

Deep Seabed Exploitation

*John Warren Kindt**

TABLE OF CONTENTS

I. Introduction	1
II. Deep Seabed Exploitation	4
A. Delimitation of Problems.....	4
B. Goals	12
C. Historical Background	17
D. Trends and Conditioning Factors	33
E. Policy Alternatives and Recommendations	38
III. The Law of the Sea Provisions	44
Appendix I: Deep Seabed Mining Consortia	50
Appendix II: Summary of Marine Environmental Consequences	52
Appendix III: Cumulative World Demand for Nodule Metals and the Deep Seabed Contribution	56

I.

INTRODUCTION

Exploitation of the nonliving resources of the deep seabed involves many different types of minerals, including oil and gas. This analysis will focus on a specific mineral resource, manganese nodules, because: (1) the dispute at the Third United Nations Conference on the Law of the Sea (UNCLOS III) over the exploitation of these nodules caused the United States and other developed nations to refuse to accede to the final Convention on the Law of the Sea (LOS Convention),¹ and (2) the environmental consequences of mining manganese nodules are still uncertain. The "deep seabed"

* Professor of Law, University of Illinois at Urbana-Champaign. The author wishes to acknowledge the valuable assistance of David Nelson in the preparation of this Article.

1. Done Dec. 10, 1982, U.N. Doc. A/CONF.62/122 reprinted in 21 I.L.M. 1261 (1982) [hereinafter cited as LOS Convention]. See generally, Whitney, *Environmental Regulation of United States Deep Seabed Mining*, 19 WM. & MARY L. REV. 77 (1977) [hereinafter cited as Whitney].

refers to that part of the ocean floor beyond the national jurisdiction of any nation.

Manganese, copper, cobalt, and nickel, which are all important to U.S. industry, are among the twenty metallic elements found in manganese nodules. Manganese is necessary to produce steel, but the United States has only small amounts of manganese ore and these deposits are low-grade.² The leading producers of manganese ore are the USSR, South Africa, Brazil, China, India, Gabon and Australia.³ Copper is used primarily by the electrical, construction, machinery, and transportation industries.⁴ The United States is the world's largest producer of copper, followed by Chile, the USSR, Canada, Zambia, Zaire, and others.⁵ Cobalt is used in making steel alloys and other alloys; none is mined in the United States.⁶ The biggest sources of cobalt are the mines in Zaire and Zambia. Canada, the USSR, Cuba, and Australia are other important cobalt mining nations.⁷ Nickel is used in steel alloys and other alloys, and in electroplating.⁸ Canada and the USSR are the largest miners of nickel. New Caledonia, Australia, Cuba and the Phillipines are also major nickel mining countries.⁹ The United States produces relatively small amounts of nickel ore.¹⁰

Since the United States must import manganese, cobalt and nickel and perhaps, in the future, copper, it would help the U.S. balance of trade, and also promote U.S. security interests, if these minerals could be obtained from a source not controlled by other countries. The deep seabed may be such a source.

In November 1974, Deepsea Ventures Inc. (a subsidiary of Tenneco, Inc.) filed a claim with the Secretary of State seeking exclusive mining rights in a 60,000 square kilometer area of the East Pacific.¹¹ This claim demonstrated the willingness of U.S. industry to develop the necessary technology to extract these nodules.¹² The arguments for development of the nodule mining industry are compelling. However, environmental concerns must be considered, not only in

2. 1 U.S. DEP'T INTERIOR, MINERALS YEARBOOK, METALS AND MINERALS 574 (1981).

3. *Id.* at 581.

4. *Id.* at 282.

5. *Id.*

6. *Id.* at 258-59.

7. *Id.* at 265.

8. *Id.* at 616-17.

9. *Id.* at 624-25.

10. *Id.*

11. Biggs, *Deepsea's Adventures: Grotius Revisited*, 9 INT'L LAW. 271, 271 (1975).

12. *Id.*

deciding whether to mine the seabed, but also in formulating the conditions governing this activity.¹³

Manganese nodules were discovered in 1876.¹⁴ They usually resemble charcoal briquettes but can grow to be as large as footballs.¹⁵ The regeneration period for nodules significantly distinguishes them from other ocean resources. Although the method and speed of nodule formation are unknown, it is theorized that nodules form through chemical precipitation. Their growth rate is projected as 1 to 10 millimeters per one million years.¹⁶ If this theory is correct, nodules are essentially a nonrenewable resource; however, since pull tabs from cans have been found inside nodules, the growth rate may be much faster. Estimates of worldwide manganese nodule deposits "vary from hundreds of millions to trillions of tons of ore."¹⁷

One of the most economically promising areas for the mining of manganese nodules is an east-west belt in the east central Pacific Ocean, just south of Hawaii. The size of this area is approximately 13 million square kilometers (3.8 million nautical square miles), and it was the subject of the Deep Ocean Mining Environmental Study (DOMES),¹⁸ which formed the basis of many of the scientific findings presented in the Final Programmatic Environmental Impact Statement on Deep Seabed Mining (Seabed EIS)¹⁹ completed by the National Oceanic and Atmospheric Administration (NOAA). DOMES was a cooperative NOAA/industry research effort conducted between 1975 and 1981.²⁰

Until the late 1960's there was little interest in deep seabed mining because the technology did not exist to mine these nodules.

13. Frank, *Environmental Aspects of Deepsea Mining*, 15 VA. J. INT'L L. 815, 817 (1975) [hereinafter cited as Frank].

14. *Id.* at 815.

15. *Id.* at 816.

16. See Heath, *Manganese Nodules and Mineral Deposits*, in UNIV. OF CAL., SANTA BARBARA, MARINE SCIENCES AND OCEAN POLICY SYMPOSIUM, JUNE 17-20, 1979, at 129, 131; see Note, *A New Combination to Davy Jones' Locker: Melee Over Marine Minerals*, 9 LOY. U. CHI. L.J. 935, 937 (1978) [hereinafter cited as *New Combination*] (1-7 millimeters per 1 million years). *Contra*, J. MERO, *THE MINERAL RESOURCES OF THE SEA* 154 (2d ed. 1969) (1 millimeter per 1,000 years).

17. *New Combination*, *supra* note 16, at 937.

18. DOMES refers collectively to two reports: NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEP'T COMMERCE, PROJECT DEVELOPMENT PLAN: DOMES DEEP OCEAN MINING ENVIRONMENTAL STUDY (1977); NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEP'T COMMERCE, TECHNICAL DEVELOPMENT PLAN: DOMES DEEP OCEAN MINING ENVIRONMENTAL STUDY (1977).

19. 1 NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEP'T COMMERCE, DEEP SEABED MINING: FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT xv (1981) [hereinafter cited as SEABED EIS].

20. *Id.* at xvi.

However, by the late 1970's ocean mining technology had advanced to the point where consortia from several developed nations were prepared to proceed with deep seabed mining.²¹

In 1981, the deepsea mining industry consisted of six international consortia, but only four of these included U.S. companies as members. These consortia tested engineering systems, explored potential sites and collected environmental data. Under licenses from NOAA, only exploration and research would be conducted until 1988. Beginning January 1, 1988, commercial mining by U.S. companies would be commenced once they obtained NOAA permits and complied with other applicable laws and regulations.²²

The challenge facing decision-makers is balancing potential economic benefits and national security against the costs of mounting mining expeditions far from land in waters three to five kilometers deep.²³ If the balance favors development, mining companies may exploit the deep seabed without adequate consideration of the environmental ramifications.

II.

DEEP SEABED EXPLOITATION

A. Delimitation of Problems

Prior to 1977, no formal regulatory standards existed for deep seabed mining operations.²⁴ Existing laws and regulations covered export control, taxes, trade, maritime activities and occupational health and safety,²⁵ but not the environment. Environmentalists feared deep seabed mining would begin without a law of the sea treaty to protect environmental concerns. This fear prompted environmentalists to call for legislation protecting the environment.²⁶

Environmentalists envisioned sediment and "near bottom" water being carried to the surface by suction-like mining equipment, unless this equipment was designed to discharge these elements within the water column itself. The colder and denser "near bottom" water could injure marine life not adapted to it. In addition, the red

21. *See generally id.*

22. 30 U.S.C. § 1412(c)(1)(D) (1982); *see SEABED EIS, supra* note 19, at 7.

23. Brewer, *Deep Seabed Mining: Can An Acceptable Regime Ever Be Found?*, 11 OCEAN DEV. & INT'L L.J. 25, 28 (1982); Burton, *Freedom of the Seas: International Law Applicable to Deep Seabed Mining Claims*, 29 STAN. L. REV. 1135, 1137 (1977) [hereinafter cited as Burton].

24. *See* Whitney, *supra* note 1, at 78.

25. *Id.*

26. *New Combination, supra* note 16, at 952.

clay sediment discharged during deep seabed manganese nodule exploitation would form a "dark plume" or "red plume" over a large area of water surface, and it could "fundamentally change the character of the euphotic zone in the area."²⁷ It was predicted that mixing the water and sediment from the ocean floor with the surface water could "cause a stimulation of photoplankton and blooms of organisms which do not normally occur in the pelagic zone of areas overlying manganese nodule concentrations"²⁸

Another potential problem is the suspension of lifted sediments in the water column. These suspended sediments may cause "the transplantation of spores or other dormant forms of organisms from one area to another, where favorable temperature, light, and oxygen conditions in the overlying water may reactivate them."²⁹ In a similar manner, alien antibodies may be released from the ancient spores and organisms lying in the sediment removed from the seabed, infecting plant and animal life in incalculable ways.³⁰ Confronted with these considerations, the United States enacted the Deep Seabed Hard Mineral Resources Act of 1980 (Seabed Resources Act).³¹

Three basic manganese nodule mining techniques exist: (1) airlift pumping (ALP), (2) hydraulic or hydrolift dredging (HD), and (3) continuous line bucket dredging (CLB). The ALP system involves a three-phase flow of air, water, and nodules. Compressed air is injected into a pipe forcing water, nodules, and the surrounding sediment into the bottom end of the pipe.³² The HD system is similar to the ALP, but it utilizes only pumped water to create an upward flow through the pipe.³³ The CLB technique utilizes dredge buckets attached to a long, continuous rope. The buckets are dragged along the bottom of the ocean scooping up nodules while the host ship moves along the surface.³⁴ Both the ALP and HD systems involve transporting nodules, sediment and deep water to the surface.³⁵ The CLB mechanism is designed to hoist only the nodules to the ocean surface, although some sediment may be

27. Frank, *supra* note 13, at 818.

28. *Id.*

29. Whitney, *supra* note 1, at 80.

30. *Id.*

31. Pub. L. No. 96-283, 94 Stat. 553 (1980) (codified at 26 U.S.C. §§ 4495-4498 (1982 and 30 U.S.C. §§ 1401-1473 (1982))).

32. Whitney, *supra* note 1, at 78-79.

33. *Id.*

34. *Id.* at 79.

35. *Id.* at 80.

trapped by this process and later dispersed through the water column.³⁶

A disturbance of biological activity and of sediment is likely to occur with a suction or a bucket system as it travels across the ocean floor.³⁷ It is argued that this disturbance will be insignificant since: (1) bottom currents naturally transfer deepsea sediment; (2) most of the sediment will settle; and (3) most of the ocean bottom where mining will occur in an area with minimal biological activity.³⁸ However, there could be far reaching effects on late-pubescent fauna, such as the benthic clam, which takes two hundred years to reach sexual maturity.³⁹ Deepsea mining will diminish the reproductive capacities of some species and thereby endanger them.⁴⁰

The processing of nodules on ships presents another potential problem. Apparently, most U.S. mining companies will extract only cobalt, copper, and nickel from the nodules, leaving large amounts of wastes, including manganese tracings. The remaining mineral wastes must be disposed of, either on land or at sea.⁴¹ Concomitantly, highly polluting chemicals used in the extraction process, such as heavy alkaline and acid bases, would also be dumped.⁴² Clearly, the orderly development of deep seabed mining requires a regime of law that addresses both the regulatory and environmental aspects of this activity.⁴³

The environmental problems that might be caused by processing at sea were not addressed in the Seabed EIS because this method of processing was there deemed impracticable.⁴⁴ The motion of the ship at sea would make processing very difficult and costly.⁴⁵ Since much new technology would have to be developed, offshore processing is not expected during the first generation of commercial mining.⁴⁶

Proponents of unilateral U.S. legislation for deep seabed mining argued that it would help the United States obtain independence

36. *Id.*

37. Frank, *supra* note 13, at 818.

38. *Id.*

39. *Id.*

40. *Id.* at 818-19.

41. *Id.* at 819.

42. *Id.*

43. Whitney, *supra* note 1, at 81.

44. SEABED EIS, *supra* note 19, at xix.

45. *Id.* at 229-30.

46. *Id.* at xix.

from foreign exports and reduce its vulnerability to volatile international markets.⁴⁷ It was believed that international opposition to this U.S. legislation would remain at levels tolerable to U.S. diplomats negotiating in international forums. Even so, the main reason behind the enactment of the Seabed Resources Act was the perception of the U.S. Congress that the deepsea mining regime formulated at UNCLOS III was a system contrary to basic U.S. interests.⁴⁸

The minerals extracted from manganese nodules are of critical importance to the heavy industries of the United States. The fact that the United States imports nearly all of its manganese and cobalt, 71 percent of its nickel and 15 percent of its copper, places the U.S. economy and national security at risk.⁴⁹

Four factors make the source of a mineral a particularly important matter: "(1) the critical need for the mineral in defense or industry, (2) the lack of adequate domestic resources, (3) the limited potential for developing substitutes, and (4) the lack of alternative or more secure sources of supply."⁵⁰ The United States is vulnerable in each of these areas as to cobalt and manganese.

U.S. access to deep seabed nodules would mean a stable supply of these minerals, lower prices, and balance-of-trade advantages.⁵¹ Although competition from deep seabed mining will mean lower returns to approximately a dozen land-based mineral exporting countries, it has been suggested that "the availability of these new supplies will have a favorable effect on the development objectives of most of the world by maintaining lower material costs than would otherwise be experienced."⁵²

Self-sufficiency in any mineral vital to the economy is a justifiable goal for any country and can only help its economy.⁵³ Although the technology requisite for seabed mining has been available since the mid-1970's, the uncertainty of the ongoing negotiations at UNCLOS III generally deterred substantial investment and develop-

47. Murphy, *The Politics of Manganese Nodules: International Considerations and Domestic Legislation*, 16 SAN DIEGO L. REV. 531, 548 (1979) [hereinafter cited as Murphy].

