

DELIMITATION, EXPLOITATION, AND ALLOCATION OF TRANSBOUNDARY OIL & GAS DEPOSITS BETWEEN NATION-STATES

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I. INTRODUCTION

Liquid hydrocarbon deposits often extend across national frontiers in such a manner that an entire deposit may be exploited, wholly or in part, from either side of the boundary line.¹ This characteristic of liquid hydrocarbons has been a fundamental cause of disputes, conflicts, and even wars in many parts of the world. As the economies of nation-states grow more dependent on this relatively cheap energy source, the likelihood of conflict will increase unless an international legal regime can be developed to resolve these disputes on a fair and equitable basis and upon which future treaties and agreements may be predicated. As a result, this area of law has increasingly attracted the attention of legal scholars and the international legal community.²

Because of the major impact this subject has on geopolitics and the world economy, it is difficult to understand why the most recent United Nations Convention on the Law of the Sea (UNCLOS) in 1982, did not squarely address the issue of liquid hydrocarbons. Although the 1982 UNCLOS specifically addresses some transboundary marine resources, such as submarine hydrocarbon deposits, it does not address the transboundary element of hydrocarbon deposits between two or more states or, between states and special zones.³

Although hydrocarbon market prices have fluctuated dramatically, experts predict that demand for this relatively cheap energy source and

1. Rainer Lagoni, *Oil and Gas Deposits Across National Frontiers*, 73 AM. J. INT'L L. 215, 215-16 (1979).

2. *Id.* at 215.

3. Alberto Szekely, *The International Law of Submarine Transboundary Hydrocarbon Resources: Legal Limits to Behavior and Experiences for the Gulf of Mexico*, 26 NAT. RESOURCES J. 733, 738-43 (1986).

chemical feedstock will grow significantly.⁴ As a result, pressure to develop transboundary energy reserves will also increase, and conflicts will be difficult to avoid. Thus, the development of transboundary hydrocarbon resources requires the attention of specialists to provide an adequate legal regime in order to prevent future conflicts.⁵ These legal regimes must also promote efficient and environmentally sound exploitation by those nations involved.⁶

The issues of delimitation and exploitation of transboundary liquid hydrocarbon deposits are a branch of international law that has immense global impact but, surprisingly, has remained quite stagnant with relatively few exceptions.⁷ This paper will attempt to give the reader a basic understanding of oil and gas exploration and extraction principles, summarize the existing international case law on transboundary oil and gas deposits, review developing trends, and postulate some rules for possible inclusion in the next United Nations Convention on the Law of the Sea. Alleviating the existing confusion surrounding the law of transboundary oil and gas deposits might help to defuse the international tensions associated with the indefiniteness of the current legal regime concerning transboundary oil and gas deposits.

II. HISTORICAL PERSPECTIVE

A. The Basics

Due to the migratory properties of oil and gas, liquid hydrocarbon deposits often extend across national boundaries in such a manner that the entire deposit may be exploited from either side of the boundary line.⁸ In this respect, deposits of fluid hydrocarbons differ from hard mineral deposits which are separated into discrete units by a state's frontier or boundary.⁹ Transboundary oil and gas deposits, clearly, "[d]o not conform well to property lines, licensing demarcations or political boundaries."¹⁰

4. Alberto Szekely et al., *Transboundary Hydrocarbon Resources: The Puerto Vallarta Draft Treaty*, 31 NAT. RESOURCES J. 609, 613 (1991).

5. *Id.*

6. *Id.*

7. Szekely, *supra* note 3, at 738.

8. Lagoni, *supra* note 1, at 215.

9. Alberto E. Utton & Paul D. McHugh, *On an Institutional Arrangement for Developing Oil and Gas in the Gulf of Mexico*, 26 NAT. RESOURCES J. 717, 722 (1986).

10. *Id.*

Oil and gas deposits are typically composed of porous rock bounded by impermeable strata which trap the hydrocarbons usually under high pressure. Drilling through the impermeable cap decreases the reservoir pressure allowing the oil and gas to migrate through the porous media to the source of lower pressure. This source is usually the newly drilled well. The fluids are then propelled to the surface by the hydraulic pressure of the water table exerted on the deposit and the expansion of gas trapped in the liquids. One can achieve a similar result by shaking a bottle of soda and then decreasing the internal pressure by opening the cap.

This production of hydrocarbons under the reservoir's own pressure is called primary production. Based on empirical data, primary production is usually capable of recovering fifteen to twenty-five percent of the oil in the deposit.¹¹ By using secondary recovery methods, such as injecting gas or water into the well, well pressures can be maintained and recoveries of up to eighty percent may be achieved.¹² Newer, more complex and costly methods of enhanced recovery, known as tertiary recovery, include surfactant flooding, carbon dioxide flooding, steam injection, and fire flooding¹³ can further increase recoveries.

Over many years, the United States has developed some rules of law, consisting of federal and state statutes, that address the problem of adjacent land owners exploiting transboundary oil and gas deposits.¹⁴ The rules center around an attempt to develop the deposit as a single unit with the cooperation from all other property interests in the deposit.¹⁵ This method of exploitation allows for optimum geologic placement of wells and produces maximum hydrocarbon recovery from the deposit.

B. The Early Years of Oil and Gas Law in the United States

A brief explanation of the development of oil and gas law in the United States may provide some perspective on possible solutions to transboundary oil and gas problems and issues in the international arena. During the period of the development of oil and gas law in the United States, the courts lacked "adequate understanding of the physical properties of oil and gas . . . and the subsurface structures containing

11. Will R. Knedlik, *Introduction to U. S. - Mexico Transboundary Resource Issues*, 26 NAT. RESOURCES J. 661, 683 (1986).

12. Utton & McHugh, *supra* note 9, at 722.

13. *Id.*

14. Larry S. Eubanks & Michael J. Mueller, *An Economic Analysis of Oklahoma's Oil and Gas Forced Pooling Law*, 26 NAT. RESOURCES J. 469, 470 (1986).

