 30, 1983 (P.L.98-12, March 29, 1983, 97 Stat. 53.).

[2]"Impediments to U.S. Involvement in Deep Ocean Mining Can Be Overcome" EMD-82-31, February 3, 1982.

mining industry, found that because of the uncertain economic and political climate surrounding this new mining frontier, commercial banking institutions are reluctant to commit the vast sums of money necessary for large-scale mining operations to begin.

Under section 301 of the Defense Production Act, the Federal Government can guarantee a loan in connection with the performance of national defense contracts. There has been a $20 million limit on the size of individual loans, and the loan-to-value ratio can range from 50 to 100 percent. There is no limit on the number or aggregate value of guaranteed loans. This program has been used before to stimulate the development of domestic mineral and energy supplies.

Also, under Title XI of the Merchant Marine Act of 1936, loan guarantees can be used to finance new vessels constructed and documented in the United States. The guarantee is limited to 87.5 percent of the actual cost of construction (75 percent for certain vessels) with no upper limit on the size of each loan. The total amount guaranteed cannot exceed $7 billion. The average size of guarantees under this program has been $20 million, with a range of $106,000 to $357 million.

The purpose of this program is to provide qualified shipowners with a debt financing instrument having a more attractive interest rate and a more favorable amortization schedule than would otherwise be available. Title XI loan authority is currently being used under the Ocean Thermal Energy Conversion program[3] which is considered to be very speculative, highly capital-intensive, and future resource-oriented, making it quite similar to ocean mining.

Ship operating differential subsidy

The Maritime Administration, under the Merchant Marine Act of 1936, can pay an operating subsidy to U.S. shipping companies to offset the higher cost of operating vessels in foreign trade under the American flag rather than foreign flags. An operating subsidy is available to qualified U.S.-flag shipping companies for the operation of ships in essential services in the foreign commerce of the United States. This form of aid, depending on vessel type, can help cover wages, insurance, maintenance and repairs not compensated by insurance.

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[3]The Ocean Thermal Energy Conversion program is one of several energy research and development projects being conducted by the Department of Energy with the eventual aim of reducing U.S. dependence upon imported oil.

In fiscal year 1981, operating subsidies amounted to approximately $335 million; however, there is a current moratorium on them. According to Maritime Administration officials, the operating subsidy could be applied to the support vessels used in an ocean mining industry.

Construction differential subsidy

The Maritime Administration can pay a construction subsidy to American shipbuilders, representing the difference of having a ship constructed in a low cost foreign shipyard versus a high cost U.S. shipyard. In fiscal year 1981, construction subsidies amounted to approximately $196 million. However, there were no appropriations made for such subsidies in the fiscal year 1982 or 1983 budget. All types of U.S.-flag ships operating in foreign trade, such as tankers, liquified natural gas carriers, and ocean mining vessels (as defined under the 1980 Act) are eligible for a construction subsidy, according to Maritime Administration officials.

Capital Construction Fund

The Capital Construction Fund program was created to assist owners and operators of U.S.-flag vessels in accumulating the capital necessary for the modernization and expansion of the U.S. Merchant Fleet. The program encourages construction, reconstruction, or acquisition of vessels through the deferral of Federal income taxes on deposits into the fund.

U.S.-flag operators are at a competitive disadvantage in the construction and replacement of their vessels relative to foreign flag operators with vessels registered in countries that do not tax shipping income. The Capital Construction Fund program helps counterbalance this situation through its tax-deferral privileges.

According to Maritime Administration officials, the Capital Construction Fund could be used by ocean miners after sufficient deposits were made to the fund.

Tax relief for ocean miners

The manner in which Federal income tax requirements are applied to future ocean mining may have a significant effect upon its attractiveness to potential investors. Two areas of the Internal Revenue Service (IRS) Code would most likely surface in deciding over the role of the U.S. Government in encouraging ocean mining: the application of percentage depletion allowances and foreign tax credits. IRS officials declined to offer a firm opinion on how ocean mining would be treated. They indicated that such a determination would have to await a

specific case and a resulting policy determination from the Department of the Treasury.