48. Caron, *Municipal Legislation for Exploitation of the Deep Seabed*, 8 OCEAN DEV. & INT'L L.J. 259, 286 (1980).

49. Murphy, *supra* note 47, at 534.

50. Jones, *Onshore and Offshore Solutions to the Nonfuel Minerals Shortage*, 1982 B.Y.U. L. REV. 617, 623-24.

51. Frank, *supra* note 13, at 816.

52. *Id.*

53. Ott, *An Analysis of Deep Seabed Mining Legislation*, 10 NAT. RESOURCES LAW. 591, 595 (1977) [hereinafter cited as Ott].

ment in seabed mining⁵⁴—a condition which was changed somewhat in the United States due to enactment of the Seabed Resources Act in 1980. The Seabed Resources Act was designed to provide stability of investment of the U.S. seabed mining industry, pending a final law of the sea treaty.⁵⁵

From a historical perspective, it was predicted during UNCLOS III that the United States and the developing nations would both benefit from compromising on the seabed mining problem.⁵⁶ A compromise would assure the United States and other deepsea mining nations of: (1) international recognition of title to the nodules recovered; (2) international recognition of exclusive mining sites; and (3) enjoyment of strategic benefits, unavailable under customary international law, which would become available to the United States and other developed countries under the LOS Convention.⁵⁷ The United States would also gain in prestige among developing nations. The developing nations would gain economically as they received their share of the profits from deep seabed mining. They would also gain symbolically by demonstrating the success of the United Nations negotiating process and by redressing the economic imbalance between developed and developing nations.⁵⁸

The continuity problems of UNCLOS III with regard to deep seabed mining were summarized as follows:

- a. *Access*: Who should be authorized to exploit the Area?
- b. *Control of the Authority* (and of exploration and exploitation): What is the relationship between the Assembly and the Council, what are their respective powers, and what regime governs the composition and voting system of the Council?
- c. *Regulatory discretion of the Authority*: What are the conditions inherent in exploration/exploitation contracts and what is the continuing rulemaking power of the Authority?
- d. *Resource policy*: To what extent may the Authority restrict seabed production to relieve disadvantaged land-based producers (LBP's)?
- e. *The maintenance of a viable Enterprise*: To what extent must

54. Pietrowski, *Hard Minerals on the Deep Ocean Floor: Implications for American Law and Policy*, 19 WM. & MARY L. REV. 43, 46 (1977) [hereinafter cited as Pietrowski].

55. 30 U.S.C. §§ 1441-44 (1982).

56. Arrow, *The "Alternative" Seabed Mining Regime: 1981*, 5 FORDHAM INT'L L.J. 1, 31 (1981).

57. *Id.* at 31-32.

58. *Id.* at 32-33.

the viability of the Enterprise be insured and who must insure it?

- f. *The divisions of revenues*: What kind of revenue sharing will be employed (royalty or profit-sharing) and in what proportions?
- g. *The Enterprise as a competitor*: To what extent should the Enterprise have preference with regard to operations, regulation and financial arrangements?
- h. *Quotas*: To what extent should countries or their nationals be individually limited with regard to development of mineral resources?
- i. *Confidentiality of proprietary information*: To what extent must countries or mining companies reveal trade secrets?
- j. *Dispute settlement*: Who shall have access to the Seabed Tribunal—when and under what conditions?—and will its jurisdiction be exclusive?
- k. *Finances for the Authority and Enterprise*: How is the initial capital to be raised and what are to be the responsibilities of countries for the continuing financing of the Authority and the Enterprise?⁵⁹

Allegedly, the first five of these problems were the most crucial deep seabed problems facing UNCLOS III.⁶⁰ These complicated problems also reveal some of the reasons for the impasse between the developed countries (particularly the United States) and the developing countries with regard to the deep seabed mining provisions of a law of the sea treaty.

With respect to the United States, there were several problem areas involved in deepsea mining, and the United States made six specific objections. First, the United States believed that the LOS Convention and prior negotiating texts deterred the development of deep seabed resources that were necessary to meet both U.S. and international demand.⁶¹ Those policies enumerated in the LOS Convention that tended to curb the development of seabed resources included:

- a. the policies of the International Sea-bed Authority (ISA) which were designed to regulate seabed mining and which gave priority to concerns other than those encouraging efficient and economic resource development;

59. See J. HARRY, DEEP SEABED MINING IN THE LAW OF THE SEA NEGOTIATION (I): THE CONTOURS OF A COMPROMISE 3 (Center for Oceans Law & Pol'y, Feb. 1978).

60. *Id.*

61. Bureau Pub. Affairs, U.S. Dep't State, Law of the Sea: Current Policy No. 371, at 2 (Jan.-Feb. 1982).

- b. the production ceiling which sets limits on the amount of minerals which could be mined;
- c. the limit placed on the number of mining operations that any one country could conduct, thus potentially restricting the ability of the United States to supply its consumption demands from the seabed;
- d. the discretionary nature of the administrative and regulatory policy areas which could discourage deep seabed mineral development if implemented in accordance with the production policies of the ISA.⁶²

Second, the policies set forth in the LOS Convention (1) did not guarantee all qualified national and commercial applicants the seabed minerals they required, and (2) gave the operating arm of the ISA, the Enterprise, an opportunity and an incentive to establish a monopoly over the resources.⁶³

The LOS Convention provided no assurance that qualified private applicants that were sponsored by the United States would be awarded deep seabed mining contracts.⁶⁴ The United States believed that a contract should be granted to any qualified applicant. Unless there was a determination by objective technical experts that the applicant's qualifications were improperly or falsely certified, the United States believed, the ISA should be required to accept the certification provided by the sponsoring country.⁶⁵

The United States also desired "grandfather clause" provisions to protect the legal and commercial rights of pioneer investors who had already made substantial investments in deep seabed mining.⁶⁶ It argued that "[d]eep seabed mineral resources . . . [would] not be made available . . . without the continuing efforts of pioneer miners."⁶⁷

Similarly, the United States opposed the system of privileges created by the LOS Convention, which discriminated against the private side of the parallel system for mining the seabed.⁶⁸ Under the provisions of the LOS Convention, private companies could be manipulated into entering joint ventures either with developing countries or with the Enterprise, and this structure could permit the Enterprise to establish *de facto* monopolistic control over deep sea-

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

66. *Id.*

67. *Id.*

68. *Id.* at 3.

bed mineral resources.⁶⁹

The third objection of the United States to the LOS Convention was particularly important to policy-oriented decision-makers. The LOS Convention did not provide the United States with a decision-making role concerning the deep seabed regime which fairly reflected and effectively protected the economic, political, and financial interests of the United States.⁷⁰

The United States had the potential for being not only the largest financial contributor to the Enterprise, but also the largest consumer of deep seabed minerals.⁷¹ Accordingly, it was necessary that the United States have influence in the decision-making process sufficient to protect its economic, political, and financial interests.⁷² This influence was not secured by the LOS Convention and the United States could have been completely excluded from the decision-making process.

The next U.S. objection was to the procedure to be followed when the LOS Convention was amended. Two-thirds of the member States acting at the scheduled review conference could adopt amendments that would then become binding on all State parties, regardless of their non-concurrence.⁷³ If the United States or any other country objected to an amendment, it would have only the option of withdrawing from the LOS Convention. This procedure was obviously not acceptable to those countries which have already committed themselves to major economic interests, as well as risked substantial capital investments.⁷⁴ The United States would not allow itself to be bound automatically by amendments without its own approval through the advice and consent of the U.S. Senate.⁷⁵

The United States also asserted that the LOS Convention would establish undesirable international legal precedents.⁷⁶ These precedents included artificial limits on the production of minerals and the mandatory transfer of seabed mining technology from the developed countries to the underdeveloped countries.

The sixth and final objection of the United States in the LOS Convention would probably not be approved by the U.S. Senate.⁷⁷

69. *Id.*

70. *Id.*

71. *Id.*

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.*

77. *Id.*

Provisions such as the mandatory transfer of private technology, and the participation by and funding of national liberation movements, such as the Palestine Liberation Organization, would not be acceptable. The provisions of the LOS Convention would also impose commercial and economic hardships upon the private companies required to transfer their advanced technology in a forced sale.⁷⁸ In an attempt to outline U.S. objections to some of the provisions in the LOS Convention, the United States proposed a series of amendments to the UNCLOS III negotiators on March 11, 1982.⁷⁹ This package was popularly known as the "Green Book," and was a formal version of a paper which the United States delegation had circulated during the intersessional meeting of February 24 to March 2, 1982.⁸⁰ The paper had outlined the major U.S. concerns regarding the deep seabed mining provisions, and it proposed several solutions.⁸¹ The Green Book was designed to formulate the U.S. proposals in specific textual language.⁸² In circulating the Green Book, the U.S. delegation asserted that the proposed amendments were negotiable and constituted only some of a number of possible solutions. The U.S. delegates declared that no ultimatum was intended.⁸³ They emphasized that the only purpose of the "Green Book" was to provide specific textual language.⁸⁴ However, the Green Book made it apparent to the other delegations that the six U.S. objections could not be satisfied without substantive changes in the negotiating text of the LOS Convention, which had been generally accepted by the other countries participating in UNCLOS III. Accordingly, the Green Book prompted a significant hostile reaction from many of those countries.⁸⁵

B. Goals

The five major goals of an ocean foreign policy are: (1) security;

78. *Id.* at 4.

79. U.S. Dep't State, Report Of the United States Delegation to the Eleventh Session of The United Nations Conference on the Law of the Sea, March 8 - April 30, 1982, at 2 (June 1982) [hereinafter cited as Eleventh Session Report].

80. *Id.* at 1-2.

81. *Id.* at 2.

82. *Id.*

83. *Id.*

84. *Id.*

85. *Id.* at 2-3. For an analysis of the policies of the Reagan Administration regarding UNCLOS III, see Larson, *The Reagan Administration and the Law of the Sea*, 11 OCEAN DEV. & INT'L L.J. 297 (1982). See also Comment, *The Third United Nations Conference on the Law of the Sea: Questions of Equity for American Business*, 4 NW. J. INT'L L. & BUS. 172 (1982).

(2) management (avoidance, reduction, and settlement) of conflict; (3) promotion of efficiency and fair access in ocean use; (4) protection of the environment; and (5) promotion of scientific knowledge.⁸⁶ However, a sixth goal is the "maintenance of a favorable legal order," which impacts upon the other five major goals.⁸⁷ The maintenance of such a favorable legal order requires "a regime for deep seabed mining that will ensure the right of access to deep seabed minerals while reasonably implementing the principle of the 'common heritage of mankind' for the benefit of developing nations; . . ." ⁸⁸ Of the five major goals, the "management of conflict" also seeks to promote "fairness and justice in allocation of ocean resources,"⁸⁹ that is, of deep seabed resources. However, the most important of the five major goals is the "promotion of efficiency and fair access in ocean use."⁹⁰ Five of its seven subgoals affect deep seabed mining issues. Those five are:

- a. the maintenance of fair access to ocean resources;
- b. the protection of the integrity of ocean investment;
- c. the avoidance of international monopolies or practices that unfairly restrict competition or create substantial economic inefficiencies;
- d. the full utilization of ocean resources via environmentally safe methods to meet human needs; and
- e. "in the event of seriously anti-competitive or unfair international or foreign national practices that cannot be immediately altered,"⁹¹ the maintenance of at least equally favorable treatment for U.S. firms.⁹²

The major goal of "protection of the environment" also requires adequate environmental safeguards relating to all of the potential environmental problem areas. The Seabed Resources Act manifests this concern and requires a Deep Ocean Mining Environmental Study (DOMES)⁹³ and a programmatic environmental impact statement (EIS).⁹⁴

The basic problems are further complicated. There is little scientific knowledge about maintaining the marine environment, while

86. Moore, *A Foreign Policy for the Oceans*, in CENTER FOR OCEANS LAW & POLICY, *THE OCEANS AND U.S. FOREIGN POLICY* 1, 2 (1978).

87. *Id.* at 2.

88. *Id.* at 4.

89. *Id.* at 2.

90. *Id.*

91. *Id.*

92. *Id.*

93. 30 U.S.C. § 1419(a) (1982).

94. *Id.* § 1419(c).

much is known about disturbing it. Various economic, political, and institutional considerations will probably outweigh public support for strong environmental regulation. Finally, there are many potential conflicts of interest within the ISA.⁹⁵ However, the U.S. government, the deep seabed industry, and scientists are collaborating to collect reliable information about the impact of deep seabed mining upon the ocean floor.⁹⁶ In 1981 NOAA completed the Seabed EIS.⁹⁷ Pursuant to policies suggested in the Seabed EIS, NOAA would require monitoring of the environment during mining equipment testing by the seabed mining industry.⁹⁸ Under the Seabed Resources Act, the Secretary of State may not designate a foreign nation as a reciprocating State for deepsea mining purposes unless that nation requires those mining under its authority to protect the environment.⁹⁹ Thus, those nations that want the United States to honor their deepsea mining claims must institute satisfactory measures to protect the marine environment.

The need for independently generated information is more urgent with respect to environmental issues than in any other area.¹⁰⁰ These data must be independent of data generated by commercial and developmental concerns.¹⁰¹ Under the Seabed Resources Act, NOAA must prepare an EIS for each license or permit it issues under the Act.¹⁰² During consideration of the Seabed Resources Act, environmentalists argued that the proposed rule-making authority was not sufficiently linked to legislation intended to protect the ocean environment.¹⁰³ They also believed that specific provisions were needed to regulate the amount of sediment discharge.¹⁰⁴ The ocean environment received a low priority, since under the "balancing test for modification" the environmental injury had to "outweigh both the national interest in the minerals, and the burden of economic loss."¹⁰⁵ This standard was difficult to meet, because the national interest in the minerals was a major reason for the orig-

95. Nyhart, *The Interplay of Law and Technology in Deep Seabed Mining Issues*, 15 VA. J. INT'L L. 827, 857 (1975) [hereinafter cited as Nyhart].

96. *Id.* at 857.

97. *See supra* note 19 and accompanying text.

98. *Id.* at xix.

99. 30 U.S.C. § 1428 (1982).

100. Nyhart, *supra* note 95, at 857.

101. *Id.* at 860.

102. 30 U.S.C. § 1419(d) (1982).

103. *New Combination, supra* note 16, at 953.

104. *Id.* at 954.

105. *Id.*

inal legislation.¹⁰⁶ The proposed remedial legislation recognized that U.S. mineral needs would eventually exhaust domestic sources of supply, that the national interest required independence from the export policies of foreign countries, and that the deficit in the U.S. balance of payments caused by the purchase of foreign minerals needed to be alleviated.¹⁰⁷

Mineral exporting nations appear determined to form a cartel, following the successful example of the Organization of Petroleum Exporting Countries (OPEC).¹⁰⁸ The Charter of Economic Rights and Duties of States,¹⁰⁹ adopted by the U.N. General Assembly, asserts a positive right to form producer cartels and a concomitant duty of the developed countries not to resist the goals of these cartels. The Charter further provides that only the less-developed countries may take advantage of this right and that developed nations must to acquiesce.¹¹⁰

Those opposing this view believe that U.S. dependence on mineral imports is different from its dependence on foreign petroleum. The OPEC cartel may constitute a unique case and similar attempts by producers of other minerals would "probably fail for lack of common political and economic objectives."¹¹¹ However, arguments that predict the failure of future cartels because the member countries will be incompatible and unable to interact cohesively are simply not persuasive in light of the success of OPEC.¹¹²

Of course, land-based producers of those minerals that will be mined from the deep seabed fear the potential effects of deepsea mining on their economies.¹¹³ Article 151 of the LOS Convention protects these producers by three basic mechanisms: (1) compensation to developing countries suffering adverse effects from seabed mining; (2) production limits for deepsea miners; and (3) authorization for the ISA to participate in commodity agreements with producer-nations.¹¹⁴

Another goal important to U.S. seabed miners is the protection of

106. *Id.*

107. Whitney, *supra* note 1, at 82.

108. Pietrowski, *supra* note 54, at 44.

109. G.A. Res. 3281, 29 U.N. GAOR Supp. (No. 31) at 50, U.N. Doc. A/9631 (1974).

110. Pietrowski, *supra* note 54, at 44.

111. Ott, *supra* note 53, at 594.

112. Pietrowski, *supra* note 54, at 45.

113. Note, *Deep Seabed Mining: Alternative Schemes For Protecting Developing Countries From Adverse Impacts*, 12 GA. J. INT'L & COMP. L. 173, 174 (1982).