15. *Id.* at 469.

them."¹⁶ Consequently, courts used the Rule of Capture, by way of analogy to migratory wild animals and marine life, as the basis of law for transboundary oil and gas deposits.¹⁷ The courts held that liquid hydrocarbons, within transboundary deposits, belonged to the land owner who extracted and controlled them, regardless of whether the hydrocarbons being extracted on A's property had initially come from beneath B's property.¹⁸ In essence, B's property rights in oil and gas beneath his land were conditional upon his extraction and control of them. In fact, B's property rights extended to that portion of the deposit beneath A's property if B could extract and acquire them from his side of the boundary. Thus, the only solution an owner apparently had, if he was to retain the hydrocarbons that lay beneath his property, was to drill first and fast in order to extract and control the hydrocarbons before his neighbor did.¹⁹ Consequently, the early law created incentive to drill as many wells as quickly as possible in order to maximize individual production from the deposit, usually at a neighbor's expense. This self-serving and haphazard race to drill wells and produce the underlying oil and gas unnecessarily reduced the pressure in these reservoirs and, thus, reduced overall hydrocarbon recovery.²⁰ Little regard was given to the most efficient and effective development of the reservoir as a whole unit.

Spacing legislation eventually was passed limiting the number of wells that could be drilled per acre.²¹ This was followed by legislation regulating the production from each well based on overall market demand for hydrocarbons.²² These legislative acts helped maintain reservoir characteristics which maximized recovery of the deposit and thereby conserved the resource. Also, the legislation, by regulating production in an attempt to establish a balance between oil and gas supply and demand, helped to stabilize declining prices.²³

16. Utton & McHugh, *supra* note 9, at 722.

17. *Id.* at 722 n.28.

18. *Id.* at 722.

19. *Id.*

20. *Id.* at 723.

21. Utton & McHugh, *supra* note 9, at 723 n.32.

22. *Id.* at 723.

23. *Id.*

C. Forced Pooling and Unitization

The most cost effective method of maximizing production from oil and gas deposits requires the strategic placement of wells in the deposit.²⁴ By properly placing wells based on the physical and geological characteristics of the entire deposit, favorable reservoir characteristics can be maintained and production is thereby maximized.²⁵ Unitization, as it was called, requires all land owners to submit to development of the entire hydrocarbon deposit as a unit.²⁶ The trend has been toward compulsory unitization because of the obvious problems associated with voluntary unitization.

Unitization and forced pooling²⁷ promote drilling and production by allowing a producer to force other nonconsenting lease holders within the specified drilling area to participate in the drilling activities as either²⁸ a full working interest partner, wherein the land owner would have a percentage ownership in the well and bear the burden of his fair share of expenses, or as a royalty interest owner, wherein the producer would pay the land owner a one-time state determined bonus plus a royalty interest in lieu of ownership.²⁹ While there is no international law on the subject of joint management schemes, the United States law of unitization can be used to make a persuasive argument for its regular international use by analogy. Unitization was used internationally with success in some of the North Sea operations.³⁰

Rainer Lagoni suggests that international state practice, as reflected in common deposit arrangements in the past, may support the emergence of a customary rule of international law that would require states to cooperate in the exploration and exploitation of common deposits of oil and gas.³¹ If this were accomplished, and the 1982 UNCLOS required unitization for transboundary oil and gas deposits, the result would lead to maximized recovery (value) for all concerned parties, minimized waste, and minimized environmental concerns and operating

24. *Id.* at 724.

25. *Id.* at 723.

26. Eubanks & Mueller, *supra* note 14, at 470.

27. *Id.* at 469.

28. *Id.* at 470 n.3.

29. *Id.* at 471.

30. North Sea Continental Shelf Cases (F.R.G. v. Den; F.R.G. v. Neth.) 1969 I.C.J. 3, (Feb. 20), reprinted in 8 I.L.M. 340, 383 (1969); see LOUIS HENKIN ET AL., INTERNATIONAL LAW - CASES AND MATERIALS 1280-82 (3d ed. 1993).

31. Lagoni, *supra* note 1, at 243.

costs because transboundary deposits would be developed as a whole unit. It is also likely that a single operator would develop the deposit which would eliminate the duplication of effort and costs associated with multiple operators.

D. Marine Based Subsurface Hydrocarbon Deposits

Marine based subsurface hydrocarbon deposits pose a different set of problems. These problems usually concern the delimitation of the boundaries of the continental shelf and the Exclusive Economic Zone (EEZ) between the adjacent or opposing nation-states.³² The first problem is delimitation of the continental shelf.

E. Continental Shelf: Delimitation - The Drawing of Boundaries

Article 83 of the 1982 UNCLOS deals specifically with the delimitation of the continental shelf between nation-states with opposite or adjacent coasts.³³ In essence, it says that nation-states engaged in the delimitation of adjacent or opposite boundaries of their continental shelves shall do so by agreement in accordance with Article 38 of the Statute of the International Court of Justice (ICJ) “[i]n order to achieve an equitable solution.”³⁴ This provides little direction except to advise states that it is up to them to negotiate.

The adoption of a bargaining process, rather than a more mathematical approach to delimiting the continental shelf area leads some experts to believe that Article 83 was intentionally left vague by the states during negotiations. It is further believed that it was motivated by greed for the resources within the shelf.³⁵ Under the current system it may be possible for states with stronger bargaining positions to end up with more than their fair share of the continental shelf and its resources at the expense of others. However in many instances, it is all too probable that agreement will not be reached, and this will result in dispute, gridlock, or submission to the International Court of Justice for resolution.³⁶

It seems as though the drafters of the 1982 UNCLOS have not taken a definitive posture on this contentious issue. Perhaps this was done

32. See Lagoni, *supra* note 1, at 217.

33. United Nations Conference on the Law of the Sea, *opened for signature* on Dec. 10, 1982, art. 83, U.N. Doc. A/CONF. 62/122 (1982); *reprinted* in 21 I.L.M. 1261 (1982) [hereinafter UNCLOS].

34. *Id.* at 1286.

35. Szekely, *supra* note 3, at 741.

36. HENKIN ET. AL., *supra* note 30, at 1231.

to accommodate as many states as possible with a watered down agreement in order to get the requisite number of states to ratify the treaty and deal with the tough issues later, or to sit back and wait for the states themselves to create law on the issue of continental shelf delimitation by their customs and practice over time.