The IRS Code permits mineral producers to write off the declining value of a minesite owing to the extraction of valuable mineral resources during the course of normal operations. This is known as the percentage depletion allowance and provides a deduction equal to specified percentages of the gross income from the sale of the various minerals extracted, subject to certain limitations. Percentage depletion compensates the owner for the reduction in the value of property resulting from the removal or sale of the minerals. The depletion allowance is available to a taxpayer who has an economic interest in the minerals, defined as

> any interest in place or standing timber and secures, by any form of legal relationship income, derived from the extraction of the mineral or severance of the timber, to which he must look for the return of this capital . . . .[4]

Two questions need to be addressed: first, are manganese nodules covered under the section of the IRS Code authorizing depletion allowances, and secondly, would the miner have the required "economic interest"?

Section 613 of the IRS Code names the minerals covered by the depletion allowance. Manganese nodules are not named but their constituent minerals of manganese, copper, nickel, and cobalt are. The rates differ depending on the type of mineral and location of deposit: 22 percent for nickel, cobalt, and manganese and 15-percent for copper from deposits located within the United States; 14-percent for mineral mines located outside of the United States.

The economic interest question considers who is eligible to claim the deduction. In most cases, it is understood that the mineral in question qualifies, and the issue is whether or not a claim to a deduction by a particular party is valid. Economic interest is usually documented in the form of a lease, title, or outright ownership of the mineral deposit. In the case of nodules, establishing economic interest is complicated by the lack of such documentation.

Under the IRS Code, foreign taxes paid by a U.S. taxpayer can be credited in computing U.S. tax liability. For ocean miners some interesting questions will eventually arise to which answers have yet to be determined, according to IRS officials.

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[4]Standard Federal Tax Report, Regulation 1.611.1 (b)(1).

One is whether U.S. ocean miners operating under the Treaty would be able to claim the foreign tax credit for assessments paid to the International Seabed Authority: are the assessments taxes[5] or are they normal business expenses? Integral to such a decision is the willingness of a nation to concede the power to levy taxes to an international organization, a power usually reserved by sovereign states.

Political risk insurance

Political risk insurance for ocean miners would provide protection against political risks not normally encountered in the operation of a business.

During the debate over H.R. 3350, the bill which became the 1980 Act, the issue of risk insurance was considered and then rejected primarily because the envisioned risk involved the loss of minesite tenure owing to transition by the United States to a treaty. Opponents argued that it would be improper for the U.S. Government to insure private industry against losses resulting from a sovereign act of government such as the acceptance of an international treaty, even if the treaty did not recognize minesite claims granted under national legislation.

The question of risk insurance has again surfaced, but its nature has changed considerably due to the U.S. rejection of the Treaty and inability to negotiate a RSA. National legislation is currently the only apparent means to establish deep seabed minesites for U.S. citizens. If this alternative is used, insurance would have to be discussed in terms of the extraordinary political risk from factors outside U.S. control.

The Overseas Private Investment Corporation would be a likely candidate to administer such a program. Corporation officials have told us that a change in its authorizing legislation and increased resources would be required.

CONCLUSIONS AND RECOMMENDATION

The United States should develop a policy toward ocean mining based on assessments concerning U.S. vulnerability to interruptions in the supply of imported strategic and critical

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[5]During 1978 and 1979, an Ad Hoc study group of OECD's Committee of Fiscal Affairs met to consider this question. The basic conclusion reached by this group was that payments to the International Seabed Authority are to be regarded as normal business expenses, not taxes. Officials in several countries that we visited, however, expressed concern over the eventual treatment of such payments, as did U.S. private industry representatives.

materials. Many Federal agencies have jurisdiction over some aspect of ocean mining. Because each agency has relatively limited involvement, a coherent strategy on how best to integrate the full range of programs and policies to assist in developing an alternative source of valuable mineral resources has not emerged. If the government decides that the deep seabeds are an alternative source of essential materials that should be developed, an ocean mining policy including what the Federal role should be, will have to be articulated within the context of a national nonfuel minerals and materials policy. U.S. companies with ocean mining potential or interest will then be better prepared to make decisions concerning labor and capital investment. It is important that potential investors understand the government's position on such a new venture. Will support mechanisms be available? What forms will they take? Where, in the business cycle, are they likely to occur? What environmental, political, economic or other issues must be confronted? Who will be responsible for the sophisticated analytical and predictive work on an ocean mining industry level? These are some of the questions an ocean mining policy should address, but it should be part of, and not separate from an overall national nonfuels minerals and materials policy.