114. *Id.* at 183-85; see LOS Convention, *supra* note 1, art. 151.

their superiority in seabed mining technology. Historically, the representatives of the seabed mining industry argued that forcing them to wait for an international agreement would cause them to lose their technological lead.¹¹⁵ In addition, the possible benefits of the "spinoff" technology derived from developing a pioneer industry is readily apparent from the history of the space program.¹¹⁶ Even so, the cost of allowing some erosion of the U.S. lead was not as damaging as the industrialists would have had Congress believe.¹¹⁷

The development of deep seabed mining requires the maintenance of a favorable legal order that provides stability of investment and addresses the environmental aspects of such mining.¹¹⁸ Since those areas which contain known commercial quantities of manganese nodules are generally located beyond the limits of national jurisdiction as recognized by customary international law, the UNCLOS III negotiations attempted to formulate an acceptable international regime which would govern deep seabed regulatory and environmental matters.¹¹⁹

If pollution from U.S. commercial mining caused harm to the ocean environment there could be serious international conflict. Those countries that depend on fishing, as well as coastal States, would be particularly disturbed.¹²⁰ Since most of the ocean is beyond national jurisdiction, customary international law provides the standards for marine pollution. The U.S. regulations governing deep seabed mining should be at least as stringent as these international standards.¹²¹ In addition, the U.S. standards should meet the environmental standards formulated at UNCLOS III,¹²² because the United States might eventually ratify the LOS Convention and because the Convention's standards for marine pollution may already reflect customary international law. With the exception of the deep seabed mining provisions, the LOS Convention would seem to be "the best evidence today of customary international law."¹²³

115. Ott, *supra* note 53, at 595.

116. *Id.* at 596.

117. *Id.*

118. Whitney, *supra* note 1, at 81.

119. *Id.*

120. Note, *Interim Deep Seabed Mining Legislation: An International Environmental Perspective*, 8 J. LEGIS. 73, 78-79 (1981) [hereinafter cited as *Environmental Perspective*].

121. *Id.* at 79.

122. *Id.* at 79.

123. Remarks by John Norton Moore, *The United States Without the Law of the Sea Treaty: Opportunities and Costs*, Proceedings from the Seventh Annual Conference

Outside the parameters of the LOS Convention, however, customary international law is arguably ineffective in dealing with ocean mining pollution.¹²⁴ The LOS Convention, therefore, contains several anti-pollution provisions.¹²⁵ For example, article 209 provides that seabed mining activities in the Area will be subject to international rules, regulations, and procedures.¹²⁶ Article 194 requires countries to ensure that activities under their control or jurisdiction do not cause pollution damage to other countries. Nations are required to minimize as much as possible: (1) release of toxic, harmful or noxious substances; (2) pollution from vessels; (3) pollution from installations and devices used to explore or exploit the seabed; and (4) pollution from other installations and devices operating in the ocean.¹²⁷

The Seabed Resources Act established global regulation of U.S. nationals engaged in deepsea mining. The Act establishes strong environmental standards, and empowers NOAA to: (1) regulate exploration and mining; (2) issue permits and licenses; and (3) monitor and test the marine environment.¹²⁸ The Administrator of NOAA must require the use of "the best available technologies for the protection of safety, health, and the environment," if the activities would have a significant effect on safety, health or environment, except where benefits are "clearly insufficient" to justify costs of those technologies.¹²⁹ American miners operating in compliance with the Seabed Resources Act and NOAA's regulations would therefore probably not run afoul of international pollution standards.

C. Historical Background

Manganese nodules were discovered in 1876 by a British research ship, the *H.M.S. Challenger*, which was dredging the deep seabed,¹³⁰ but it is only within recent years that top level decision-makers in industry, finance, and government have confronted the issue of developing these mineral resources.¹³¹ Most negotiations con-

of the Center for Ocean Management Studies, University of Rhode Island 107, 111 (June 12-15, 1983) [hereinafter cited as Moore's Remarks].

124. *Environmental Perspective*, *supra* note 120, at 79-80.

125. *Id.* at 83.

126. LOS Convention, *supra* note 1, art. 209.

127. *Id.* art. 194.

128. *Environmental Perspective*, *supra* note 120, at 87.

129. 30 U.S.C. § 1419(b) (1982).

130. Frank, *supra* note 13, at 815.

131. *New Combination*, *supra* note 16, at 935.

cerning the deep seabed involved adoption of territorial boundaries for mining operations. Before 1945, international law allowed a coastal nation to acquire exclusive rights to sedentary species (such as sponges, oysters, and coral) lying on the ocean floor beyond its territorial seas. However, a country's rights to other seabed resources extended only to the seaward limit of its territorial waters. Beyond the territorial sea, "all seabed areas—the continental shelf, the continental slope, the continental rise, and the abyssal ocean floor—were legally identical."¹³² This fact is critical to delimiting the international law that applies to the deep seabed.¹³³ In 1945, these determinations were altered, particularly the limitations dependent upon the boundary of the territorial sea.

Article 1 of the 1958 Convention on the Continental Shelf (Continental Shelf Convention)¹³⁴ defines the "continental shelf" as "the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas"¹³⁵ In 1967, the Permanent Mission of Malta to the United Nations submitted a *note verbale* to the U.N. Secretary-General requesting inclusion in the agenda of an item entitled, "Declaration and treaty concerning the reservation exclusively for peaceful purposes of the sea-bed and of the ocean floor, underlying the sea beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind."¹³⁶ Included in the *note verbale* was a proposed declaration that the mineral wealth of the deep seabed constituted the "common heritage of mankind," ultimately adopted by the U.N. General Assembly.¹³⁷

The first element in formulating an adequate environmental protection process for deep seabed mining is an expedited program to assess the environmental impacts occurring "at each stage of the proposed mining, transporting, and processing operations."¹³⁸ The Seabed Resources Act provides that issuance of a license or permit by NOAA shall constitute "a major federal action significantly af-

132. Pietrowski, *supra* note 54, at 50-51.

133. *Id.* at 51.

134. *Done* Apr. 29, 1958, 1 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. 311 (entered into force June 10, 1964).

135. *Id.* art. 1.

136. 22 U.N. GAOR Annex 3 (Agenda Item 92) at 1, U.N. Doc. A/6695 (1967).

137. U.N. Doc. A/AC.135/1, at 27 (1967); *see* G.A. Res. 2749, 25 U.N. GAOR Supp. (No. 28) at 24, U.N. Doc. A/8028 (1970).

138. Whitney, *supra* note 1, at 86.

fecting the quality of the human environment."¹³⁹ Thus, each permit would theoretically require an EIS under the National Environmental Policy Act of 1969 (NEPA).¹⁴⁰ A DOMES is required, and a programmatic EIS may also be required under the Seabed Resources Act.¹⁴¹ Since there is a problem with overlapping environmental statements (particularly under NEPA), a program of long-term "fate and effects studies" should be adopted. Such a program should eliminate duplication and enhance both development and environmental protection.

In 1972, investigators supported by NOAA tested an experimental CLB mining system.¹⁴² This investigation did not encounter any significant environmental problems. Even so, other investigations have warned that deep seabed mining will produce broad spectrum of significant environmental disturbances.¹⁴³

The effect of full-scale commercial deepsea mining on the environment is unknown. The DOMES project examined a pilot-scale operation,¹⁴⁴ and it has provided NOAA with a basic investigation into the environmental effects of deepsea mining.

As a result of the DOMES analysis, many mining activities have been determined to have a very low probability of creating a negative environmental impact; other activities appear to create a negative impact; while still other concerns are not yet resolved. In addition, NOAA emphasized that because the DOMES testing was pilot-scale, it was essential that the DOMES findings be validated during mining system endurance tests conducted by industry prior to the start of commercial mining.¹⁴⁵ In any event, NOAA concluded that the following potentially significant environmental impacts were "certain" or "likely" to occur: (1) destruction of benthic fauna in and near the collector track caused by the collector itself; (2) disturbance of the ocean bottom, causing increased sedimentation and increased suspended matter in water near the seabed (termed a "rain of fines"); and (3) decreased penetration of light due to increased turbidity in the surface discharge area.¹⁴⁶

Although destruction of benthic populations by the nodule col-

139. 30 U.S.C. § 1419(d) (1982).

140. 42 U.S.C. §§ 4321, 4332(2)(c) (1982).

141. 30 U.S.C. § 1419 (1982).

142. Whitney, *supra* note 1, at 79.

143. *Id.*; see *supra* notes 37-43 and accompanying text.

144. SEABED EIS, *supra* note 19, at 6.

145. *Id.* at 79.

146. NAT'L OCEANIC & ATMOSPHERIC AD., U.S. DEP'T COMMERCE, DEEP SEABED MINING: MARINE ENVIRONMENTAL RESEARCH PLAN 1981-85, at 4 (1982).

lecting devices is clearly an adverse effect, NOAA was unable to determine whether the effect would be significant. Estimates by NOAA concluded that 1.0 percent of the east central Pacific mining area (consisting of thirteen million square kilometers) would be directly affected by nodule collectors during a twenty-year mining period if five mineships were conducting operations. Factors which required further study included: (1) the rate of recolonization; (2) the type of species that recolonize; and (3) the linkage between the benthic and the water column food chains.¹⁴⁷

The "rain of fines" created by the nodule collector will probably smother some of the immobile creatures and create a cover over the food supply of bottom feeders. Future studies are scheduled to examine the effects on ocean flora and fauna, as well as the sediment settling patterns and rates. Suggestions to minimize the environmental impact include improved collector designs, compact mining sites to minimize the impact area, and controlled dispersion.¹⁴⁸ Implementation of these suggestions would serve to minimize the rain of fines and its effects.

Sediment will be brought up with the nodules during mining, and when this sediment is discharged it will create a plume in the surface water. The plume may reduce light penetration and thus impair photosynthesis and primary food production.¹⁴⁹ In this area, NOAA has concluded that during commercial mining the plume from one ship will cause a fifty percent reduction in primary production in an area which is twenty kilometers by two kilometers. However, this plume should disperse in a few days, thus causing little damage.¹⁵⁰ Even so, NOAA recognized that field or laboratory testing would be necessary to test this speculation, since it was based on few firm data.¹⁵¹

NOAA also planned environmental monitoring during subsequent mining trials to verify the conclusions of the Seabed EIS and to detect other significant effects. The monitoring would also help NOAA develop environmental regulations for commercial min-

147. SEABED EIS, *supra* note 19, at 100-02.

148. SEABED EIS, *supra* note 19, at 103-06.

149. See Frank, *supra* note 13, at 818 n.23 (citing U.S. DEP'T INTERIOR, DRAFT ENVIRONMENTAL STATEMENT PROPOSED FOR UNITED STATES INVOLVEMENT IN LAW OF THE SEA NEGOTIATIONS GOVERNING THE MINING OF DEEP SEABED HARD MINERAL RESOURCES SEAWARD OF THE LIMITS OF NATIONAL JURISDICTION 3.28 (1974)).

150. SEABED EIS, *supra* note 19, at 95.

151. *Id.* at 96.

ing,¹⁵² which under the Seabed Resources Act¹⁵³ could begin in 1988.

Since NOAA's findings in the Seabed EIS were based on relatively brief periods of pilot-scale mining, NOAA intended to verify and update these findings by requiring monitoring of demonstration-scale mining tests conducted by industry.¹⁵⁴ Thus, NOAA is uncertain about the environmental impact of full-scale commercial mining of the deep seabed.

Pursuant to the Seabed Resources Act, NOAA in 1981 promulgated regulations regarding exploration licenses.¹⁵⁵ An EIS must be prepared by NOAA for each license.¹⁵⁶ In addition, NOAA must require use of the best available technologies to mitigate significant effects on public safety, public health or the environment, unless benefits from using those technologies are clearly insufficient to justify their costs.¹⁵⁷

The 1974 claim by Deepsea Ventures, Inc. of exclusive mining rights over a large area of the Pacific Ocean is of major significance to deep seabed mining history.¹⁵⁸ Deepsea Ventures did not claim either the seabed or subsoil underlying the deposit. Deepsea Venture's position was that as a freedom of the high seas, the superjacent water column could be utilized to the extent necessary to recover and transport the manganese nodules.¹⁵⁹ The company anticipated only a temporary and restricted disturbance of the deep seabed and subsoil beneath the deposit.¹⁶⁰ Deepsea Ventures also intended to provide accommodations for U.S. government representatives on company vessels utilized in both evaluating and developing the preselected mining site. The processing of the nodules was to occur on land.¹⁶¹

Although the LOS Convention gives the International Sea-bed Authority (ISA) a monopoly position in bargaining over mining the

152. NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEP'T COMMERCE, DEEP SEABED MINING: FINAL TECHNICAL GUIDANCE DOCUMENT 15 (1981).

153. 30 U.S.C. § 1412(c)(1)(D) (1982).

154. SEABED EIS, *supra* note 19, at xix.

155. 30 U.S.C. § 1468 (1982); 15 C.F.R. §§ 970.100-970.2601 (1981).

156. 30 U.S.C. § 1419(d) (1982).

157. 30 U.S.C. § 1419(b) (1982).

158. *See* Burton, *supra* note 23, at 1140.

159. *See id.* at 1140-41.

160. *Deepsea Ventures Inc., Notice of Discovery and Claim of Exclusive Mining Rights, and Request for Diplomatic Protection of Investment*, in 5 NEW DIRECTIONS IN THE LAW OF THE SEA 376, 378 (1977) (letter of Nov. 14, 1974, from Deepsea Ventures Inc. to the U.S. Secretary of State).