F. High Seas Exploitation of Natural Resources

The freedom to fish remains one of the oldest freedoms of the sea.³⁷ The 1982 UNCLOS confirmed the freedom of fishing for all states and their people, but also recognized the need to regulate and conserve the living resources of the seas.³⁸ Articles 116 through 118 address states' rights and duties of fishing, conservation of living resources of the seas, and cooperation and management of those living resources.³⁹

1. Who Owns the Resources of the High Seas?

An attitude already exists that the living resources in the water column of the high seas have always been available to all nations. That attitude has yet to extend to the minerals on and beneath the seabed. At present, the option to explore and extract minerals from the seabed is available only to those few nation-states who have adequate technology and financial resources. However, given that technology and financial resources are readily available, the resources must be able to be exploited in a commercially economical manner in order to make the effort worthwhile.

As high technology reduces the cost and increases the commercial viability of exploration and extraction of minerals in the deep waters of the seas, the legal question becomes: Who is, or should be, entitled to exploit these resources and under what bases and limitations?⁴⁰ What is needed is a legal regime that will give incentive to the nations with the technology and financial resources to exploit the seabed, ensure that a state's claim is protected against encroachment by other nations, and assure that those who take the risks will be able to reap the rewards.⁴¹ As with other branches of the law, it is virtually impossible to define the entire legal regime prior to allowing exploitation to begin; however, some basic rules become necessary if conflicts are to be avoided. The law should then develop

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.* at 1308.

41. HENKIN ET. AL., *supra* note 30, at 1308-09.

naturally based on practice or custom and the treaties that are formed between nations. It should be noted that General Assembly Resolution 2574D (XXIV) (1969) deals with the Moratorium on Exploitation of Resources of the Deep Seabed. The United States challenged the statement of law reflected in the resolution and the authority of the Assembly to declare a "moratorium."⁴²

In the 1982 UNCLOS, Articles 136 through 140 address the mining of natural resources of the seabed. Articles 136 and 137 state that the seabed area of the high seas and its resources are for the common heritage of mankind and that no state, natural person, or juridical person shall claim or exercise sovereignty or sovereign rights over any part of the area or its resources.⁴³ Any attempt to acquire such rights will not have legal recognition by the appropriate authority.⁴⁴ Article 139 specifies that joint and several liability will apply to parties who, while acting together, fail in their responsibilities or duties to maintain compliance with the Convention which results in damages to other parties.⁴⁵ Article 140 specifies that seabed mining in the high seas shall be carried out for the benefit of mankind as a whole. This article also provides that equitable sharing of financial and other economic benefits derived from activities in the high seas area shall be made on a nondiscriminatory basis.⁴⁶

2. Share the Bounty—Share the Cost?

Some may argue that the seabed resources belong to all the nations of the world, and that even though they may be exploited by a few nations that are financially capable, they should be made available to all. The international marketplace and international commerce have already created a system of distributing wealth based on supply and demand which, in turn, determines price and availability. However, some regulation may be necessary to ensure the world's access to these resources. Perhaps all nations should have the opportunity to participate in the bounty of the seabed by either sharing in the cost of exploitation or by being afforded the opportunity to purchase these minerals at fair market value.⁴⁷ The same

42. *Id.* at 1316.

43. United Nations Conference on the Law of the Sea, *supra* note 33, arts. 136, 137.

44. *Id.*

45. *Id.* art. 139.

46. *Id.* art. 140.

47. When dealing in global economies, even something apparently as simple as deciding on a fair market price is problematic. Price is usually a function of local market demand and, varies based upon the geographic location of the nation wishing to purchase. This complication allows one to look more favorably upon the joint participation scenario.

guiding principles that govern transboundary resources should apply to seabed exploration: duty of good faith and cooperation, duty to share data, duty to protect the environment, and the duty to avoid wasteful practices in order to conserve the resources.

III. THE INTERNATIONAL LAW OF TRANSBOUNDARY RESOURCES

Liquid mineral deposits that extend across national frontiers on land or a dividing line on the continental shelf between adjacent or opposite states have increasingly attracted attention in international law during the late 1960's and 1970's.⁴⁸ An emerging legal concept of cooperation between neighboring states has already occurred when two or more states share water resources.⁴⁹ It appears likely that this concept of cooperation will be extended to transboundary hydrocarbon deposits.⁵⁰

The 1982 UNCLOS does not address the transboundary element of these deposits between nation states and special zones;⁵¹ therefore, nation-states are left to their own devices within the context of a few guiding principles to formulate a solution. Several principles have developed over time and proven useful in transboundary issues, such as consultation and negotiation toward the conclusion of agreements for joint cooperation, the principle of adequate and effective exploitation, the principle that the coastal state may enter into joint cooperation schemes without relinquishing its rights over that part of the deposit on its side of the delimitation line, the emerging principle of equal sharing in benefits derived from the exploitation of the transboundary deposit, and the emergence of the principle of unitization.⁵²

Mexican-U.S. experience in the field of transboundary resources has contributed to some of the guiding international principles ruling the use and conservation of transboundary resources, namely: the duty of each country at either side of the border, when exploiting its part of the resource conceived as a natural unity, to refrain from producing a sensible harm; the principle of equitable

48. Lagoni, *supra* note 1, at 215.

49. *Id.* (quoting INTERNATIONAL LAW ASSOCIATION, REPORT ON THE FIFTY-SECOND CONFERENCE HELD AT HELSINKI 1966, 477 et seq. (1967)). See also OSCAR SCHACHTER, SHARING THE WORLD'S RESOURCES 64, 74 (1977); Symposium, U.S. - Mexican Transboundary Resources, (pt. II) 18 NAT. RESOURCES J. (1978).

50. Lagoni, *supra* note 1, at 215.

51. Szekely, *supra* note 3, at 738.

52. *Id.* at 766.

and rational utilization; and the duty to undertake previous consultations and to exchange information.⁵³

These principles constitute "good neighborliness."⁵⁴

Mexico proposed the concepts of good faith and non-abuse of rights at the third UNCLOS.⁵⁵ These concepts are basic to transacting business between nations and should be directly incorporated in the legal regime of transboundary resources. Hard mineral deposits across frontiers are dealt with in reference to territorial sovereignty, sovereign rights, and territorial integrity.