Responsibility for coordinating the development of such a policy has been assigned to the Cabinet Council on Natural Resources and Environment. We are currently assessing the appropriateness of assigning this responsibility to the Council, by examining whether it has the representative membership, authority and permanency necessary to provide active, continuous leadership and direction.

Certain assessments will have to be made in order to support the development of an ocean mining policy. These include (1) measuring needs of and the degree of U.S. vulnerability in a given commodity; (2) weighing the benefits and costs of various approaches to reducing or eliminating the vulnerability, and (3) performing comparative analyses to help decide which strategic and critical minerals will require federal intervention. These approaches should include supply related ones such as increased stockpiling and domestic production, including ocean mining, as well as demand related actions such as substitution, recycling, and conservation. We recognize that such assessments will require the resources, time, efforts, and expertise of several Federal agencies. However, the results should provide government policymakers with a better basis to decide what, if any, assistance should be provided to promote ocean mining.

We recommend that the Director, OSTP, do the necessary assessments to support the development of an ocean mining policy since, by law, OSTP is responsible for short-and long-term assessments of national materials needs.

## CHAPTER 6

## AGENCY COMMENTS AND OUR EVALUATION

We requested comments from the Department of State, National Security Council, OSTP, and the Department of the Interior. Comments were received from the Department of the Interior and the National Security Council. The Department of State advised us that they reviewed the report but did not have any comments to make. The National Security Council did not provide comments.

Interior's primary comment was that the report places too much emphasis upon Presidential actions and the Treaty while downplaying the precarious state of the overall investment climate for minerals resulting in little or no economic incentive to pursue mining of the deep seabeds at this time. However, it was not within our scope of review to evaluate the impact of the general economic situation on the minerals industry or on the ocean mining investment climate. Rather, the focus of our report is on the status of ocean mining policy, and assessments of strategic and critical mineral needs and sources of supply that should be developed to satisfy needs. This assessment should be undertaken prior to going forward with an operational program to gain direct access to the deep seabeds. We note that the Department of the Interior did not disagree with the recommendation that these assessments be undertaken.

Interior also noted what they termed as "substantive errors" in our discussion of the constituents of polymetallic sulfides. The data Interior cited, however, was from a 1966 study while the data we used was from a 1982 NOAA report on the sulfides and contained representative assays of samples recently recovered.

On another point, Interior suggested that since the monetary investments of foreign governments are cited, we should cite the monetary size of the total U.S. ocean mining effort as well. This is not possible since the total investment dollars in ocean mining by U.S. companies are purely private capital and unknown, as are the private investment portions of the French and Japanese programs. Also, unlike France and Japan, the U.S. Government does not currently provide financial assistance to U.S. companies to engage in ocean mining or to develop ocean mining technologies.

OSTP asserted that public policy statements by the administration, a leading example being the President's announcement of

six objectives necessary for U.S. accession to the Treaty, represented clear national policy. We believe the statements are clear on matters they were intended to address, namely, the administration's position on the Law of the Sea Treaty. However, U.S. policy has not been developed to the point of formulating a position on what role, if any, the Federal Government should have in promoting ocean mining.

OSTP stated that it is aware of the importance of having dependable sources of critical and strategic materials; however, we found that the assessments mandated by P.L. 96-479 have not been done by OSTP.

## RELATED GAO REPORTS

Federal Encouragement of Mining Investment in Developing Countries For Strategic and Critical Minerals Have Been Only Marginally Effective (ID-82-38; Sept. 3, 1982)

Actions Needed to Promote a Stable Supply of Strategic and Critical Minerals and Materials (EMD-82-69; June 3, 1982)

Impediments to U.S. Involvement in Deep Ocean Mining Can Be Overcome (EMD-82-31; Feb. 3, 1982)

The Law of the Sea Conference--Status of the Issues, 1978 (ID-79-6; Mar. 9, 1979)

Deep Ocean Mining: Actions Needed to Make it Happen (PSAD-77-12, Mar. 9, 1979)

Results of the Third Law of the Sea Conference 1974 to 1976 (ID-77-37; June 3, 1977)