161. *Id.*

Area, many sites rich in manganese nodules are also found in the economic zones of many countries. Mining in these zones would be subject to the national jurisdiction of the individual country, and mining companies would rather deal with national governments when mining in economic zones than with the ISA.¹⁶²

Despite the LOS Convention, the United States has maintained the position that deep seabed mining is a freedom of the high seas. The most frequently cited support for this position is the 1958 Geneva Convention on the High Seas (High Seas Convention),¹⁶³ especially article 2, and the Commentaries to article 2.¹⁶⁴ Although not specifically listed in article 2 as a freedom of the seas, it is argued that deepsea mining should be included because the list is specifically stated to be nonexclusive.¹⁶⁵ The first Commentary stated that the High Seas Convention, article 2, included the freedom to explore and exploit the subsoil of the high seas. The second Commentary, however, recognized the uncertainty involved with the seabed, stating that exploitation of the subsoil of the high seas "had not yet assumed sufficient practical importance to justify special regulation."¹⁶⁶ Accordingly, the interpretation that deep seabed mining is a freedom of the high seas is only one interpretation of the Commentaries and, more importantly, there is no evidence that the Commentaries reflect customary international law.¹⁶⁷

In 1980, the United States enacted the Seabed Resources Act.¹⁶⁸ This legislation was prompted, in part, by the fact that the U.S. Congress wanted to encourage completion of the Law of the Sea treaty. The Seabed Resources Act was also to provide an interim program for deepsea exploration and exploitation of hard minerals. The Act included as two of its goals the protection of the environment and the promotion of safety.¹⁶⁹ During the eighth session of

162. Borgese, *The Role of the International Seabed Authority in the 1980's*, 18 SAN DIEGO L. REV. 395, 400 (1981).

163. Done Apr. 29, 1958, 13 U.S.T. 2312, T.I.A.S. No. 5200, 450 U.N.T.S. 82 (entered into force Sept. 30, 1962) [hereinafter cited as High Seas Convention].

164. Van Dyke & Yuen, "*Common Heritage*" v. "*Freedom Of The High Seas*": *Which Governs The Seabed?*, 19 SAN DIEGO L. REV. 493, 501 (1982) [hereinafter cited as Van Dyke & Yuen]; see High Seas Convention, *supra* note 163, art. 2.

165. Van Dyke & Yuen, *supra* note 164, at 502.

166. Report of the International Law Commission to the General Assembly, 11 GAOR Supp. (No. 9) at 24, U.N. Doc. A/3159 (1956); reprinted in [1956] 2 Y.B. INT'L L. COMM'N 253, U.N. Doc. No. A/CN.4/SER.A/1956/Add. 1.

167. Van Dyke & Yuen, *supra* note 164, at 504.

168. 26 U.S.C. §§ 4495-4498 and 30 U.S.C. §§ 1401-1473 (1982); see *supra* note 31 and accompanying text.

169. 30 U.S.C. § 1401(b)(4) (1982).

UNCLOS III the legality of unilateral mining legislation typified by the U.S. Seabed Resources Act was challenged by representatives of the developing countries, called the Group of 77.¹⁷⁰ The Group of 77 also argued, as one commentator put it, that national legislation “would violate the rule of good faith in negotiations and have an impact beyond the sphere of the conference on economic cooperation between developing and developed countries.”¹⁷¹ The U.S. position was that national legislation was consistent with existing international law and that this legislation was compatible, in this commentator’s paraphrase, with the U.S. “commitment to the conclusion at the earliest possible time of a generally acceptable law of the sea convention.”¹⁷² The Seabed Resources Act achieved strong support from industry and the Carter Administration. While the Seabed Resources Act was enacted by Congress with little industry or congressional opposition,¹⁷³ the international objections were vehement and widespread. With regard to their mineral resources, the developing nations feared that, as they had been overly exploited during their colonial period, the deep seabed would be similarly “colonized.”¹⁷⁴

The dispute between the developed nations and the developing nations concerning the International Sea-bed Authority (ISA) is an ideological debate. A system of taxing activities in the Area could have been devised which would have satisfied the developing nations and which still would have allowed an adequate return on investment for the developed states and their nationals. The developing countries, however, wanted a self-reliant ISA, which through its Enterprise could not only engage in its own mining, but also exercise control over the activities of other mining in the Area.¹⁷⁵ The developed nations wanted an ISA with limited and well-defined powers. Such an ISA would be utilized as an administrative organization—awarding licenses, settling disputes, and collecting taxes.¹⁷⁶ This debate over the basic role of the ISA was

170. Oxman, *The Third United Nations Conference on the Law of the Sea: The Eighth Session (1979)*, 74 AM. J. INT’L L. 1, 8 (1980).

171. *Id.*

172. *Id.*

173. Collins, *Deep Seabed Hard Mineral Resources Act—Matrix for United States Deep Seabed Mining*, 13 NAT. RESOURCES LAW. 571, 574 (1981).

174. *Cf.* Goldberg, *The State of the Negotiations on the Law of the Sea*, 31 HASTINGS L.J. 1091, 1095 (1980).

175. Comment, *UNCLOS III: The Remaining Obstacles to Consensus on the Deepsea Mining Regime*, 16 TEX. INT’L L.J. 79, 108-09 (1981).

176. *Id.*

never adequately resolved, and this dispute became the most important factor in the U.S. rejection of the LOS Convention.

The early U.N. tests adopted on the subject of deep seabed mining should also be mentioned. The Informal Single Negotiating Text (SNT),¹⁷⁷ formulated in 1975, was largely a revision of the 1970 U.S. Draft Treaty.¹⁷⁸ The SNT retained the concept of an Authority that would have absolute control over deep seabed mining.¹⁷⁹ The SNT also called for revenue-sharing, and by virtue of its one-member, one-vote provision, granted control over the ISA to the Third World nations.¹⁸⁰ "Supplementing the Draft Treaty, however, the SNT also established an 'Enterprise' to mine the deep seabed on behalf of the Authority and authorized the transfer of technology from industrialized nations to third world countries."¹⁸¹ The subsequent texts increased the burdens imposed upon the developed countries.

During the fifth session of UNCLOS III, the United States, the USSR, and the Group of 77 each submitted proposals for exploitation of the Area. Under the Group of 77's "unitary proposal" the ISA was given a preeminent role in exploitation decisions. Mining was to be conducted directly by the Enterprise and by joint ventures between the Enterprise and outsiders (countries or corporations). The ISA was given full control over all seabed mining activities.¹⁸²

The Soviet plan called for exploitation both by the ISA and by those countries which were parties to the treaty. A country could engage in mining activities directly or through corporations registered in and sponsored by that country. The right of all countries to mine the seabed was guaranteed and not subject to the discretion of the ISA.¹⁸³

The U.S. proposal envisioned a system of "parallel" authorities that placed the ISA, the individual countries, and the corporations on an equal footing in mining the seabed. The ISA was given the

177. U.N. Doc. A/CONF.62/WP.8/Parts I, II, III, 4 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 137 (1975), U.N. Sales No. E.75.V.10; U.N. Doc. A/CONF.62/WP.9/Part IV, 5 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 111 (1976), U.N. Sales No. E.76.V.8.

178. Pietrowski, *supra* note 54, at 58.

179. *Id.*

180. *Id.*

181. *Id.* (footnotes omitted) *See also* Frank, *supra* note 13, at 820-24 (a discussion of the deficiencies in the environmental protection provided by the SNT).

182. Evriviades, *The Third World's Approach to the Deep Seabed*, 11 OCEAN DEV. & INT'L L.J. 201, 216 (1982) [hereinafter cited as Evriviades].

183. *Id.* at 217.

fiscal and administrative control over activities in the Area, subject to limitations safeguarding the rights of countries and corporations.¹⁸⁴

Ostensibly, the Informal Composite Negotiating Text/Revision 2 (ICNT/Rev.2)¹⁸⁵ was the negotiating text which represented the turning point in the negotiations in Committee I of UNCLOS III. When the unofficial Evensen Text, written during the 1977 session before ICNT/Rev. 2, was submitted to the chairman of Committee I, he revised it without consulting either Committee I or even a representative subgroup.¹⁸⁶ The result was the Informal Composite Negotiating Text (ICNT).¹⁸⁷ The United States and other developed countries maintained, as one commentator has characterized the position, that the ICNT was a "drastic departure from the compromises reached in the Working Group unduly favoring the position of the radicals in the Group of 77."¹⁸⁸ While many countries were victimized by the committee chairman's action, U.S. diplomatic problems were exacerbated by the failure of the Carter Administration to honor the concessions negotiated by the Ford Administration. Eventually, the controversial provisions were retained in the Informal Composite Negotiating Text/Revision 1 (ICNT/Rev.1),¹⁸⁹ as well as in the ICNT/Rev.2 and subsequent negotiating texts. The United States made it clear that the ICNT concepts of deep seabed mining were an unacceptable system of regulation, but the U.S. objections did not persuade the majority of countries participating in UNCLOS III to reject the ICNT.

Examination of the negotiating texts and the final text reveals that after the ICNT/Rev.2 certain concepts were ingrained in the provisions and that the basic deep seabed regime proposal remained

184. *Id.* at 217-218.

185. U.N. Doc. A/CONF.62/WP/Rev.2 (1980) [hereinafter cited as ICNT/Rev.2].

186. Charney, *United States Interests In A Convention On The Law Of The Sea*, 11 VAND. J. TRANSNAT'L L. 39, 57 (1983) [hereinafter cited as Charney].

187. U.N. Doc. A/CONF.62/WP.10, 8 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 1 (1977), U.N. Sales No. E.78.V.4 [hereinafter cited as ICNT]. For a discussion of the ICNT, see Oxman, *The Third United Nations Conference on the Law of the Sea: The 1977 New York Session*, 72 AM. J. INT'L L. 57 (1978).

188. Charney, *supra* note 186 at 57; see ICNT, *supra* note 187, arts. 133-92. See generally Oxman, *The Law of the Sea Conference and Development: Food and Energy Resources*, 13 LAW. AM. 167 (1981). The deep seabed mining negotiations produced sharp divisions between the industrialized and the developing countries despite the fact that deep seabed mining will have little impact on the development of the developing countries before the end of the twentieth century. *Id.* at 167.

189. U.N. Doc. A/CONF.62/WP.10/Rev.1 (1979) [hereinafter cited as ICNT/Rev.1].

relatively unchanged from session to session. There seemed to be agreement that an ISA would control all deep seabed mining. The ISA was to consist of an Assembly, a Council and commissions, a Secretariat, and an Enterprise.¹⁹⁰ Exploitation would be conducted under the American "parallel system," involving both public and private developers.¹⁹¹ Protection of the marine environment from harmful effects of development was to be within the rule-making authority of a Legal and Technical Commission.¹⁹²

The Assembly was granted the authority to establish general policies beyond those specified in the LOS Convention itself. The Council was supposed to work with the Legal and Technical Commission to develop specific policies for governing exploration and exploitation activities and for protecting the marine environment. While there were several provisions involving the Legal and Technical Commission that charged the Commission with achieving the environmental goals they were weak and should have been strengthened.¹⁹³

The seabed mining provisions found in the final LOS Convention emphasize resource development and deemphasize the essential balance between development and environmental protection. More importantly, the industrialized countries are not provided with the representation that is commensurate with their international influence and with their capital investments in the seabed mining industry. Since the developing countries have traditionally evinced a reckless disregard for the environment,¹⁹⁴ an ISA dominated by Third World countries can be expected to perpetuate a *de facto* un-

190. Revised Single Negotiating Text, U.N. Doc. A/CONF.62/WP.8/Rev.1/ Parts I, II, III, 5 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 125 (1976), U.N. Sales No. E.76.V.8 [hereinafter cited as RSNT]; U.N. Doc. A/CONF.62/WP.9/Rev.2/Part IV, 6 OFFICIAL RECORDS OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 144 (1977), U.N. Sales No. E.77.V.2; see ICNT, *supra* note 187, arts. 154-86; ICNT/Rev.2, *supra* note 185, arts. 156-85; Draft Convention on the Law of the Sea (Informal Text), U.N. Doc. A/CONF.62/WP.10/Rev.3, arts. 156-85 (1980) [hereinafter cited as DC(IT)]; Draft Convention on the Law of the Sea, U.N. Doc. A/CONF.62/L.78, arts. 156-85 (1981) [hereinafter cited as Draft LOS Convention]; LOS Convention, *supra* note 1, arts. 156-85.

191. See RSNT, *supra* note 190, art. 22(1), Annex I; ICNT, *supra* note 187, art. 151(2)(ii), Annex II; ICNT/Rev.2, *supra* note 185, art. 153(2)(b), Annex III; DC(IT), *supra* note 190, art. 153(2)(b), Annex III; Draft LOS Convention, *supra* note 190, art. 153(2)(b), Annex III; LOS Convention, *supra* note 1, art. 153(2)(b), Annex III.

192. RSNT, *supra* note 190, art. 31; ICNT, *supra* note 187, art. 163, ICNT/Rev.2, *supra* note 185, art. 165; DC(IT), *supra* note 190, art. 165; Draft LOS Convention, *supra* note 190, art. 165; LOS Convention, *supra* note 1, art. 165.

193. See LOS Convention, *supra* note 1, art. 165, paras. 2(d)-(f), 2(h), & 2(k)-(m).

194. See Note, *Providing For Environmental Safeguards In The Development Loans*

concern for the marine environment regardless of the *de jure* concern expressed in the LOS Convention. The Enterprise is designed to mine the seabed on behalf of the ISA and the proceeds from mining and licensing are to be distributed throughout the international community on an "equitable basis"—"taking into particular consideration the interests and needs of developing States and [of] peoples who have not attained full independence or other self-governing status."¹⁹⁵

After all the revisions of the ICNT, those areas of concern which still required substantial negotiation included: (1) the representative governance of the ISA, that is, the Council's jurisdiction, composition, and method of voting; (2) the method of exploiting the deep seabed; and (3) the resource policy of the ISA.¹⁹⁶ These areas of concern were not satisfactorily resolved in the eventual LOS Convention.

One commentator has noted why the first question is important, in his view, to the interests of the United States. "To the extent that the Assembly could dictate to the Council, the political control would rest in the one-nation, one-vote Assembly which would be dominated by the Group of 77."¹⁹⁷ If the Council was designed in a similar way or if it adopted a one-nation, one-vote system, the ISA would be balanced against the industrialized countries.

As finalized in the LOS Convention, the Assembly "shall be considered the supreme organ of the Authority to which the other principal organs shall be accountable as specifically provided for in this Convention."¹⁹⁸ The Assembly has the power to establish general policies "on any question or matter within the competence of the Authority."¹⁹⁹ In accordance with Article 161, the Assembly also elects the members of the Council.²⁰⁰

The Council serves as the executive organ of the ISA, and it establishes the specific policies of the ISA in conformity with the LOS

Given By The World Bank Group To Developing Countries, 5 GA. J. INT'L & COMP. L. 540, 544-47 (1975).

195. LOS Convention, *supra* note 1, art. 140, para. 1. Compare LOS Convention, *supra* note 1, art. 140, para 1, with *id.* art. 160, para. (2)(f)(i). Paragraph (2)(f)(i) is different by only one word.

196. Charney, *supra* note 186, at 59.

197. *Id.* at 60; see Oxman, *The Third United Nations Conference On The Law Of The Sea: The Tenth Session (1981)*, 76 AM. J. INT'L L. 1, 10 (1982) [hereinafter cited as *Tenth Session*] (some U.S. concern after Draft LOS Convention).