A. Legal Concepts

1. Sovereignty and Sovereign Rights

"The territorial sovereignty of nation-states extends to the mineral resources in the soil and subsoil of their land territory and territorial sea to an unlimited depth."⁵⁶ "This exclusive authority exists whether or not the deposit has been discovered or the state is able or intends to exploit it."⁵⁷ No nation-state may exercise rights over these mineral resources without consent of the state under whose territory they reside.⁵⁸ This holds true as well for mineral resources within the territory of the continental shelf; however, in that situation nation-states have exclusive sovereign rights rather than full territorial sovereignty over the resources.⁵⁹ Although the literature makes a distinction between sovereignty and exclusive sovereign rights, none will be made for purposes of this discussion.⁶⁰

53. Knedlik, *supra* note 11, at 683.

54. See Szekely, *supra* note 3, at 738.

55. *Id.*

56. Lagoni, *supra* note 1, at 216 (citing L. OPPENHEIM, INTERNATIONAL LAW 462 (8th ed. H. Lauterpacht, 1955); I, 2 P. FAUCHILLE, TRAITE DE DROIT INTERNATIONAL PUBLIC 99 (H. Bonfils, 8th ed. 1925)).

57. Lagoni, *supra* note 1, at 216.

58. *Id.*

59. *Id.* (citing North Sea Continental Shelf Cases, 1969 ICJ 3, at 22 (Feb. 20). See also Geneva Convention on the Continental Shelf, art. 2, Apr. 29, 1958, 15 U.S.T. 471, 499 U.N.T.S. 311. The state's authority over the mineral resources of its land territory and territorial sea is based on the concept of territorial sovereignty as an essential part of its legal personality, whereas its sovereign rights over the mineral resources in the soil and subsoil of its continental shelf are derived from the geographical concept of natural prolongation. *Id.* at 31.

60. *Id.* at 216.

2. Territorial Integrity

Territorial integrity is a “necessary corollary to the principle of territorial sovereignty.”⁶¹ It protects the sanctity of a nation-state’s territory from unauthorized invasion by another nation-state.⁶² For example, this principle would be violated by the unauthorized mining through the boundary line by state A into part of a shared deposit residing within the territory or continental shelf of state B or by state A conducting mining operations within its boundary which results in material damage to the territory of state B.⁶³ The rule of law that another state is responsible for material damage it causes to another state’s territory has been developed by analogy to the damage to a state by extraterritorial effects such as air and water pollution.⁶⁴

Violations of the principle of territorial integrity for oil and gas deposits are especially difficult to establish.⁶⁵ Complicated characteristics of these deposits such as equilibrium of rock pressure, gas pressure, and underlying water pressure affect the extraction process to the extent that extracting hydrocarbons at one point will inevitably change conditions within the entire contiguous deposit.⁶⁶ Thus, this character of transboundary fluid hydrocarbon deposits often creates tension even between nations who may have enjoyed the best of relations in the past. In this author’s opinion there has been some suggestion and speculation in the media that land based transboundary hydrocarbon issues were, in part, responsible for Iraq’s invasion of Kuwait.

3. Territorial Sea

Once states had acknowledged the idea of a territorial sea about the coast, they had to address themselves to the matter of its breadth.

61. Lagoni, *supra* note 1, at 217.

62. See, Lagoni, *supra* note 1.

63. *Id.* at 217.

64. *Id.* (citing Gunther Handl, *Territorial Sovereignty and the Problem of Transnational Pollution*, 69 AM. J. INTL. L. 50, 72 (1975)). The author inferred this rule from extensively discussed principles and concepts, basing it on well known precedents and state practice, such as, the principle of territorial integrity, the emerging principle of *sic utere tuo ut alienum non laedas*, the concept of good neighborliness as representing an expansion of the principle of abuse of rights, and, *inter alia*, the Corfu Channel Case, 1949 I.C.J. 22 (Apr. 9), and the Trail Smelter Arbitration, 3 R. INT'L ARB. AWARDS 1905, *passim*.

65. *Id.* at 217.

66. *Id.* at 217 (quoting Northcutt Ely, *The Conservation of Oil*, 51 HARV. L. REV. 1209, 1219 (1937-38)); HOWARD R. WILLIAMS ET AL., CASES AND MATERIALS ON THE LAW OF OIL AND GAS 1-12 (3d ed. 1974).

Territorial sea limits varied over historical time and were based on such theories as the line-of-sight doctrine, the cannon-shot rule, and the marine league doctrine.⁶⁷ These doctrines have outlived their usefulness. Based upon the principles for which they were originally formulated, where does one draw the boundary line now?

In 1793, the United States became the first country to adopt a three mile limit in its domestic laws.⁶⁸ Later the three mile limit generally became recognized by international treaty and was accepted by nation-states until the early 1960's. Although it was recorded by the 1930 Hague Conference as common practice,⁶⁹ it was never codified.⁷⁰ The ILC suggested a twelve mile upper limit in its 1956 report, but it did not specify any specific limit between three and twelve miles.⁷¹ In accordance with the 1982 UNCLOS, every nation-state has the right to establish the breadth of its territorial sea up to a limit not exceeding twelve nautical miles, measured from the low water line along the coast unless otherwise provided.⁷² As a matter of course, the limit is generally set by states at twelve nautical miles.⁷³

4. Continental Shelf

"The concept of national jurisdiction over a continental shelf beyond the territorial sea is relatively modern in origin, usually being traced to the 1945 Truman Proclamation."⁷⁴ The 1958 Geneva Convention on the Continental Shelf defined the continental shelf "[t]he 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."⁷⁵ Later, in the North Sea Continental Shelf Cases, the International Court of Justice (ICJ) recognized the continental shelf of the coastal state as a "[n]atural prolongation of its land territory existing ipso facto and ab initio, by virtue of its sovereignty over the land,

67. HENKIN ET. AL., *supra* note 30, at 1240.

68. *Id.* at 1241.

69. *Id.* at 1240-44.

70. *Id.* at 1242.

71. *Id.* at 1243.

72. HENKIN ET. AL., *supra* note 30, at 1245.

73. *Id.*

74. Ernst Willheim, *Australia - Indonesia Seabed Boundary Negotiations: Proposals for a Joint Development Zone in the "Timor Gap"*, 29 NAT. RESOURCES J. 821, 826 (1989).