Deep Ocean Mining Environmental Study--Information and Issues (PSAD-76-135; Sept. 21, 1976)

Information on United States Ocean Interests Together With Positions and Results of the Law of the Sea Conference at Caracas (ID-75-46; Mar. 6, 1975)

APPENDIX II

## EIGHT MAJOR DEEP SEA MINING CONSORTIA

**Activities and plans**

1 **Kennecott Exploration Corp** (Kennecott Group)
**Formed** January 1974 **Equity capital** $50 million
**Composition** Kennecott Copper U S Rio Tinto Zinc UK Consolidated Goldfields UK British Petroleum UK Noranda Mines Canada Mitsubishi Japan
**Subsidiaries** TRZ Deepsea Enterprises and BP Minerals Ltd
**Exploration activities** Extensive work in the Clarion Clipperton Zone no longer actively exploring
**Test mining activities** Collector tests at ⅛ scale in 1975 Pipe system tested at sea
**Test processing activities** Finished constructing pilot processing plant in 1976 with 1 tpd capacity
**Plans** To test ⅓ scale mining system including collector and ore lifting method

2. **Ocean Mining Associates (OMA)** Also known as U S Steel Group or Deepsea Ventures Group
**Formed** 1974 **Equity capital** $50 million
**Composition** U S Steel U S Union Miniere-Belgium Sun Co U S
**Subsidiaries** Essex Minerals Union Seas Inc Sun Ocean Ventures
**Background** Consortium evolved out of Deepsea Ventures which began as a wholly-owned subsidiary of Tenneco and was joined by Japanese Manganese Nodule Development Co a Japanese group consisting of C Itoh Nichimen and Kanematsu Gosho Later U S Steel and Union Minière joined the venture and Tenneco and JAMCO withdrew With Sun as a recent partner OMA was formed
**Activities** Extensive exploration in Clarion Clipperton Zone with exploration ship *Prospector* 1974—claims announced for a 60 000 km² minesite in the Zone between Latitudes 14°16 N and 15°44' N and Longitudes 124°20 and 127°46 W Mineral assessment completed during 120 day grab sampling program by Tracor Marine during 1981
**Test mining** 1970 DVI demonstrated airlift system offshore Florida at 800 m depth late 1978-completed prototype testing with *Deepsea Miner II* recovering 500 tons of material
**Test processing** Completed pilot processing plant
**Plans** Will use converted ore carrier *Weser Ore* as test mining ship in Phase III

3 **Ocean Management Inc** (OMI OMINC) Also known as INCO Group
**Formed** February 1975 in N Y **Equity capital** $45 million
**Composition** International Nickel (INCO) Canada Sedco U S Metallgesellschaft W Germany Preussag W Germany Salzgitter W Germany and 23 Japanese companies
**Consortium** Arbeitsgemeinschaft Meerestechnischgewinnbare Rohstoffe (AMR) Deep Ocean Mining Co (DOMCO) Ltd
The Japanese companies include nine from the Sumitomo Group Bank of Tokyo Dowa Mining Idemitsu Industrial Bank of Japan Komatsu Kyokuyo Marubeni Mitsui OSK Lines Nippon Mining Nissho Iwai Shinko Electric Tokyo Rope-Manufacturing and Toyo Menka
**Activities** Extensive exploration in Clarion Clipperton Zone by ships *Valdivia* and *Sonne*
**Test mining** Mid 1978—three successful test runs by *Sedco 445* converted to test mining ship sea trials established technical feasibility of lifting capability pumping system and air lift method

4 **Ocean Minerals Co** (OMC OMCO) Also known as Lockheed Group **Formed** November 1977 Mt View Ca **Equity capital** $50 million
**Composition** Lockheed Missiles and Space U S Billiton BV Netherlands Bos Kalis Westminster Ocean Minerals BV Netherlands Standard Oil of Indiana U S
**Consortium** Ocean Minerals Inc
**Subsidiary** Amoco Ocean Minerals Co
**Activities** Exploration in Clarion Clipperton Zone by ship *Governor Ray* mid 1978—recovered 450 samples totaling several thousand pounds of nodules by free fall grab samplers planned program of six cruises began
**Test mining** Successfully completed ¼ scale collector test in mud pit Late 1978—*Glomar Explorer* completed shallow water test at depth of 1 800 m November 1978 deepsea testing at 5 000 m canceled because of rough seas and mechanical problems with doors at bottom of *Glomar Explorer* Testing early in 1979 was successful
**Test processing activities** Operation of test plant in Hawaii to begin in mid 1979 at 50 mtpd for 3 5 years has been postponed
**Plans** Successfully tested mine at depth of 5 000 m