198. LOS Convention, *supra* note 1, art. 160, para. 1.

199. *Id.*

200. *Id.* art. 160, para. 2(a).

Convention and with the general policies of the Assembly.²⁰¹ The Council is to consist of thirty-six members elected by the Assembly in the following order: (1) four members selected from those countries which consume or import more than two percent of the minerals to be derived from the Area, with one of the countries being the largest consumer and one of the four being an eastern European nation; (2) four members chosen from the eight nations who possess extensive investments in seabed mining, with at least one country being from eastern Europe; (3) four members selected from the major mineral exporting countries, including at least two developing countries; (4) six members selected from the developing countries; and (5) eighteen members elected according to equitable principles of geographical distribution.²⁰²

The second area of concern remaining after all revisions was the method of exploiting all three of the ICNT texts perpetuated the "parallel system" of exploitation which was incorporated in the subsequent negotiating texts and in the final LOS Convention. However, the ICNT texts differed on the rights of countries and private companies to mine the deep seabed. Under the parallel system, any private enterprise seeking to mine the seabed must identify two equally exploitable sites. The ISA has the option of picking which of the two the ISA wishes to retain for itself, and then the ISA permits the mining consortium to exploit the other site. The ISA thereby incurs no exploration costs and ensures that the mining consortium is not deceiving the ISA or the Third World countries.²⁰³ The ICNT/Rev.2 also gave the ISA extensive powers to regulate and even to deny access to particular countries and private consortia.²⁰⁴ By comparison, the activities of the Enterprise were not similarly restricted. In addition, the ICNT/Rev.2 required the transfer of mining technology from the industrialized countries to the Enterprise.²⁰⁵ The Enterprise thus would have a substantial competitive advantage over the private enterprises trying to mine the seabed. Moreover, the ICNT/Rev.2 dispute settlement procedures did not provide for review of problems arising out of this parallel system.

The Draft Convention on the Law of the Sea (Informal Text)

201. *Id.* art. 162.

202. *Id.* art. 161, para 1.

203. Pietrowski, *supra* note 54, at 64-65.

204. ICNT/Rev.2, *supra* note 185, art. 157.

205. *Id.* Annex III, art. 5.

[DC(IT)],²⁰⁶ the Draft Convention on the Law of the Sea (Draft LOS Convention),²⁰⁷ and the LOS Convention retained the parallel system of exploitation. While the parallel system per se was acceptable, the texts after the ICNT/Rev.2 were not amenable to renegotiation regarding those areas which continued to give the ISA extensive powers to regulate or deny access.²⁰⁸ In addition, these texts continued to mandate the transfer of mining technology from the industrialized countries to the Enterprise, a concept which the developed nations found to be particularly offensive.²⁰⁹

The third remaining policy issue is the quantity of minerals to be mined from the deep seabed. The ICNT would have limited production of nickel from the seabed to the cumulative growth segment of the world nickel market for the first seven years of mining.²¹⁰

At first, these limits were basically retained in subsequent negotiating texts, but the DC(IT), the Draft LOS Convention, and the LOS Convention incorporated a different production limit formula. The LOS Convention, like the DC(IT) and the Draft LOS Convention, provided that an interim period should begin five years prior to January 1 of the year in which the earliest commercial production was to begin, and moreover, this period was to last 25 years, or until the end of the Review Conference provided for in article 155, or until new agreements entered into force.²¹¹ The Review Conference was to convene fifteen years after January 1 of the year in which commercial production began. The Review Conference was to evaluate all aspects of commercial production and to make any changes needed to ensure that the goals and principles of the LOS Convention were upheld.²¹²

The production ceiling for any year of the interim period was designated as the sum of: (1) "the difference between the trend line values for nickel consumption, . . . for the year immediately prior to the year of the earliest commercial production and the year immediately prior to the commencement of the interim period;"²¹³

206. U.N. Doc. A/CONF.62/WP.10/Rev.3 (1980).

207. U.N. Doc. A/CONF.62/L.78 (1981).

208. DC(IT), *supra* note 190, art. 157; Draft LOS Convention, *supra* note 190, art. 157; LOS Convention, *supra* note 1, art. 157.

209. DC(IT), *supra* note 190, Annex III, art. 5; Draft LOS Convention, *supra* note 190, Annex III, art. 5; LOS Convention, *supra* note 1, Annex III, art. 5.

210. ICNT, *supra* note 187, art. 150, para. 1(g)(B)(i).

211. DC(IT), *supra* note 190, art. 151, para. 2(a); Draft LOS Convention, *supra* note 190, art. 151, para. 2(a); LOS Convention, *supra* note 1, art. 151, para. 3.

212. DC(IT), *supra* note 190, art. 155; Draft LOS Convention, *supra* note 190, art. 155; LOS Convention, *supra* note 1, art. 155.

213. LOS Convention, *supra* note 1, art. 151, para. 4(a)(i); *see* DC(IT), *supra* note

and (2) "sixty per cent of the difference between the trend line values for nickel consumption, . . . for the year for which the production authorization is being applied for and the year immediately prior to the year of the earliest commercial production."²¹⁴ The trend line was to be derived from a linear regression of the logarithms of the "actual nickel consumption for the most recent 15-year period . . . time being the independent variable."²¹⁵

By comparison, the various ICNT versions appeared at first to limit only nickel production, but their restrictions effectively limited *de facto* the production of all metals from manganese nodules.²¹⁶ Article 151 of the DC(IT), the Draft LOS Convention, and the LOS Convention specifically limited the production of other metals derived from manganese nodules.²¹⁷ The ICNT's also required compensation for loss of revenue to mineral exporting countries caused by seabed mining²¹⁸—as do the later versions.²¹⁹ The industrialized countries feared that these requirements would restrict deep seabed mining to the point where private companies would view exploration and exploitation as uneconomical.²²⁰ Therefore, under the LOS Convention, the U.S. objective of mineral self-sufficiency would not be realized.

During the tenth session of UNCLOS III in 1981 the United States sought to ensure that the negotiations would not end during that session, pending a policy review by the U.S. government.²²¹ The United States was concerned mainly with provisions in the DC(IT).²²² The U.S. policy review was criticized as a departure from the spirit of "compromise and totality" which had governed

190, art. 151, para. 2(b)(i); Draft LOS Convention, *supra* note 190, art. 151, para. 2(b)(i).

214. LOS Convention, *supra* note 1, art. 151, para. 4(a)(ii); *see* DC(IT), *supra* note 190, art. 151, para. 2(b)(ii); Draft LOS Convention, *supra* note 190, art. 151, para. 2(b)(ii).

215. LOS Convention; *supra* note 1, art. 151, para. 4(b)(i); *see* DC(IT), *supra* note 190, art. 151, para. 2(b)(iii); Draft LOS Convention, *supra* note 190, art. 151, para. 2(b)(iii).

216. Charney, *supra* note 186, at 61.

217. DC(IT), *supra* note 190, art. 151, para. 2(f); Draft LOS Convention, *supra* note 190, art. 151, para. 2(f); LOS Convention, *supra* note 1, art. 151, para. 7.

218. ICNT, *supra* note 187, art. 150, para. 1(g)(D); ICNT/Rev.1, *supra* note 189, art. 151, para. 4; ICNT/Rev.2, *supra* note 185, art. 151, para. 4.

219. DC(IT), *supra* note 190, art. 151, para. 4; Draft LOS Convention, *supra* note 190, art. 151, para. 4; LOS Convention, *supra* note 1, art. 151, para. 10.

220. *See* Charney, *supra* note 186, at 61; *Tenth Session*, *supra* note 197, at 9-10.

221. *Tenth Session*, *supra* note 197, at 2.

222. *Id.* at 9-10.

the conference since its inception.²²³ Ambassador Evensen of Norway predicted that “[i]f one main state or group of states rescind one main element of the package, the whole package would fall apart and the compromise package elaborated with such finesse, perhaps even ingenuity, over the years would collapse like a house of cards.”²²⁴

It was during the tenth session that the newly-elected Reagan Administration voiced its concerns with the seabed mining provisions, but the chairman of the Group of 77 stated that the provisions of the DC(IT) represented the only concessions that were acceptable to the Group of 77.²²⁵ The Draft LOS Convention was produced during this session,²²⁶ and with a few minor changes this text became the final LOS Convention.

In testimony before the U.S. Congress, James Malone, the Special Representative of the President for the Law of the Sea Conference, identified the U.S. concerns regarding the deep seabed provisions. This testimony summarized the long-standing concerns of the United States.

- a. The Draft LOS Convention imposed burdensome international regulation on deep seabed resource development, including both polymetallic nodules and future undiscovered mineral deposits.
- b. The Draft LOS Convention established a supranational mining company (the Enterprise), which had discriminatory advantages relative to private companies. The Enterprise could monopolize production of seabed minerals. In addition, the United States and other countries would have to provide initial funds to the Enterprise in proportion to their U.N. contributions.
- c. The Draft LOS Convention compelled those companies that wanted to mine the seabed to transfer technology to the Enterprise, and privately-owned technology could be demanded by any developing countries planning to mine.
- d. There was a limited annual production of nodules for the first 20 years of production. This production control was to protect land-based mineral producers, but these production limits would discourage investment, and they could also be used to exclude U.S. companies from mining if there were too many mining applicants.

223. *Id.* at 4-5.

224. *Id.* at 4 (quoting a statement supplied to the author by Ambassador Evensen).

225. *Id.* at 12.

226. *Id.* at 19.

- e. The Draft LOS Convention provided that after 15 years of production the exploitation provisions could be changed by a two-thirds vote. If it were to disagree with the changes, the United States would have to renounce the entire treaty or else be bound by the changes.
- f. Revenue-sharing obligations on mining companies would significantly increase seabed mining costs.
- g. The Draft LOS Convention lacked provisions protecting investments made prior to entry into force of the Convention. These provisions were known as "grandfather clauses" or "preparatory investment protection" (PIP) clauses.²²⁷

According to one deepsea mining company, the law of the sea provisions did not provide enough incentive to proceed with commercial mining. Greater assurances of access to the minerals were necessary—given the extremely high costs of initial investment, estimated at a minimum of 1.0 to 1.5 billion dollars.²²⁸

The final LOS Convention addressed U.S. concerns to a limited extent. Some changes were made from the text of the Draft LOS Convention. For example, the United States would have been guaranteed a Council seat, as long as the United States was the "largest consumer" of seabed minerals.²²⁹ Some protections for "pioneer investors" were provided in Resolution II.²³⁰ The two-thirds vote required for the Review Conference to amend the seabed mining provisions was changed to a three-fourths vote requirement.²³¹ The indirect moratorium on the exploitation of seabed minerals other than manganese nodules was ended, and the rules and regulations regarding their exploitation would be adopted within three years of a request by a State party.²³² Production limits as well as other rules and regulations regarding these "other seabed minerals" would be imposed after a consensus was reached by the Council.²³³

However, there were still U.S. objections voiced by the Reagan Administration and the LOS Convention was rejected. (1) The United States and the other developed nations needed a functional position in the administration of the deep seabed that would protect their interests as against the interests of the ISA. (2) The amending

227. *Id.* at 9-10.

228. Dangler, *An Ocean Miner's View of the Draft Convention*, 3 N.Y.L. Sch. J. Int'l & Comp. L. 27, 32 (1981).

229. LOS Convention, *supra* note 1, art. 161, para. 1(a).

230. *Id.* at Resolution II.

231. *Id.* art. 155, para. 4.

232. *Id.* art. 162, para. 2(o)(ii).

233. *Id.* art. 161, para. 8(d).

provisions of the LOS Convention could bind the United States to amendments that it opposed—a concept incompatible with the U.S. treaty doctrine. (3) Technology transfer provisions would injure and deter private U.S. mining interests. (4) There was no guaranteed access for qualified mining companies.²³⁴ In any event, solutions to these problems will have to be found before the United States will become a party to the LOS Convention.

D. Trends and Conditioning Factors

In the near future, scientists will probably not have adequate scientific evidence documenting the full environmental impacts of deep seabed mining. This problem will hamper the trend toward strong international regulation.²³⁵ The main claims which impacted upon the UNCLOS III negotiations were nonenvironmental, but these claims have strongly influenced the environmental issues. The UNCLOS III interests related to fisheries, construction, transportation, and the military effectively dominated environmental policy.²³⁶ A degree of fear by these industries regarding environmental regulations affected the plans for the ISA's protective power over the environment of the deep seabed.²³⁷ In any event, the International Maritime Organization (IMO), the successor organization to the Intergovernmental Maritime and Consultative Organization (IMCO), would be a better environmental regulator for this area.

Despite the lack of progress at the early UNCLOS III negotiations in protecting the marine environment from the negative effects of deep seabed mining, there were a number of advocates of increasing the environmental powers granted to the ISA under the LOS Convention.²³⁸ One proposal would have obligated the ISA to institute the "setting up of binding standards to control pollution from exploration and exploitation of the marine resources of the seabed and the water column beyond the limits of national jurisdiction"²³⁹ These controls could have included: (1) the setting of pollution standards; (2) the granting of licenses only after evidence of a demonstrated ability and desire to comply with environmental standards; (3) the monitoring of results; and (4) the setting of penal-

234. K. SIMMONDS, U.N. CONVENTION ON THE LAW OF THE SEA 1982 xvii-xviii (1983) [hereinafter cited as SIMMONDS].

235. Nyhart, *supra* note 95, at 858-59.

236. *Id.* at 859.

237. *Id.*

238. *Id.* at 860; see LOS Convention, *supra* note 1, arts. 145, 147, 162, 165.

239. U.N. Doc. A/CONF.62/C.3/L.2, art. 8 (1974).

ties for governments—and companies and nationals under their jurisdiction.²⁴⁰ However, article 145 of the LOS Convention, which governs the protection of the marine environment, is basically a “generalized policy statement.”²⁴¹ Such generality has been an historical characteristic of negotiations on international environmental problems.²⁴²

There are two trends in negotiated international agreements on deep seabed mining. One trend is the recognition that in the foreseeable future, only a few nations will possess a sufficient capital base and the necessary technology to conduct deep seabed mining. It has been suggested that there is therefore no immediate need for a regime of law that is recognized by all nations.²⁴³ Accordingly, the United States should enter into bilateral or limited multilateral agreements to establish environmental practices to be enforced during the operation of mining projects.²⁴⁴ International environmental law would be expedited, and future negotiations would be less likely to become encumbered by the kinds of extraneous issues that plagued the UNCLOS III negotiations.²⁴⁵ Bilateral or limited multilateral negotiations would focus public attention on the proceedings, and such negotiations might influence the participating countries to be more tractable on environmental questions.²⁴⁶ In addition, such negotiations would probably produce environmental regulations that are site-specific and responsive to peculiar ecological factors. Since the negotiations involve complex economic factors, the United States would usually have a stronger negotiating position in a bilateral situation.²⁴⁷ Experience with NEPA and other federal environmental legislation indicates that environmental reform in the United States has become increasingly costly. The ability of the economy to pay these compliance costs has become a major economic issue.²⁴⁸ Unfortunately, other developed countries have not enacted comparable environmental legislation, and the inequalities of environmental protection costs have produced trade distortions. Consequently, in bilateral or limited multilateral negotiations concerning deep seabed mining regulations, “if a na-

240. Nyhart, *supra* note 95, at 860.

241. See Whitney, *supra* note 1, at 92; LOS Convention, *supra* note 1, art. 145.

242. Whitney, *supra* note 1, at 92-93.

243. *Id.* at 94.