75. ZDENIK J. SLOUKA, *INTERNATIONAL CUSTOM AND THE CONTINENTAL SHELF* 89 (1958).

and as an extension of it, an exercise of sovereign rights for the purpose of exploring the seabed and exploiting its natural resources.”⁷⁶

5. Exclusive Economic Zone (EEZ)

Louis Henkin notes that during the negotiations for the 1982 UNCLOS, extensive pressure from states with varying interests at stake led the Convention to adopt the Exclusive Economic Zone (EEZ).⁷⁷ Articles 55 through 58 of the 1982 UNCLOS establish and define the EEZ at 200 nautical miles from the baseline of the territorial sea.⁷⁸ The EEZ gives the coastal state sovereign rights, but not sovereignty,⁷⁹ for certain sanctioned activities such as for the purpose of exploring, exploiting, conserving, and managing the natural resources, whether living or non-living, on the seabed, in the subsoil, and the superjacent waters. The EEZ also gives coastal states rights to other activities for the economic exploitation and exploration of the zone.⁸⁰ All other states enjoy freedom of navigation, overflight, and other lawful acts associated with the operation of ships, aircraft, submarine cables, and pipelines that are compatible with the 1982 UNCLOS.⁸¹

Although the 1982 UNCLOS does not specifically designate the EEZ as part of the high seas, the United States and other maritime states believe the convention reflects the general understanding that, as a matter of customary law as well as under the convention, their rights and freedoms of navigation, overflight, and laying of submarine cables and pipelines, are available to other states in the EEZ and are the same as on the high seas. However, the rights of noncoastal states to participate in fishing and other commercial activity is subject to the special rights of the coastal state.⁸²

76. Willheim, *supra* note 74, at 826 (citing North Sea Continental Shelf Cases, 1969 I.C.J. 3 (Feb. 20)).

77. HENKIN ET. AL., *supra* note 30, at 1291.

78. *Id.* at 1293.

79. For purposes of this discussion, there is no discernible distinction between sovereign rights and sovereignty for minerals beneath the continental shelf.

80. HENKIN ET. AL., *supra* note 30, at 1292 (citing U.N. Convention on the Law of the Sea, Dec. 10, 1982, art. 65, U.N. Doc. A/CONF. 62/122 (1982); *reprinted* in 21 I.L.M. 1261 (1982), art. 56).

81. *Id.* at 1292 (referring to Article 58 of the 1982 UNCLOS).

82. RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES § 514, cmts. b, c, d, e (1987).

6. Contiguous Zone

Kenneth P. Beauchamp states that “[t]he theory of free ocean use beyond the territorial sea became subject to certain recognized exceptions in a belt of water adjacent to, and extending seaward from, the territorial sea.⁸³ Initially during time of war, a coastal state would stop and search vessels nearing its coast.”⁸⁴ This activity grew into state enforcement of various other specific functions in line with its economic and trade interests and activities, such as a state’s concern for drug running close to its shores or territorial sea.⁸⁵

William W. Bishop, in a paper prepared for the sixth conference of the Inter-American Bar Association in 1949, justifies the expansion of control of the coastal state over the seas adjacent to its coast:

The exercise of jurisdiction in contiguous zones of the high seas becomes necessary in view of the inadequacy under modern conditions of any reasonable breadth of territorial waters; whatever we may regard as the breadth of marginal sea now accepted under international law, there are occasions and purposes for which jurisdiction must be exercised farther out from shore. This differs from an attempt to declare such areas territorial waters subject to the full sovereignty of the coastal state.⁸⁶

Bishop describes a state’s sovereign rights as distinguished from sovereignty in what is now known as the Contiguous Zone. Article 33 of the 1982 UNCLOS defines the Contiguous Zone as that area of sea, contiguous to its territorial sea, in which a nation state may exercise control necessary to prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea. The contiguous zone may not extend beyond twenty-four nautical miles from the

83. Kenneth P. Beauchamp, *The Management Function of Ocean Boundries*, 23 SAN DIEGO L. REV. 611, 633 (1986).

84. *Id.*

85. *Id.*

86. William W. Bishop, Jr., *The Exercise of Jurisdiction for Special Purposes in High Seas Beyond the Outer Limit of Territorial Waters* (paper prepared for the Inter-American Bar Association, Sixth Conference, Detroit, May 1949), reprinted in 99 CONG. REC. 2493 (1953).

baselines from which the breadth of the territorial sea is measured.⁸⁷

7. High Seas

Principles of common usage and freedom once governed all the seas. Emergence of the territorial sea and other special zones reduced the areas subject to the regime of the high seas. Further reduction in the area governed by the principles of the high seas resulted as an exclusive economic zone, and archipelagic states were recognized. The high seas are reduced even further by the special purpose zones that are specifically designated for scientific research and pollution control, etc., and by states' sovereign rights in extended continental shelves beyond the 200 mile limit of the EEZ.⁸⁸ Articles 86 through 90 of the 1982 UNCLOS define the EEZ and some of the rights of its use.

As technology allows drilling efforts to take place in deeper water, resolution of ownership of transboundary hydrocarbon deposits across the EEZ and the high seas will become an issue for which nations should prepare. There will be many concerns, such as: who has rights to that portion of hydrocarbons beneath the high seas; who is responsible for the costs associated with extraction of that portion of the hydrocarbons beneath the high seas; on what basis will production be allocated, and to whom will it be allocated? These appear to be simple questions until it is realized that, in theory, the entire global community of states has rights to the resources of the high seas.

8. Joint Development Zone (JDZ)

States may designate joint development zones (JDZ) by agreement absent the desired agreement on boundary delimitation: Article 83 section 3 of the 1982 UNCLOS provides that parties "[p]ending agreement . . . the states concerned . . . shall make every effort to enter into provisional arrangements of a practical nature."⁸⁹ This type of arrangement permits business and commerce to continue by allowing exploitation of the natural resources so that they may be utilized by both states while the delimitation of the boundary is still in dispute. Upon entering into a joint development arrangement most states are concerned that any interim arrangement does

87. United Nations Convention on the Law of the Sea, *opened for signature* on Dec. 10, 1982, art. 33, U.N. Doc. A/CONF. 62/122(1982), *reprinted* in 21 I.L.M. 1261, 1276 (1982) [hereinafter UNCLOS].