5 **Association Francaise Pour l Etude et la Recherche des Nodules** (AFERNOD) Also known as French Group Headquartered in Paris
**Composition** Several French government agencies including Centre National pour l Exploitation des Océans (CNEXO) Comissanat a l Energie Atomique (CEA) and Bureau des Recherches Geologiques et Minieres (BRGM) and a few private companies including Societé Le Nickel (SLN) and Chantiers de France-Dunkerque a member of the Empain Schneider Group
**Activities** Performed systematic exploration of Clarion Clipperton area using optimized grid patterns
**Plans** Focus on detailed exploration and equipment development Will form working group according to regulations

6 **Continuous Line Bucket (CLB) Syndicate** Also known as CLB Group
**Composition** About 20 companies including U S Steel U S AMR W Germany CNEXO and SLN France INCO and Noranda Mines-Canada DOMCO Sumitomo Heavy Industries and Furukawa Japan Broken Hill Proprietary (BHP) Australia
**Test mining** Tested one ship system in 1970 72

7 **Deep Ocean Minerals Association** (DOMA) Also known as Japanese Group headquartered in Tokyo
**Composition** An association between Japanese industry and government Includes 35 Japanese companies—three from Mitsubishi Group four from Mitsui Group six from Nippon Group four from Sumitomo Group and C Itoh Dowa Mining Furukawa Kanematsu Gosho Kyokuyo Marubeni Nichimen Nissho Iwai and Toyo Menka
**Activities** Exploration carried out by Metal Mining Agency a semi-commercial entity linked to MITI of the Japanese government co-operative arrangement with Geological Survey to use vessel *Hakurei Maru* survey on southern Hawaiian seas
**Plans** Extensive exploration using ship launched in 1980

8 **Eurocean**
**Formed** 1970
**Composition** Made up of 24 European companies—two from France three from Belgium four from the Netherlands one from the UK three from Italy eight from Sweden one from Norway one from Spain and one from Switzerland
**Activities** Is non-commercial Work directed to scientific research and survey

Source Cruickshank, Michael J The status of deep sea mining Ocean industry magazine, v. 16, October 1981 93

APPENDIX III

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON D C 20500

February 28, 1983

Dear Mr. Myers

As requested in your January 5, 1983 letter, we have reviewed your proposed report to the Congress entitled, "Lack of Policy and Management Focus Places U S Ocean Mining in Doubt."

With regard to your recommendation that detailed assessment of U S ocean mining policy be undertaken, particularly within the context of a national nonfuels minerals and materials policy, we believe these issues are, in fact, being fully addressed both through public policy statements as well as actions by OSTP and other representatives of the Executive Office In the first place, we consider that the Presidential statement of January 29, 1982 (pages 8 and 9) represents clear national policy on this matter We are well aware of the importance of having dependable sources of critical and strategic minerals and of the vulnerability of some of our current sources. As P L 96-479 requests, OSTP, through the FCCSET Committee on Materials, gives high priority to the critical and strategic materials issue as well as the research and technology that can help to solve some of the problems.

We appreciate the opportunity to comment on the report and would be happy to address any further concerns you might have in the future on this subject

Sincerely,

John M Marcum
Assistant Director
Energy and Natural Resources

Mr Morton A Myers
Director
Program Analysis Division
U.S General Accounting Office
Washington, D C 20548

# United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D C 20240

MAR 7 1983

Mr. J. Dexter Peach, Director
Resources, Community, and Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach

The Department of the Interior has reviewed the draft report entitled "Lack of Policy and Management Focus Places U.S. Ocean Mining in Doubt" and has the following general comments on the draft

First, the title itself reflects the overly negative tone of the whole report, and is misleading. It is a mistake to assign the parlous state of marine mining today solely to the Administration's attitude toward the United Nations Convention on the Law of the Sea and the "lack of policy and management focus" regarding ocean mining or other oceans issues. The current economic situation has placed the whole of the minerals industry in difficult straits -- even proven reserves with proven, in-place technologies, are being closed down -- so that there is little or no economic incentive to pursuit of mining of manganese nodules of the deep seabed by United States industry, at this time.