244. *Id.* at 95.

245. *Id.*

246. *Id.*

247. *Id.*

248. *Id.*

tion rejects the adoption of a rule or practice that the United States regards as essential to environmental protection and if that refusal produces unequal operational costs that result in a trade distortion, . . . [then the U.S. negotiators could] indicate that import relief against the advantaged foreign product . . . [would] be imposed."²⁴⁹ As mentioned earlier, under the terms of the Seabed Resources Act, the Administrator of NOAA may designate other nations as reciprocating States for deepsea mining purposes if, *inter alia*, those nations provide adequately for the protection of the environment when they mine.²⁵⁰

The United States enacted the Deep Seabed Hard Mineral Resources Act in June of 1980.²⁵¹ The Federal Republic of Germany (FRG) followed with its own legislation in August of 1980, which provided for the licensing of FRG nationals to explore and exploit the deep seabed.²⁵² In 1981, the United Kingdom²⁵³ and France²⁵⁴ also put into effect unilateral licensing acts to allow their nationals to enter the race for the deep seabed.

The Seabed Resources Act,²⁵⁵ like the FRG,²⁵⁶ British,²⁵⁷ and French²⁵⁸ legislation, provides for reciprocity, that is, the recognition of licenses and claims of other countries if those other countries recognize U.S. licenses and adopt legislation similar to the U.S. legislation.²⁵⁹ The U.S.,²⁶⁰ FRG²⁶¹ and British²⁶² legislation provide that the executive will determine if another country qualifies as a

249. *Id.* at 97.

250. 30 U.S.C. § 1428(a) (1982); *see supra* note 99 and accompanying text.

251. *See supra* note 31 and accompanying text.

252. Law of Aug. 16, 1980 (zur vorläufigen Regelung des Tiefseebergbaus), 1980 Bundesgesetzblatt, Teil I (1980 BGB1), Aug. 22, 1980, at 1457; *see* English translation, Federal Republic of Germany: Act of Interim Regulation of Deep Seabed Mining, 20 I.L.M. 393 (1981).

253. Deep Sea Mining (Temporary Provisions) Act 1981, ch. 53, *reprinted in* 20 I.L.M. 1217 (1981) [hereinafter cited as Mining Act 1981].

254. LAw of Dec. 23, 1981 (sur l'exploration et l'exploitation des ressources minérales des grands fonds marins), 1981 Journal Officiel de la République Française (1981 J.O.), Dec. 24, 1981, at 3499; 1982 Dalloz-Sirey, *Législation* (1982 D.S.L.) 11; *see* English translation, France: Law on the Exploration and Exploitation of Mineral Resources of the Deep Seabed, 21 I.L.M. 808 (1982).

255. 30 U.S.C. § 1428 (1980).

256. 1980 BGB1 at 1459, § 14.

257. Mining Act 1981, *supra* note 253, at § 3.

258. 1981 J.O. at 3500, art. 13; 1982 D.S.L. at 12, art. 13.

259. 30 U.S.C. § 1428 (1982).

260. 30 U.S.C. § 1428(a) (1982).

261. 1980 BGB1 at 1459, § 14.

262. Mining Act 1981, *supra* note 253, at § 3(1).

reciprocating State, while the French Act²⁶³ calls for recognition by international agreement.

The British legislation also deals with measures by another country that restrict the use of ships registered in the United Kingdom. In such a situation, the Secretary of State may similarly prohibit the use of ships from that country in British mining operations.²⁶⁴ This section would affect the United States which requires that U.S. registered ships be used for mining and processing, and that at least one U.S. ship be used in transporting the minerals from each mining site.²⁶⁵ France would also be affected because its legislation requires the use of French ships and aircraft between the territory of France and the mining equipment at the deep seabed sites.²⁶⁶

These legislative acts confirmed a trend toward unilateral deep seabed mining initiatives which challenged the objectives of UNCLOS III.²⁶⁷ Then, on September 2, 1982, the FRG, France, the United Kingdom and the United States entered into an "Agreement Concerning Interim Arrangements Relating to Polymetallic Nodules of the Deep Sea Bed."²⁶⁸ This agreement provides procedures and principles for resolution of disputes over deepsea mining activities.

The position of the Third World countries was that this unilateral legislation by the United States and the other developed nations, and the agreement among these nations, were "illegal as violations of the principle of the common heritage of mankind."²⁶⁹ Furthermore, it was argued that there would be nothing to prevent countries that were not parties to the agreement from mining the high seas in disregard of both the agreement and the unilateral legislation of other nations.²⁷⁰

A proposed alternative to regulating the deep seabed by bilateral treaties and multilateral agreements was to proceed unilaterally under existing freedom of the sea doctrines.²⁷¹ For practical reasons, however, domestic legislation was necessary to provide some

263. 1981 J.O. at 3500, art. 13; 1982 D.S.L. at 12, art. 13.

264. Mining Act 1981, *supra* note 253, at § 8.

265. 30 U.S.C. § 1412(c)(2)-(3) (1982).

266. 1981 J.O. at 3500, art. 10; 1982 D.S.L. at 12, art. 10.

267. 23 HARV. INT'L L.J., 155, 155 (1982).

268. Done Sept. 2, 1982, T.I.A.S. No. 10562, reprinted in *Simmonds*, *supra* note 234, at xxxi.

269. Djalal, *Law of the Sea Conference: Other Alternatives For Seabed Mining?* 3 N.Y.L. SCH. J. INT'L & COMP. L. 39, 48 (1981).

270. *Id.* at 47-48.

271. Pietrowski, *supra* note 54, at 71-72.

stability of investment for U.S. companies.²⁷² The Seabed Resources Act satisfies these requirements and provides a regime for U.S. mining of the deep seabed until an alternate international regime is established.²⁷³

As evidence of the trend toward a mini-treaty solution to the UNCLOS III dilemma, the Seabed Resources Act was directed at providing a climate of legal certainty so that the development of deep seabed mining would not be further inhibited.²⁷⁴ However, it was not intended to exclude international agreements. Its enactment was founded on the strategic importance of the minerals and their potential contribution to eliminating the growing U.S. trade deficit.²⁷⁵

If the marine environment is ignored during this early developmental stage, it may later become necessary for industry to alter its equipment to comply with future environmental legislation.²⁷⁶ To accommodate this need, the executive branch must assess environmental impact through programmatic environmental impact statements.²⁷⁷ It should also be remembered that issuance of a license for seabed mining constitutes a "major Federal action" under NEPA and requires an EIS particularized to the proposed operation.²⁷⁸ As mentioned earlier, the Seabed Resources Act requires the use of the best available technologies for protection of the environment for all activities under new permits, and, wherever practicable, under existing permits, unless the benefits of using such technologies are clearly insufficient to justify the costs.²⁷⁹

It was suggested, contrary to assertions by the U.S. State Department under President Carter, that the U.S. negotiators would gain bargaining power through unilateral legislation such as the Seabed Resources Act. It was also predicted that the Third World nations would be forced to recognize the economic requirements of the United States and other industrialized countries participating in the UNCLOS III negotiations.²⁸⁰ This suggestion was tempered by the proposal that any domestic U.S. legislation should facilitate compatibility with any multilateral or bilateral regime to which the

272. *Id.* at 72.

273. 30 U.S.C. §§ 1441-42 (1982).

274. *See id.* §§ 1443-44; *New Combination*, *supra* note 16, at 952.

275. *See* 30 U.S.C. § 1401 (1982); *New Combination*, *supra* note 16, at 952.

276. *See New Combination*, *supra* note 16, at 952.

277. *See* 30 U.S.C. § 1419 (1982).

278. 30 U.S.C. § 1419(d) (1982); 42 U.S.C. § 4332(2)(c) (1982).

279. 30 U.S.C. § 1419(b) (1982).

280. Pietrowski, *supra* note 54, at 74.

United States subsequently acceded.²⁸¹ Such a provision was allegedly designed to forewarn the developing countries that the United States would only adopt a reasonable international treaty to implement its ocean policy.²⁸² It was within this context and pursuant to this rationale that the Seabed Resources Act was enacted in 1980.²⁸³

E. Policy Alternatives and Recommendations

While UNCLOS III was in session, it was postulated that should the UNCLOS III negotiations fail, Congress (if the State Department agreed) could and should enact a legislative program providing the necessary economic assurances while adhering to sound regulatory and environmental principles.²⁸⁴ Prior to enactment of the Seabed Resources Act, other legislation was introduced in both the House and the Senate to encourage the development of deep seabed resources.²⁸⁵ The most notable were the Murphy bill²⁸⁶ and the Fraser bill.²⁸⁷ Since these bills formed the basis of the Seabed Resources Act of 1980, a review of their provisions is helpful.

The Murphy bill established a licensing and regulatory system for the U.S. seabed mining industry, subjected these mining activities to other federal legislation, and provided stability of investment.²⁸⁸ The Murphy bill provided that the issuance of a license to mine the ocean specifically constituted a "major Federal action" under the provisions of NEPA. This provision was added to assure environmentalists that an EIS would be "required for each license, rather than merely a programmatic impact statement for licensing in general."²⁸⁹ This bill also provided that the Secretary of Commerce had to consult with the Administrator of the Environmental Protection Agency (EPA) before establishing environmental criteria and promulgating regulations. However, environmental groups considered this language inadequate and asserted that the EPA should be granted total responsibility for environmental protection.²⁹⁰

281. *Id.*

282. *Id.*

283. *See* 30 U.S.C. §§ 1401, 1441-42 (1982).

284. Whitney, *supra* note 1, at 97.

285. Frank, *supra* note 13, at 824.

286. H.R. 3350, 95th Cong., 1st Sess. (1977) ("Deep Seabed Hard Minerals Act").

287. H.R. 3652, 95th Cong., 1st Sess. (1977) [hereinafter cited as Fraser bill]; *see* 123 CONG. REC. 4604 (1977) ("to insure the development of U.S. ocean mining capabilities and to support the continuation of the Law of the Sea negotiations"). The text is not reported.

288. Ott, *supra* note 53, at 597-98.

289. *Id.* at 598-99.

290. *Id.* at 599.

The Seabed Resources Act incorporated all of these considerations except for the investment guarantees.²⁹¹ The EIS requirements for each license and the programmatic EIS requirements of the Murphy bill were included in the Seabed Resources Act. However, as indicated earlier, these provisions lead to duplication that hinders development and provides only marginally enhanced environmental protection.²⁹² Instead of EIS requirements and overlapping programmatic EIS requirements, a substitute program of long-term "fate and effects studies" should be implemented.²⁹³

In any event, the Fraser bill represented a compromise position designed to be acceptable to those opposed to the more extreme legislative proposals.²⁹⁴ It stressed the common interest in exploiting the deep seabed under the auspices of an international treaty produced by the UNCLOS III negotiations, rather than emphasizing strictly national interests. Thus, the Fraser bill established a "transitional" process that would not threaten UNCLOS III.²⁹⁵ It called for the Administrator of NOAA to accelerate the program of environmental assessment of deep seabed mining.²⁹⁶ The Fraser bill articulated the important principle that the absence of a legal regime constituted "an impediment to deep seabed mining progress by creating investment uncertainty."²⁹⁷ In order to create incentive, an effective regulatory scheme providing investment security was deemed necessary.²⁹⁸

After the enactment of the Seabed Resources Act, the treaty alternatives involving deep seabed mining included: (1) compromise; (2) no treaty; (3) a treaty without the United States; (4) a treaty without substantive articles with regard to deep seabed mining; or (5) a limited agreement.²⁹⁹ The fight to control the technology of

291. See 30 U.S.C. §§ 1419, 1443-44 (1982).

292. See *supra* footnotes 138-41 *supra* and accompanying text.

293. *Id.*

294. Ott, *supra* note 53, at 602.

295. Whitney, *supra* note 1, at 83-84.

296. *Id.* at 87.

297. Fraser bill, *supra* note 287, at § 2(a)(3).

298. Whitney, *supra* note 1, at 89.

299. Nyhart, *supra* note 95, at 848. For in-depth analyses of these options, see Alexander, Cameron, & Nixon, *The Costs of Failure at the Third Law of the Sea Conference*, 9 J. MAR. L. & COM. 1 (1977); Bandow, *UNCLOS III: a Flawed Treaty*, 19 SAN DIEGO L. REV. 475 (1982); Buzon, *Negotiating By Consensus: Developments In Technique At The United Nations Conference On The Law Of The Sea*, 75 AM. J. INT'L L. 324 (1981); Charney, *supra* note 186, at 39; D'Amato, *An Alternative to the Law of the Sea Convention*, 77 AM. J. INT'L L. 281 (1983); Finlay, *The Proposed New Convention On The Law Of The Sea—A Candid Appraisal*, 7 SYRACUSE J. INT'L L. & COM 135 (1979); Gamble, *Post World War II Multilateral Treaty-Making: The Task of the Third United Nations*

deep seabed mining was influenced by many nontechnical forces. Pressures were brought by U.S. mining interests on the government to negotiate a treaty which would: (1) maintain the U.S. technological lead; (2) assert the U.S. desire to control and maintain its sources of raw materials; and (3) defend the concerns of the other industrialized and less-developed countries as consumers. These interests almost necessarily conflicted with the evolution of the "new economic order" and the determination of the developing countries to gain *de facto* control over any exploitation of the ocean by creating the ISA.³⁰⁰

The Reagan administration felt that the LOS Convention provisions applying to U.S. seabed mining interests would preclude U.S. ratification of the LOS Convention because those provisions did not accommodate U.S. economic and political interests. An alternative view focused on whether, as a practical matter, a widely acceptable legal regime for the deep seabed could develop given the restrictive regime advanced in the Third World countries in the LOS Convention.³⁰¹

In determining whether the LOS Convention seabed mining provisions are responsive enough to private U.S. interests, the United States should analyze other risky international investment situations. Terrestrial mineral concession agreements between U.S. mining companies and developing countries are closely analogous.³⁰² Private mining companies would be better off dealing with the ISA than with developing countries.³⁰³ Greater predictability, less corruption, better dispute settlement procedures, and less onerous financial and technical contributions would result from dealing with the ISA instead of with a developing country.³⁰⁴

An international effort is needed to protect the marine environment. Broad acceptance and implementation of an LOS treaty is

Law of the Sea Conference in Perspective, 17 SAN DIEGO L. REV. 527 (1980); Gamble, *Where Trends the Law of the Sea?*, 10 OCEAN DEV. & INT'L L.J. 61 (1981); Hazou, *Determining the Extent of Admissibility of Reservations: Some Considerations with Regard to the Third United Nations Conference on the Law of the Sea*, 9 DEN. J. INT'L L. & POL'Y 69 (1980); Hazou, *A Survey of Depositary Functions in Respect of the Caracas Convention on the Law of the Sea*, 12 J. MAR. L. & COM. 485 (1981); Jones, *The International Sea-Bed Authority Without U.S. Participation*, 12 OCEAN DEV. & INT'L L.J. 151 (1983).