88. HENKIN ET. AL., *supra* note 30, at 1297.

89. UNCLOS, *supra* note 87, at 1276.

not prejudice its long term interests toward a favorable delimitation. While agreeing on the delimitation of the JDZ is a substantial task, the more formidable task is that of applying the legal and administrative systems of both states to the JDZ so that all the attributes of sovereign rights of both states are effectively combined.

This situation also presents the possibility, and the potential danger, of discovering hydrocarbons on the boundary of one of the states and the JDZ. This possibility will be a sufficient reason to enlarge the JDZ at the expense of narrowing that state's continental shelf area, diminishing the JDZ to the detriment of the other state, or to work out some sort of equitable arrangement to avoid a conflict. As desirable as it might be to have a definitive set of rules to apply to a boundary dispute situation, there will always be exceptions. Why not just let legal precedent evolve naturally by treaty and custom? Joint development is a workable situation, but only if the nation-states involved have the intention of making it work.

9. Functional Zones

The functionalistic view of the state doctrine based on territorial sovereignty is that it is inappropriate for the resolution of international conflicts over global issues. Therefore, functional zones provide a state with control for limited purposes not based on sovereignty, but rather, based on specific sovereign rights that have been granted.⁹⁰ The EEZ can be said to be a functional zone since the state only has exclusive rights to the resources of the water column, the seabed, and the subsurface minerals, but not sovereignty over this area.

B. *The 1982 Law of the Sea Convention: The Law of the Sea Generally*

A law of the sea is as old as nations, and the modern law of the sea is virtually as old as modern international law. For three hundred years, it was probably the most stable and least controversial branch of international law. It was essentially reaffirmed and codified as recently as 1958. By 1970, it was in disarray.⁹¹

"An early and basic principle of the law of the sea was that of freedom. The sea could not be acquired by nations and made subject to

90. Beauchamp, *supra* note 83, at 633.

91. Paul D. McHugh, *International Law - Delimitation of Maritime Boundaries*, 25 NAT. RES. J. 1025 (1984) (quoting LOUIS HENKIN, *HOW NATIONS BEHAVE* 212 (2d ed. 1979)); HENKIN ET. AL., *supra* note 30, at 1231.

national sovereignty.”⁹² Coastal states have recently sought to increase and expand their jurisdiction over their adjacent sea areas through different zones of jurisdictional control articulated in the United Nations Conference on the Law of the Sea (UNCLOS).⁹³

The law of the sea was largely customary law, until it was codified and developed by the International Law Commission in a major undertaking culminating in the first United Nations Conference on the Law of the Sea (UNCLOS) in 1958. That Conference adopted conventions: on the Territorial Sea and the Contiguous Zone, on the High Seas, on the Continental Shelf, and on Fishing and Conservation of the Living Resources of the High Seas.⁹⁴

In the decades following the 1958 UNCLOS, worldwide changes necessitated a rewriting.⁹⁵ In 1973, following the U.N. General Assembly’s effort in dealing with the resources of the seabed beyond national jurisdiction, the third U.N. Law of the Sea Conference was convened at which virtually the whole law of the sea was reexamined.⁹⁶ Eight years of negotiations produced the Draft Convention on the Law of the Sea which was considered virtually complete.⁹⁷ However, the provisions on the contentious issue of seabed mining were largely rejected.⁹⁸ A final draft of the UNCLOS was approved on April 30, 1982, by a vote of 130 states in favor, 4 against, and 17 abstentions. The United States, Israel, Turkey and Venezuela voted against the final draft.⁹⁹ It is interesting to note that Turkey and Venezuela were embroiled in continental shelf delimitation disputes during this time.¹⁰⁰ The Treaty received the necessary 60th ratification on November 16, 1993,¹⁰¹ and came into force in 1994. “Insofar as the Convention merely codifies customary law, it reflects law binding also on states that have not adhered to it.”¹⁰²

92. McHugh, *supra* note 91, at 1029.

93. HENKIN ET. AL., *supra* note 30, at 1289.

94. *Id.* at 1232 (citation omitted).

95. *Id.*

96. *Id.*

97. *Id.*

98. HENKIN ET. AL., *supra* note 30, at 1313.

99. *Id.*

100. *Id.*

101. *United Nations Convention on the Law of the Sea Receives Sixtieth Ratification to Enter into Force in One Year*, United Nations Office of Legal Affairs SEA/1396/Rev. 1, (Nov. 19, 1993) (sixtieth ratification received on November 16, 1993).

102. HENKIN ET. AL., *supra* note 30, at 1232.

This Convention is significant in that it enables a coastal state to establish an EEZ beyond its territorial sea. The state's EEZ may extend 200 nautical miles from its territorial sea baselines, within which it has sovereign rights for the purposes of exploring and exploiting the natural resources of the water column and the seabed. The coastal state also has jurisdiction in the EEZ for purposes such as the protection of the marine environment.¹⁰³ It also adopted a two part definition of the continental shelf: either 200 nautical miles from the base lines from which the territorial sea is measured, or to the limits of the actual continental shelf beyond 200 nautical miles through the prolongation of the state's land territory to the outer edge of the continental margin.¹⁰⁴ In the latter case, a wealth sharing system operates in which the coastal state makes contributions to an escrow fund for distribution based on its production of the non-living resources beyond the 200 mile limit.¹⁰⁵ This raises an interesting question of whether the state has sovereign rights in the water column of its continental shelf extending beyond the 200 mile limit.

C. Jurisdiction

Traditionally, international law divided the seas into two legal categories: those under sovereignty of the coastal states; and the high seas.¹⁰⁶ In the recent past, however, coastal states have sought to increase and expand their jurisdiction over their adjacent sea areas.¹⁰⁷ This expansion of coastal state jurisdiction has changed people's perception of the sea and the applicable law.¹⁰⁸ The seas have been divided into different legal regimes, with the principle of common usage applicable only in the areas beyond national jurisdiction where the high seas begin.¹⁰⁹ Difficulties and conflicts can sometimes arise in the overlap areas, over which more

103. Willheim, *supra* note 74, at 826 (citing Official Records of the Third United Nations Conference on the Law of the Sea, U.N. Doc. A/CONF. 62/122 (Oct. 7, 1982) [hereinafter Official Records]).