Second, while various marine minerals (manganese nodules, marine sulfides, manganese crusts, etc.) may well provide alternative sources of strategic and critical materials, it is a mistake to consider factors such as the encouragement and incentives to marine mining in isolation, without giving consideration to the possibly competing application of these assets to other resources of land deposits of the United States not now being exploited.

Third, the report contains substantive errors, such as the references (e.g., page 5) to the metals contained in the sulfide deposits as well as in nodules, etc., which are misleading -- some of the metals are present as major constituents in some samples (zinc), as traces (gold), and as probably useless contaminants (iron). Little is known of the range of assays, of mining and processing technologies, and even of the extent and location of the deposits to warrant the excessive optimism displayed regarding their economic viability as alternative sources of strategic and critical materials. For example, on page 41, the indication given that the sulfides are a "less capital intensive resource" than the manganese nodules is not supported by the current intensive knowledge -- the statement may be true, but equally may not be true. Both recovery -- "mining" -- and processing technology capital requirements depend upon the nature and extent of the ore body, and on the values to be recovered in the processing as products, co-products, and by-products, or to be rejected in the tailings.

APPENDIX IV

Fourth, we note the concern expressed regarding the recommendation by your office on responsibility for formulating and coordinating a U.S. ocean mining policy within the context of an overall national nonfuels minerals policy.

Because of the relationship of that recommendation to your "ongoing study pertaining to the Cabinet Council" (on Natural Resources and the Environment), we would, of course, be pleased to contribute to that study, or to review it in draft.

Fifth, we call your attention to the work completed by the Cabinet Council of the possible United States Exclusive Economic Zone, and related oceans policy issues, and the ongoing effort within the National Security Council to review national security implications of that proposal and to assist in the formulation of general guidance on oceans policy at the Presidential level.

Finally, we note that the United States policy toward ocean mining must be an amalgam of the general United States policy on oceans matters and of the general United States policy on minerals. Further, there may well need be a separation in consideration of ocean mining, beyond the limits of national jurisdiction -- be that of the continental shelf or of exclusive economic zones -- and of the deep seabed beyond such limits. The known seabed minerals -- nodules, crusts, and sulfides -- probably occur both within these limits and outside.

While we have not submitted line-by-line comments, we attach some more specific concerns. Some of these provide more details to points above, others provide added issues. We would be pleased to work with your staff on specific changes to the draft. We look forward to such a cooperative effort.

Sincerely,

Dan Miller

Daniel N. Miller, Jr.
Assistant Secretary for
Energy and Minerals

Attachment

APPENDIX IV

Attachment

Specific Comments

1) It would be helpful if the names of the countries visited were included early in the digest (pp. i-viii). We feel this would add significantly to the weight of some of the statements made therein.

2) Since the Soviet Union is mentioned (page 4) for possible designation as a reciprocating state, the Soviet domestic legislation should be noted with that of the other nations (pages 12-13).

3) The fact that Japan and France are playing an active role in the creation and development of national ocean mining industries does not represent a special case. Many nations, especially Japan, have far different policies, than does the United States, regarding the degree of government involvement in their industries. Since Japan is a resource-poor, industrialized nation with no land-based, domestic supply alternative, a strong commitment to ocean mining would be expected.

   The report refers to the Japanese and French ocean mining programs as "impressive" and states specific amounts of financial expenditures and budget authorizations. However, the monetary outlays of only one U.S. consortium are noted. The entire size of the U.S. ocean mining effort should be presented so that the reader can accurately assess this nation's commitment relative to those of Japan and France.

4) One of the objectives of the Bureau of Mines is to assure the Nation continued mineral supplies at the lowest possible cost, so it is economics rather than "tradition" (page 46) that focuses Bureau priorities on land-based mineral development.