300. Nyhart, *supra* note 95, at 848-49.

301. Katz, *A Method for Evaluating the Deep Seabed Mining Provisions of the Law of the Sea Treaty*, 7 YALE J. WORLD PUB. ORD. 114, 115 (1980).

302. *Id.* at 129.

303. *Id.* at 117.

304. *See generally id.* at 116-29.

critical to the protection of the ocean.³⁰⁵ The environmental provisions of the LOS Convention provide substantial improvements over the environmental standards of customary international law.³⁰⁶ Out of 320 LOS Convention articles, forty-eight articles deal specifically with the environment. Although some provisions are rudimentary, minimal standards have been set.³⁰⁷ The LOS Convention would set up a process to settle disputes and provide an international legal order within which laws crucial to the protection of the ocean environment could be developed.³⁰⁸

A few changes to the LOS Convention deepsea mining provisions would be beneficial from an environmental perspective.³⁰⁹ These changes could be appended directly to the text via amendments, or, perhaps more easily, interpretative statements could be added to the conference record regarding those provisions which are ambiguous or unclear.³¹⁰

The concept of marine sanctuaries should be developed.³¹¹ Article 165, paragraph 2(1) requires the Legal and Technical Commission of the Council to make recommendations to set aside areas that could not be mined if "substantial evidence indicates the risk of serious harm to the marine environment."³¹² The purpose of such sanctuaries would be to provide large areas for scientific research on different uses of the ocean.³¹³ Marine areas which are of special significance to scientists or which are highly unique should be designated marine sanctuaries.

Under article 162, paragraph 2(o)(ii), the Council can adopt rules, regulations, and procedures relating to deep seabed prospecting, explorations, and exploitations.³¹⁴ Article 161, paragraph 8(d), requires those questions arising under article 162, paragraph 2, to be decided by consensus.³¹⁵ The LOS Convention should make it "clear that article 162(2)(o)(ii) does not apply to environmental

305. Levering, Barnes, Forkan, Smith, Train, & Yurchyshyn, Memorandum on U.S. Interests and Objectives furthered by the Law of the Sea Treaty, at 14 (July 28, 1981) (copy on file at Center for Oceans Law & Pol'y, U. Va.) [hereinafter cited as LOS Memorandum].

306. *Id.* at 15.

307. *Id.*

308. *Id.* at 16.

309. *Id.*

310. *Id.* at 16-17.

311. *Id.* at 17.

312. LOS Convention, *supra* note 1, art. 165, para. 2(1).

313. LOS Memorandum, *supra* note 305, at 17-18.

314. LOS Convention, *supra* note 1, art. 162, para. 2(o)(ii).

315. *Id.* art. 161, para. 8(d).

rules, and that such rules are therefore not subject to consensus decision-making.”³¹⁶ The LOS Convention should also make it clear that additional environmental restrictions could be placed on existing mining operations when more is learned about the impacts of deep seabed mining on the ocean environment.³¹⁷ Article 161, paragraph 8(c), places a thirty-day time limit on emergency orders issued by a three-fourths Council vote under article 162, paragraph 2(w).³¹⁸ The emergency order may call for suspension or adjustment of mining operations to prevent serious environmental harm.³¹⁹ Extensions on the thirty-day limit must be approved by a consensus of the Council.³²⁰ This provision should be changed so that the thirty-day limit would apply only to orders that suspend operations. Adjustment orders should apply indefinitely.³²¹

The policy debate involving the law of the sea may be more easily viewed by constructing two models that approximate the main opposing arguments. The “pro-treaty” model represents the view taken by former Ambassador Elliot Richardson, the chief United States negotiator at UNCLOS III during the Carter Administration. The “anti-treaty” model represents the opposition.³²²

The pro-treaty model originates in a belief that a treaty is in the overall interest of both the United States and the international community. This viewpoint supports the goals of building international institutions and of making the U.N. system and the world lawmaking process stronger. The LOS Convention is important to maintain navigational freedoms to the U.S. and to ensure American national security. Movement of submarines through important straits and navigational freedoms for oil tankers are guaranteed under the LOS Convention.³²³

This model also assumes that the existing LOS Convention is the best treaty that could be achieved considering the many conflicting interests involved. A tougher negotiating attitude would probably have resulted in the failure of UNCLOS III and in a loss of the

316. LOS Memorandum, *supra* note 305, at 18.

317. *Id.*

318. LOS Convention, *supra* note 1, art. 161, para. 8(c).

319. *Id.* art. 162, para. 2(w).

320. *Id.* art. 161, para. 8(c).

321. LOS Memorandum, *supra* note 305, at 19.

322. Moore, *Charting a New Course in the Law of the Sea Negotiations*, 10 DEN. J. INT'L L. & POL'Y 207, 209-212 (1981) [hereinafter cited as *New Course*]; Moore's Remarks, *supra* note 123, at 107-08.

323. *New Course*, *supra* note 322, at 211.

navigational provisions.³²⁴ The Richardson view would have sought protections for pioneer investors in seabed mining, but would have otherwise accepted the LOS Convention as it was negotiated.³²⁵

The anti-treaty model represents several diverse views that are all opposed to acceptance of the LOS Convention. One view is that an international treaty is unnecessary to protect U.S. interests at sea and that any treaty would only restrict U.S. rights to seabed minerals. This position stresses the importance of deep seabed minerals to the economy and national security. These who hold this view argue that the LOS Convention would not assure the United States access to the seabed minerals. They also believe that the LOS Convention would have no chance of approval in the U.S. Senate.³²⁶

That consent would be necessary in order for the United States to become a party to the LOS Convention. The Senate would probably condition its approval of any LOS treaty on: (1) assured access to seabed minerals; (2) institutional structures consistent with U.S. economic, political, and strategic interests; and (3) the maintenance of free market economic provisions.³²⁷ Thus, no LOS treaty would be approved by the Senate unless the seabed mining provisions of the LOS Convention were altered.³²⁸

Former U.S. Ambassador John Norton Moore has suggested a third alternative, a two-track approach. On one track, the "non-treaty alternative," the United States would seek to coordinate with its allies the position that all provisions of the LOS Convention, except for seabed mining, are customary international law. The United States should coordinate all unilateral deep seabed mining efforts. In addition, the United States must encourage and protect those companies engaged in seabed mining in order to gain negotiating leverage to get a reopening of the LOS Convention.³²⁹

Simultaneous with the first track, the second track would be continued negotiation to change the LOS Convention. The changes should be narrow and should pertain only to changes in the seabed mining text.³³⁰ The United States should remain firm on the ques-

324. *Id.*

325. *Id.*

326. *Id.* at 212-13.

327. Breaux, *The Diminishing Prospects for an Acceptable Law of the Sea Treaty*, 19 VA. J. INT'L L. 257, 257 (1979).

328. *New Course*, *supra* note 322, at 212-13; Moore's Remarks, *supra* note 123, at 112.

329. Moore's Remarks, *supra* note 123, at 115-16.

330. *Id.* at 117.

tion of access to seabed minerals. The LOS Convention must clearly and unambiguously provide U.S. mining firms with assured access to the seabed minerals.³³¹ The LOS Convention must also provide that groups such as the Palestine Liberation Organization will never receive any seabed mining revenues.³³² Those provisions that allow for sweeping changes in the seabed mining provisions on the basis of a conference vote, and which would be binding on all treaty signatories must be eliminated.³³³ The principle of mandatory transfer of technology should also be modified. This modification is especially important if LOS is to gain Senate approval.³³⁴

Amendments to the deep seabed mining provisions of the LOS Convention could be accomplished through the procedures of Article 314—"Amendments to the provisions of this Convention relating exclusively to activities in the Area."³³⁵ Such amendments could be initiated through the ISA. A unanimous vote by the Council³³⁶ and a two-thirds vote in the Assembly would be needed.³³⁷

The United States should maintain its ability to suggest and encourage favorable amendments by working behind the scenes with those nations who are parties to the LOS Convention.³³⁸ By initiating deep seabed mining the United States gains leverage to encourage necessary amendments to the LOS Convention.³³⁹

III.

THE LAW OF THE SEA PROVISIONS

As a minimum, the U.S. negotiators at UNCLOS III were directed to try and obtain a provision which would allow firms engaged in deep seabed mining "to continue operations without significant damage to their investment"³⁴⁰ (commonly referred to as "grandfather rights"). Despite pressure to include a grandfather clause during the ninth session of UNCLOS III in 1980, a "grandfa-

331. *New Course*, *supra* note 322, at 213.

332. *Id.*

333. *Id.* at 214.

334. *Id.* at 215.

335. Moore's Remarks, *supra* note 123, at 117-18; *see* LOS Convention, *supra* note 1, art. 314.

336. LOS Convention, *supra* note 1, art. 161, para. 8(d).

337. *Id.* art. 159, para. 8.

338. Moore's Remarks, *supra* note 123, at 117.

339. *Id.* at 116.

340. S. REP. NO. 96-307, 96th Cong., 1st Sess. 48 (1979).

ther rights" provision was not adopted.³⁴¹ Even so, the Seabed Resources Act contains such a clause.³⁴²

A resolution on Preparatory Investment Protection was finally adopted on April 30, 1982, at UNCLOS III.³⁴³ Pioneer investors who had spent \$30 million prior to January 1, 1983, could qualify for protection.³⁴⁴ The PIP resolution imposed certain obligations on the pioneer investors, but also gave them certain special rights.³⁴⁵ These rights were: (1) pioneer investor registration, "if certified by a signatory to the Convention;" (2) a 150,000 square kilometer pioneer area; and (3) priority in production authorization against any other applicant except the Enterprise.³⁴⁶ This PIP resolution might have been acceptable to the United States if the other seabed mining provisions of the LOS Convention had also been improved. Since those other provisions were altered only slightly, the PIP resolution could not change the U.S. position.³⁴⁷

In any event, the ISA should be limited in its authority over marine pollution from deep seabed mining. As both "developer" and "protector" of the deep seabed, the ISA would be enmeshed in an inherent conflict that would be exacerbated by the trend toward establishing a "new economic order." Article 136 of the LOS Convention states that "[t]he Area and its resources are the common heritage of mankind."³⁴⁸ A *sine qua non* of this concept is the protection of the marine environment as part of that heritage. Furthermore, the ISA would probably regulate in a discriminatory fashion the seabed miners competing with the Enterprise, that is the private and State producers of deepsea minerals.³⁴⁹ In addition, there is the problem of collusion between the ISA and the parties it is to regulate, with resulting higher prices to the consumer.³⁵⁰

Article 139 governs "[r]esponsibility to ensure compliance and liability for damage,"³⁵¹ and it appears that damages arising from

341. See generally U.S. Dep't State, Delegation Report: Ninth Session of the Third United Nations Conference on the Law of the Sea, February 27 - April 4, 1980, New York, at 8-30.

342. 30 U.S.C. § 1441 (1982).

343. Eleventh Session Report, *supra* note 79, at 8.

344. *Id.* at 9.

345. *Id.* at 9-10.

346. *Id.* at 10.

347. *Id.*

348. LOS Convention, *supra* note 1, art. 136.

349. Post, *United Nations Involvement in Ocean Mining*, 10 OCEAN DEV. & INT'L L.J. 275, 292-93 (1982).

350. *Id.* at 293.

351. LOS Convention, *supra* note 1, art. 139.

“breach of contract” are meant; however, the term “damages” is used in a broad manner and conceivably damages could include liability for harming the marine environment. The potential harm from particulate pollution and from ships processing seabed minerals is large.

The marine pollution provisions governing the Area are subordinated to the regular marine pollution provisions in Part XII.³⁵² Article 142, paragraph 3, states that:

3. Neither this Part nor any rights granted or exercised pursuant thereto shall affect the rights of coastal States to take such measures consistent with the relevant provisions of part XII as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline, or related interests from pollution or threat thereof or from other hazardous occurrences resulting from or caused by any activities in the Area.³⁵³

Thus, this general provision appears to defer to the “specific” provisions of Part XII. Since particulate pollution will result from the activities of mining ships and since sludge will be discharged from the processing ships, it is not unreasonable to assert that article 211, regulating “vessel-source pollution” should govern ships engaged in deep seabed mining.³⁵⁴ This interpretation means that the International Maritime Organization (IMO), rather than the ISA, has a great deal of authority in regulating this type of “vessel-source pollution.”

Similar to article 142, the main provision governing “[p]rotection of the marine environment” in the Area, article 145, defers to the provisions of Part XII and provides that “[n]ecessary measures shall be taken in accordance with this Convention.”³⁵⁵ This deference is positioned before those sentences granting some powers to the ISA.³⁵⁶ Accordingly, under a strict interpretation of article 145, the ISA may only regulate pollution in the Area to the extent that the regular marine pollution provisions of Part XII do not. A less-strict interpretation would mandate that the ISA must regulate pollution in the Area in a manner not inconsistent with the other marine pollution provisions of the LOS Convention.

Under article 162, paragraph 2(w), “the Council” may “[i]ssue emergency orders, which may include orders for the suspension or

352. See *id.* arts. 192-237.

353. LOS Convention, *supra* note 1, art. 142, para. 3.

354. *Id.* art. 211.

355. *Id.* art. 145.

356. *Id.*

adjustment of operations, to prevent serious harm to the marine environment arising out of activities in the Area"³⁵⁷ This section is designed for emergencies and is subject to the specific rules of Part XII. For example, if the IMO issued an order under article 211 regulations³⁵⁸ due to a massive vessel-source oil spill in the Area and the Council issued a conflicting order under article 162, paragraph 2(w), the IMO order should take precedence.

Article 162 also authorizes the establishment of "marine sanctuaries" or "wilderness areas" in the oceans under paragraph 2(x), which allows the Council to "[d]isapprove areas for exploitation by contractors or the Enterprise in cases where substantial evidence indicates the risk of serious harm to the marine environment;"³⁵⁹ This paragraph advances a concept important to the marine environment, and marine sanctuaries should be encouraged.

The environmental responsibilities of the Council were delegated to the Legal and Technical Commission under article 165—and notably under paragraphs 2(d), (e), (f), (h), (k), and (l).³⁶⁰ These provisions confirm the interpretation that the trend is to delegate marine pollution regulation to specific sections, and in particular, to Part XII. The main thrust of article 165 appears to be "monitoring"³⁶¹ the marine environment and making "recommendations."³⁶² Paragraph 2(d) supports this conclusion by requiring the functional equivalent of an "international environmental impact statement."³⁶³ The marine pollution provisions in Part XI are thus demonstrably general and advisory in nature. Preference should, therefore, be given to the more specific pollution provisions in Part XII.