104. *Id.* at 827 (citing Official Records at 33, art. 76).

105. United Nations Convention on the Law of the Sea, U.N. Doc. A/CONF. 62/122 (1982), reprinted in 21 I.L.M. 1261, 1285 (1982) (article 76). The contributions are to begin after the first five years of production at that site. In the sixth year, the rate of payment or contribution is one percent of the value or volume of production at the site. The rate increases by one percent for each subsequent year until the twelfth year and remains at seven percent thereafter. *Id.* See also HENKIN ET. AL., *supra* note 30, at 1279-80.

106. McHugh, *supra* note 91, at 1028.

107. *Id.*

108. *Id.* at 1029.

109. *Id.*

than one nation state has jurisdiction because of these recent extensions of coastal states' jurisdictions.¹¹⁰ In these areas of dual or multiple jurisdiction, which law should govern in the delimitation of the boundary? These are some of the useful but difficult questions to answer.

D. Customary International Law

Customary international law is comprised of two distinct elements: general practice, and its acceptance as law.¹¹¹ As you can imagine, the development of sufficient practice among nations and its acceptance as a means of legal precedent is a painstakingly slow process. In 1958, the International Law Commission codified customary practices in the first UNCLOS.¹¹²

E. International Treaty Law

"Some debate exists as to whether treaties should be viewed as a source of international law or merely as a source of obligation, much like a contract."¹¹³ In the former case, treaties would set legal precedent. Insofar as these Treaties reflected current world views on the subject matter of transboundary hydrocarbon resources, it would be consistent to view the doctrines embodied in these treaties as emerging international law.

Although treaties governing transboundary resources describe unique situations between nations, common issues consistently arise.¹¹⁴ In the event that these common issues are treated by nations in relatively the same manner, the solutions should and would be considered to be emerging principles of international law.

The reality of the situation is that issues of transboundary resources between nations are resolved with each nation having its particular socioeconomic interests in mind. We are, therefore, not likely to see the solutions to these problems themselves emerge as law, but, rather, the guiding principles used in arriving at specific solutions appear to be the substance of the emerging law.¹¹⁵

110. See HENKIN ET. AL., *supra* note 30. See also Lagoni, *supra* note 1; UNCLOS, *supra* note 33.

111. McHugh, *supra* note 91, at 1029 n.26.

112. HENKIN ET. AL., *supra* note 30, at 1232.

113. McHugh, *supra* note 91, at 1030 n.35.

114. Szekely et. al., *supra* note 4, at 609.

115. *Id.*

F. International Case Law

"Article 38 of the Statute of the International Court of Justice requires the Court to apply judicial decisions, subject to the provisions of Article 59, as a subsidiary means for the determination of rules of law. Article 59 states that decisions of the Court are not binding except between the parties and in respect of that particular case. The Court's decisions, therefore, are not governed by the principle of *stare decisis*."¹¹⁶ However, this does not mean that the Court ignores precedent. It uses precedent as a persuasive argument rather than a binding one. If the Court does not follow precedent, those cases are likely distinguished from the one at bar.¹¹⁷

1. The North Sea Continental Shelf Cases

A partial delimitation of the continental shelf had been in effect by agreement in 1965, between Denmark, Netherlands, and Germany on the basis of equidistance from the nearest points on the baselines of the territorial seas of the parties.¹¹⁸ Agreement could not be reached on the remainder of the boundaries because of differences over the rules to be used.¹¹⁹ The Netherlands and Denmark asserted that due to lack of agreement between the parties and absent special circumstances, the principle of equidistance should be used.¹²⁰ Germany responded that the equidistance method would not lead to a just and equitable solution and that delimitation should be governed by equitable principles.¹²¹ The court left the final solution of delimitation to the parties and limited itself to providing criteria that the parties would take into account during negotiations including "[t]he physical and geological structure, and natural resources, of the continental shelf areas involved."¹²²

The court further stated in its decision, that the parties should resolve their differences by agreement, "[o]r failing that, by an equal division of the overlapping areas, or by agreements for joint exploitation, the latter solution appearing particularly appropriate when it is a question

116. McHugh, *supra* note 91, at 1032 nn. 43-45.

117. *Id.* at 1025.

118. North Sea Continental Shelf Cases, 1969 I.C.J. 3 (Feb. 20), *reprinted in* 8 I.L.M. 340 (1969). See HENKIN ET. AL., *supra* note 30, at 1280-82.

119. North Sea Continental Shelf Cases, 1969 I.C.J. 3 (Feb. 20), *reprinted in* 8 I.L.M. 340 (1969).

120. *Id.*

121. *Id.*

122. *Id.*

of preserving the unity of a deposit.”¹²³ The court also said that it “[d]oes not consider that unity of deposits constitutes anything more than a factual element which it is reasonable to take into consideration in the course of the negotiations for a delimitation.”¹²⁴ Even at this early stage of resolving transboundary issues, it appears that preserving the unity of the deposit as a means of economic and efficient exploitation was recognized but that it did not rise to the level of creating a special circumstance and that, in and of itself, would not alter the boundary delimitation.¹²⁵

2. United Kingdom/France Arbitration

France and the United Kingdom engaged in negotiations between 1970 and 1974, with the purpose of delimiting the continental shelf that lay between them.¹²⁶ The negotiations resulted in only limited agreement and the dispute was submitted to an arbitration commission by agreement in 1975.¹²⁷ The matter at issue in the arbitration had to do with the meaning of “special circumstances.”¹²⁸ Although the International Court of Justice (ICJ) in the North Sea Cases stated there “[i]s no legal limit to the considerations which states may take account of for the purpose of making sure that they apply equitable procedures . . .” it subsequently determined that the presence of hydrocarbons within the continental shelf alone was not sufficient to invoke special circumstances unless the parties otherwise provide by agreement.¹²⁹ Thus, it would not be sufficient to require a delimitation of boundaries based on equitable principles.