   Along this line, the report notes that "seabed mining is only one alternative to help the United States to be more mineral self-sufficient." Significant amounts of some of the metals available from ocean minerals are currently imported by the United States, but some domestic land-based resources of those metals have been identified, and areas of great mineral resource potential, such as Alaska, have not been adequately explored or developed. Should it be deemed desirable to encourage domestic production of these minerals by "enhancing the climate for private investment," a compelling case could be made for utilizing many of the same economic incentive programs promulgated in this report for ocean minerals, for the exploration and development of potential and existing land-based resources.

5) Polymetallic sulfides are listed on page 5 as potential sources of 11 minerals. Tin, which is found in ore deposits associated exclusively with granitic rocks as the oxide cassiterite, has not to our knowledge been mentioned in the literature as a potential associate of the seabed polymetallic sulfide deposits. Conversely, the metals chromium, barium, and strontium which are not listed have been reported as constituents of deposits on the East Pacific Rise (12° South to 16°) by Bostrom and Peterson 1966, Econ. Geol., Volume 61, pp. 1258-1265, although in only small amounts.

6) The implication is made on page 41 that the polymetallic sulfides are a less capital-intensive resource than the metalliferous oxides on the seabed. We believe that there are insufficient data at this time to substantiate this statement.

7) Polymetallic sulfides are being viewed with considerable interest, but it must be emphasized that a great deal of basic research on these deposits remains to be required to delineate their resource potential. The discussion of polymetallic sulfides vs. nodules (pages 41-42) should reiterate the importance of the location of some of the sulfide deposits within the U.S. 200-mile limit, and the differences in metal content between sulfides and nodules. The following additional points should also be made Actual excavation of sulfides would be altogether different than for nodules, the grade of sulfides is higher, resulting in less tailings disposal problems.

8) Public Law 85-701, "To provide a program for the discovery of the mineral sources of the United States, its territories, and possessions by encouraging exploration for minerals . . ." (1958) might be added to the list of encouraging legislation. Large seabed areas within 200 miles of land under U.S. jurisdiction or control might have potential for the discovery of new deposits of metal oxides or sulfides not subject to international control, were the U.S. to assert control on an exclusive economic zone.

9) With respect to the study and analyses recommended by GAO to be performed by the Office of Science and Technology Policy, we feel (1) that OSTP clearly has a major role to play in the performance of the analyses which will be fundamental to the establishment of the United States policy, (2) that the Geological Survey could contribute significant expertise to the scientific and cost-benefit analyses required, (3) an assessment performed with the Bureau of Mines Minerals Availability System would be an immense, long-term task utilizing engineering and economic analysis. (The MAS provides current appraisals of the availability of nonfuel minerals through the systematic engineering and economic evaluation of significant mineral deposits throughout the world by developing a repository of in-depth, site-specific information on worldwide mineral occurrences backed by professional engineering and mineral economics expertise.) However, the data required for this type of detailed assessment of ocean minerals would require applied research on seabed mining technology, and engineering and economic analysis of selected seabed deposits Appraisals of the various land-based alternatives, such as Alaska, Stillwater deposits, etc., to be used for comparison would require the same information, which also needs to be developed), (4) that the study, whoever it is performed by, should be performed under the general guidance, direction, and leadership of the Cabinet Council on Natural Resources and the Environment

10) The report contains unsubstantiated statements that, if accurate, would render the recommended ocean mining viability assessment unnecessary. For example, it is stated (page 4) that P.L. 96-283, the Deep Seabed Hard Minerals Resources Act of 1980 identifies the deep seabeds as a "viable alternative to land-based sources of supply " (The terminology "desirable alternative" (page 7) seems more appropriate, and in the discussion of polymetallic sulfides (pages 41-42), the reader is informed that ". . in 10 to 15 years . ocean mining becomes an economically viable proposition.")

APPENDIX V

**United Nations**
Law of the Sea Conference
Final part of 11th session
Montego Bay, Jamaica
**Department of Public Information**

**Press Release**

SEA/MB/12
10 December 1982

193rd Meeting (AM)

UNITED NATIONS CONVENTION ON THE LAW OF THE SEA
OPENED FOR SIGNATURE, 119 DELEGATIONS SIGN

Fiji Is First to Ratify

A total of 119 delegations to the Third United Nations Conference on the Law of the Sea today signed the Convention on the Law of the Sea, as it was opened for signature in Montego Bay, Jamaica

The total includes 117 States, the Cook Islands (a self-governing associated State) and the United Nations Council for Namibia