The provisions of Part XII itself support this interpretation. In Part XII, article 209, is the general provision governing "Pollution from activities in the Area,"³⁶⁴ while article 215 covers "Enforcement with respect to pollution from activities in the Area."³⁶⁵ These two provisions read as follows:

357. *Id.* art. 162, para. 2(w).

358. *Id.* art. 211.

359. *Id.* art. 162, para. 2(x).

360. *Id.* art. 165, paras. 2(d)-(f), (h), (k), (l).

361. *See, e.g., id.* art. 165, para. 2(h).

362. *Id.* art. 165, para. 2(e)-(m).

363. LOS Convention, *supra* note 1, art. 165, para. 2(d).

364. *Id.* art. 209.

365. *Id.* art. 215.

*Article 209**Pollution from activities in the Area*

1. International rules, regulations and procedures shall be established in accordance with Part XI to prevent, reduce and control pollution of the marine environment from activities in the Area. Such rules, regulations and procedures shall be re-examined from time to time as necessary.

2. Subject to the relevant provisions of this section, States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from activities in the Area undertaken by *vessels, installations, structures and other devices flying their flag or of their registry* or operating under their authority, as the case may be. The requirements of such laws and regulations shall be no less effective than the international rules, regulations and procedures referred to in paragraph 1.³⁶⁶

*Article 215**Enforcement with respect to pollution from activities in the Area*

Enforcement of international rules, regulations and procedures established in accordance with Part XI to prevent, reduce and control pollution of the marine environment from activities in the Area shall be governed by that Part.³⁶⁷

There is nothing in article 209 which would specifically subject vessels mining the deep seabed to the provisions of Part XI, governing the Area. Under article 209, paragraph 1, there is a duty to coordinate the marine pollution provisions of Part XII with development of seabed resources under Part XI.³⁶⁸ Article 209, paragraph 1, provides that “[i]nternational rules, regulations and procedures [under Part XII] shall be established in accordance with Part XI”³⁶⁹ in order “to prevent, reduce and control pollution of the marine environment [governed by Part XII] from activities in the Area.”³⁷⁰ In further support of the interpretation that under article 211, IMO should govern vessel-source pollution from activities in the Area, article 209, paragraph 2 obligates countries “to prevent, reduce and control pollution . . . from activities in the Area undertaken by vessels, installations, structures and other devices flying their flag”³⁷¹ The language of paragraph 2 appears to be establishing a hybrid of “flag-State jurisdiction”—closely related to the concepts historically governing vessel-source pollution. In addition, the requirement in paragraph 2 that national standards “be no

366. *Id.* art. 209 (emphasis added).

367. *Id.* art. 215.

368. *Id.* art. 209, para. 1.

369. *Id.*

370. *Id.*

371. *Id.* art. 209, para. 2.

less effective than the international rules"³⁷² is found in several marine pollution provisions, including those governing vessel-source pollution.³⁷³

Article 215 appears to refute these arguments by providing that enforcement of pollution "from activities in the Area [pursuant to Part XI] shall be governed by that Part."³⁷⁴ As was indicated earlier, however: (1) there are few marine pollution provisions in Part XI; (2) those marine pollution provisions found in Part XI appear to abrogate responsibility to Part XII; and (3) the Part XI provisions are "general" while the Part XII provisions are specific.³⁷⁵ Those who claim that new, specific provisions will be developed for Part XI are incorrect because they misread the LOS Convention and its policies. Accordingly, article 211 and the other vessel-source pollution provisions should be utilized to govern marine pollution from activities in the Area.

Articles 208 and 214 relating to "pollution from seabed activities" also support this interpretation since they grant national jurisdiction over both pollution arising from "sea-bed activities subject to their jurisdiction and pollution from artificial islands, installations and structures under their jurisdiction"³⁷⁶ on the continental shelf or in the economic zone. Since nations will have a type of flag-State jurisdiction over their "vessels, installations, structures and other devices flying their flag"³⁷⁷ while mining the seabed of the Area, articles 208 and 214 appear to be applicable.³⁷⁸ Therefore, articles 209 and 215 relating to marine pollution in the Area have abrogated their authority to other specific provisions of the LOS Convention.³⁷⁹

372. *Id.*

373. *See e.g., id.* arts. 208, 210, 211.

374. LOS Convention, *supra* note 1, art. 215.

375. *See supra* notes 352-58 *supra* and accompanying text.

376. LOS Convention, *supra* note 1, arts. 208, 214.

377. *Id.* art. 209, para. 2.

378. *See id.* arts. 208, 214.

379. *Id.* arts. 209, 215.

APPENDIX I

DEEP SEABED MINING CONSORTIA AS OF 1977

- A. Kennecott Copper Corp.:
 - Rio Tinto Zinc;
 - Mitsubishi Corp.;
 - Consolidated Gold Fields Ltd.;
 - Noranda Mines; and
 - BP Minerals.
- B. Ocean Mining Associates (OMA):
 - U.S. Steel Corp.;
 - Union Miniere (Belgium);
 - Sun Oil Co.; and
 - Other interests including Deepsea Ventures, Inc., which provides engineering and management services.
- C. INCO Consortium:
 - International Nickel Co.;
 - AMR Group (Metallgesellschaft; Preussag, and Salzgitter) (Germany);
 - Deep Ocean Mining Co. (DOMC); a consortium within the consortium comprised of 23 Japanese companies headed by Sumitomo, Nippon Mining, Dowa Mining and others; and
 - Sedco (25 percent).
- D. Lockheed Missile & Space Corp.:
 - Billiton International Metals (Royal Dutch Shell, The Hague);
 - Amoco Minerals Division of Standard Oil of Indiana; and
 - Bos Kalis Westminister Grove, the Netherlands.
- E. French Group (AFERNOD):
 - Centre National Pour l'Exploitation des Oceans (CNEXO);
 - Commissariat l'Energie Atomique (CEA);
 - Society Metallurgique Pour Le Nickel (SMN);
 - France Dunkerque (Empain Schneider Group);
 - Bureau Recherches Geologique et Minieres (BRGM); and
 - Pechiney (expected in 1977 to join).

- F. CLB Group:
CNEXO;
Société Le Nickel (SNL)/SMN;
CEA;
Deepsea Ventures, Inc.;
Dome Exploration;
COMINCO;
Teek Corp.;
International Nickel Co.;
Sumitomo;
AMR;
Atlantic Richfield Corp.;
Occidental Minerals;
Placer Developments;
Utah International;
Superior Oil Corp.;
Broken Hill Pty;
Phelps Dodge;
Furutaka; and
Ocean Resources, Inc.

Source: S. REP. NO. 96-307, 96th Cong., 1st Sess. 74-75 (1979) on S. 493, reproducing a list provided to the Senate Committee on Energy and Natural Resources, the Senate Committee on Commerce, Science and Transportation, and the Senate Committee on Foreign Relations in a November 1977 report of the Department of the Interior.

APPENDIX II

SUMMARY OF MARINE ENVIRONMENTAL CONSEQUENCES

INITIAL CONDITIONS ¹	PHYSICO-CHEMICAL EFFECTS	POTENTIAL BIOLOGICAL IMPACTS (REMAINING CONCERNS IN CAPITALS)	POTENTIAL SIGNIFICANCE OF BIOLOGICAL IMPACT			
			PROBABILITY OF OCCURRENCE	RECOVERY RATE	CONSEQUENCE	OVERALL SIGNIFICANCE
COLLECTOR	* Scour and compact sediments	DESTROY BENTHIC FAUNA IN AND NEAR COLLECTOR TRACK	Certain	Unknown ³ (Probably Slow)	Adverse	Unavoidable* (Uncertain Sig)
	* Light and Sound	Attraction to new food supply, possible temporary blindness	Unlikely	Unknown (Probably Rapid)	Uncertain	None
BENTHIC PLUME	* Increased sedimentation rate and increased suspended matter ("rain of feces")	* EFFECT ON BENTHOS - Covering of food supply	Likely	Unknown ³ (Probably Slow)	Adverse	Unknown ⁴
		- Clogging of respiratory surfaces of filter feeders	Likely	Unknown ³ (Probably Slow)	Adverse	Unknown ⁴
		- Blanketing	Certain	Unknown ³ (Probably Slow)	Adverse	Unknown ⁴
		* Increased food supply for benthos	Unlikely	Rapid ⁴	Possibly Beneficial	None
	* Nutrient/Trace Metal increase	* Trace metals uptake by zooplankton	Unlikely	Rapid	No detectable effect	None
	* Oxygen demand	* Lower dissolved oxygen for organisms to utilize, mortality from anaerobic conditions	Unlikely	Rapid	No detectable effect	None
SURFACE DISCHARGE Particulates	* Increased suspended particulate matter (sediments, nodule fragments and benthic debris)	* Effect on Zooplankton - Mortality	Unlikely	Rapid ⁴	No detectable effect ²	None
		- Change in abundance and/or species composition	Unlikely	Rapid ⁴	No detectable effect ⁴	None
		- Trace metal uptake	Unlikely	Rapid ⁴	Locally Adverse	Low ⁴
		- Increased food supply due to introduction of benthic biotic debris and elevated microbial activity due to increased substrata	Unlikely	Rapid ⁴	Possibly Beneficial	None
		* Effect on adult fish	Unlikely	Rapid ⁴	No detectable effect ²	None
		* EFFECT ON FISH LARVAE	Uncertain (Low)	Uncertain (Probably Rapid)	Uncertain	Low ⁴
	* Oxygen Demand	* Lower dissolved oxygen for organisms to utilize	Unlikely	Rapid	No detectable effect	None
	* Pycnocline accumulation	* Effect on primary productivity	Unlikely	Uncertain (Probably Rapid)	Unknown (Prob Undetect)	Low
	* Decreased light due to increased turbidity	* Decrease in primary productivity	Certain	Rapid ⁴	Locally Adverse	Low
	SURFACE DISCHARGE Dissolved Substances	* Increased nutrients	* Increase in primary productivity	Very Low	Rapid ⁴	No detectable effect ²
		* Change in phytoplankton species composition or introduction deep-sea microbes or spores to surface	Very Low	Rapid ⁴	No detectable effect ²	None
* Increase in dissolved trace metals		* Inhibition of primary productivity	Very Low	Rapid ⁴	No detectable effect ²	None
* Supersaturation in dissolved gas content		* Embolism	Very Low	Rapid	No detectable effect ²	None

APPENDIX II (CONTINUED)

INITIAL CONDITIONS ¹	PHYSICO-CHEMICAL EFFECTS	POTENTIAL BIOLOGICAL IMPACTS (REMAINING CONCERNS IN CAPITALS)	POTENTIAL SIGNIFICANCE OF ECOLOGICAL IMPACT			
			PROBABILITY OF OCCUR- RENCE	RECOVERY RATE	CONSEQUENCE	OVERALL SIGNIFICANCE
DISTURBANCE						
1	Includes characteristics of the discharge and the mining system.		Uncertain		- Some knowledge exists, however the validity of extrapolations is tenuous.	
2	Based on experiments/measurements conducted under DOMES.					
3	Years to tens of years, or longer		Unknown		- Very little or no knowledge exists on the subject; predictions mainly based on conjecture.	
4	Days to weeks.					
			*Area of future research SPM = Suspended Particulate Matter			

APPENDIX II (CONTINUED)

INITIAL CONDITIONS ¹	LICENSE PHASE		PERMIT PHASE		PARAMETERS OF CONCERN
	MEDICATION	MONITORING	POSSIBLE MITIGATION	MONITORING	
DISTURBANCE	None	Study tests	Premature	Study mutual operations	Natural history, recolonization, subarea mortality
	None	Verify predictions during tests	Premature	Premature	Community size, structure, and population oscillations for scavengers; behavior of benthic organisms
BENTHIC PLUME	Proximity of sites, Stable Reference Areas	Study tests	Control dispersion; require compact shape of site	Study mutual operations	Natural history; recolonization; fate of plume (suspended particulates); mortality away from subarea, mine site shape; proximity of mine sites
	None	Verify predictions during tests	Premature	Premature	SPM concentration; dissolved oxygen of bottom water
	None	Verify predictions during tests	Premature	Premature	Chemistry of bottom and interstitial waters
	None	Verify predictions during tests	Premature	Premature	Dissolved oxygen for bottom water
	None	Verify predictions during tests	Premature	Premature	SPM concentration and zooplankton mortality
SURFACE DISCHARGE Particulates	None	Verify predictions during tests	Premature	Premature	Nutrient content of surface waters, SPM concentration, zooplankton mortality and species changes
	None	Surface discharge and zooplankton in and around plume	Premature (could retain nodule fines on ship if necessary or discharge beneath surface)	Surface discharge	Mobile fines in discharge; uptake in zooplankton tissues; trace metal concentrations in surface water
	None	Verify predictions during tests	Premature	Premature	SPM concentration; dissolved oxygen in surface waters
	None	Verify predictions during tests	Premature	Premature	SPM concentration; effects on feeding and spawning of larvae
	None	Fish larvae in and around plume	Premature (could discharge at depth if necessary)	Premature	Fish larvae mortality; dissolved metal content of discharge
	None	Verify predictions during tests	Premature	Premature	Dissolved oxygen of surface waters; SPM concentration
	None	Verify predictions during tests	Premature	Premature	SPM concentration and settling velocities
	None	Verify predictions during tests	Premature	Premature	SPM concentration; light attenuation values; particles settling rates
SURFACE DISCHARGE Dissolved Substances	None	Verify predictions during tests	Premature	Premature	Nutrient content of discharge
	None	Verify predictions during tests	Premature	Premature	Nutrient content of discharge; changes in species composition; rate of substrate uptake by phytoplankton
	None	Verify predictions during tests	Premature	Premature	Dissolved trace metals in discharge; SPM concentration
	None	Verify predictions during tests	Premature	Premature	Fish mortality; dissolved O ₂ content of plume and ambient waters

TABLE 15 SUMMARY OF INITIAL ENVIRONMENTAL CONCERNS AND POTENTIAL SIGNIFICANT IMPACTS OF MINING

Source: 1 NAT'L OCEANIC & ATMOSPHERIC ADMIN., U.S. DEP'T COMMERCE, DEEP SEABED MINING: FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT 126-27 (1981).

APPENDIX III

CUMULATIVE WORLD DEMAND FOR NODULE METALS
AND THE DEEP SEABED CONTRIBUTION

Metal	Total World Demand to 2010 AD (x10 ³ short-tons)	Deep Seabed Mining Cumulative Production to 2010 AD (x10 ³ short-tons)	Deep Seabed Production as a Percent of Total World Demand
Nickel	31,000	11,300	36
Copper	530,000	9,400	1.8
Cobalt	1,400	1,400	100
Manganese	600,000	150,000	25

Source: 1 NAT'L. OCEANIC & ATMOSPHERIC ADMIN., U.S. DEPT. COMMERCE, DEEP SEABED MINING: FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT 279 (1981).