In addition to signing the Convention -- with each delegation's signature affixed on a separate page of the dark blue leather-bound volume -- they also signed the Final Act of the Conference In addition, 23 States which did not sign the Convention joined in signing the Final Act, a record of the Conference The total number of Final Act signatures was 150, including nine observer delegations and the United Nations Council for Namibia

The President of the Conference, Tommy T B Koh (Singapore), announced that Fiji had also ratified the Convention, becoming the first State to do so

The Convention will enter into force one year after 60 States have ratified or acceded to it

Signers of Convention

Following is a list of the delegations which signed the Convention today

Algeria, Angola, Australia, Austria, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Bhutan, Brazil, Bulgaria, Burma, Burundi, Byelorussia, Canada, Cape Verde, Chad, Chile, China, Colombia, Congo, Costa Rica, Cuba, Cyprus, Czechoslovakia, Democratic People's Republic of Korea, Democratic Yemen, Denmark, Djibouti, Dominican Republic, Egypt, Ethiopia, Fiji, Finland, France, Gabon, Gambia, German Democratic Republic, Ghana, Greece,

APPENDIX V

Grenada, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Ivory Coast, Jamaica, Kenya, Kuwait, Lao People's Democratic Republic, Lesotho, Liberia, Malaysia, Maldives, Malta, Mauritania, Mauritius, Mexico, Monaco, Mongolia, Morocco, Mozambique, Nauru, Nepal, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Philippines, Poland, Portugal, Romania, Rwanda, Saint Lucia, Saint Vincent and the Grenadines, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, Sri Lanka, Sudan, Suriname, Sweden, Thailand, Togo, Trinidad and Tobago, Tunisia, Tuvalu, Uganda, Ukraine, USSR, United Arab Emirates, United Republic of Cameroon, United Republic of Tanzania, Upper Volta, Uruguay, Vanuatu, Viet Nam, Yemen, Yugoslavia, Zambia and Zimbabwe

In addition to these States, the Convention was also signed by the United Nations Council for Namibia, and by the Cook Islands

Final Act Signatures

States signing the Final Act, in addition to all the above, are as follows

Belgium, Benin, Botswana, Ecuador, Equatorial Guinea, Federal Republic of Germany, Holy See, Israel, Italy, Japan, Jordan, Libya, Luxembourg, Oman, Peru, Republic of Korea, Samoa, Spain, Switzerland, United Kingdom, United States, Venezuela and Zaire

The Final Act was also signed by the African National Congress of South Africa, the European Economic Community, the Netherlands Antilles, the Palestine Liberation Organization, the Pan Africanist Congress of Azania, the South West Africa People's Organization, the Trust Territory of the Pacific Islands and the West Indies Associated States

(A round-up release on the Conference will be issued later today as Press Release SEA/MB/13, parts A and B )

Signing Ceremony

The signing ceremony lasted two hours and 40 minutes Participants were called upon to sign in English alphabetical order of the names of their delegations, beginning with Pakistan -- the State chosen by lot to sit during 1982 at the front left position in plenary meetings of the Conference

A copy of the Convention stood on the dais during the ceremony while delegations signed a separate book of signatures The copy, nearly 7 inches thick, bore on its spine the name of the Convention in gilt letters in the Conference's six official languages -- Arabic, Chinese, English, French, Russian, and Spanish Embossed on the cover were the seals of the United Nations and the Conference

APPENDIX V

Before States were called on to sign, the Final Act was signed by President Koh, by Bernardo Zuleta, Special Representative of the Secretary-General to the Conference, and by David Hall, Executive Secretary of the Conference

A second copy of the Convention was turned over to Frank Francis, Secretary in the Foreign Ministry of Jamaica It will be open for signature at the Foreign Ministry in Kingston for two years Also, beginning 1 July 1983, the Convention will be open for signature at United Nations Headquarters, New York It will be closed for signature at both places on 9 December 1984, but States will be able indefinitely to accede to it -- a process which does not require signature

At the start of this morning's meeting, the Conference approved the report of its Credentials Committee (document A/CONF 62/123), which met yesterday, 9 December, and accepted the credentials submitted by all 144 delegations of States and the Council for Namibia participating in the current session (for list, see Press Release SEA/MB/10)

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