3. Greece/Turkey Aegean Sea Continental Shelf Case

In 1974, Turkey granted petroleum research permits and began to explore for oil and gas in the Aegean Sea outside the territorial sea of islands belonging to Greece.¹³⁰ Greece did not recognize Turkey’s claim to

123. *Id.*

124. North Sea Continental Shelf Cases, 1969 I.C.J. 3 (Sept. 11), *reprinted in* 15 I.L.M. 340 (1969).

125. *Id.*

126. Arbitration on the Delimitation of the Continental Shelf (Fr. v. U.K.), 18 I.L.M. 397 (1979).

127. *Id.*

128. *Id.*

129. *Id.*

130. Aegean Sea Continental Shelf Case (Greece v. Turk.), 1976 I.C.J. 3 (Sept. 11), *reprinted in* 15 I.L.M. 985 (1976); see, HENKIN ET. AL., *supra* note 30, at 820.

that portion of the seabed.¹³¹ Subsequently, the parties engaged in unsuccessful negotiations.¹³² Turkey then proceeded to send further scientific expeditions to the same area escorted by warships.¹³³ This action prompted Greece to submit the dispute to the ICJ in 1976.¹³⁴

Greece wanted not only a delimitation of the continental shelf between the two countries in the Aegean Sea, but also prevent Turkey from acquiring knowledge of the strata under Greece's continental shelf.¹³⁵ Turkey avoided the ICJ proceedings on jurisdictional grounds.¹³⁶ In terms of the development of international law, it is unfortunate that the ICJ did not have jurisdiction because the court would have had to address the problem of transboundary hydrocarbon resources within the scope of this dispute.¹³⁷

4. Iceland/Norway Conciliation Recommendations on the Continental Shelf Area Between Iceland and Jan Mayen Island.

Jan Mayen Island belongs to Norway and lies 292 miles off the coast of Iceland.¹³⁸ The island is of volcanic origin, and its year round population is about 30 to 40 residents.¹³⁹ The island received little attention until Icelandic fisherman netted a large catch of fish off its shores in 1978.¹⁴⁰ This raised the question of Jan Mayen's right to an EEZ and a continental shelf as contemplated in the UNCLOS then being drafted.¹⁴¹ Although Norway's title to Jan Mayen was by act of Parliament in 1929, Norway did not claim a 200 mile EEZ around the island when it

131. Aegean Sea Continental Shelf Case, 1976 I.C.J. 3 (Sept. 11), *reprinted in* 15 I.L.M. 985 (1976).

132. *Id.*

133. *Id.*

134. *Id.*

135. Aegean Sea Continental Shelf Case, 1976 I.C.J. 3 (Sept. 11), *reprinted in* 15 I.L.M. 985 (1976).

136. *Id.*

137. *Id.*

138. Agreement on the Continental Shelf Between Iceland and Jan Mayen (Ice. v. Norway), 21 I.L.M. 1222 (1982).

139. *Id.*

140. *Id.*

141. *Id.*

established one around the mainland.¹⁴² Norway's rush to correct its oversight in 1978, drew immediate objections from Iceland.¹⁴³

The parties agreed to refer the matter to a three member conciliation commission.¹⁴⁴ Each of the parties would appoint one member, and the third would be jointly selected.¹⁴⁵ The commission was to recommend a dividing line taking into account Iceland's strong economic interests in the seas in that area, and the pertinent geographical and geologic factors.¹⁴⁶ Because of the geology, the commission disregarded the prolongation principle, proportionality, and the median line.¹⁴⁷

A scientific committee was assembled to determine the potential for hydrocarbon deposits in the disputed area.¹⁴⁸ The commission ultimately suggested a detailed joint development zone comprised of the areas with the highest potential for hydrocarbons.¹⁴⁹ The establishment of a joint venture exploitation agreement was based on the principle of unitization.¹⁵⁰ The Court again, as in the North Sea Cases, recognized the importance and, in fact, depended on unitization for the most effective and economic recovery.¹⁵¹

5. Tunisia/Libya Continental Shelf Case

Tunisia and Libya submitted its question to the ICJ to determine exactly the principles and rules of international law which may be applied in delimiting the continental shelf between them. Both nations also wanted the Court to specify precisely the practical manner in which the principles should be applied so as to be able to accomplish the delimitation without difficulty.¹⁵² In this case the Court reiterated the natural prolongation principle, but did not specify the concept of "equitable principles" or

142. *Id.*

143. *Agreement on the Continental Shelf Between Iceland and Jan Mayen*, 21 I.L.M. 1222 (1982).

144. *Id.*

145. *Id.*

146. *Id.*

147. *Id.*

148. *Agreement on the Continental Shelf Between Iceland and Jan Mayen*, 21 I.L.M. 1222 (1982).

149. *Id.*

150. *Id.*

151. *Id.*; see also Elliot L. Richardson, *Jan Mayen in Perspective*, 82 AM. J. INT'L L. 443 (1988).

152. *Agreement to Submit Question of the Continental Shelf to the International Court of Justice (Libya v. Tunis.)*, 18 I.L.M. 49 (1979).

"special circumstances" and for that reason the two dissenting judges on the Court criticized the judgment as lacking in legal principle.¹⁵³ The Court came to the conclusion that the existing economic status of the parties may not be taken into consideration as part of "relevant circumstances" when delimiting the boundary. However, "[t]he presence of oil wells in an area to be delimited may, depending on the facts, be an element to be taken into account in the process of weighing all relevant factors to achieve an equitable result."¹⁵⁴

6. United States/Gulf of Maine Case

The essence of the Gulf of Maine case was a delineation of natural resources of both the seabed and the fisheries in the boundary area near George's Bank.¹⁵⁵ The ICJ actually drew the boundary line once the applicable rules and principles were determined. The United States and Canada requested that the Court use a single line to delimit both the continental shelf and the 200 nautical miles fisheries zone.¹⁵⁶

Historically, the jurisdiction over fisheries has been asserted on the basis of geography, and jurisdiction over the minerals in the continental shelf has been based on geology.¹⁵⁷ The Court formulated the general principles of equity applicable to a fair allocation of the resources between neighbors and fashioned a solution which was basically the average of the requests initially made by the parties.¹⁵⁸

7. Libya/Malta Case

In 1982, Libya and Malta requested the ICJ to decide the principles and rules of international law that were applicable to the delimitation of their respective continental shelves. Additionally, they requested that the court outline the practical application of these principles such that the Parties could delimit the areas without incident.¹⁵⁹ This was

153. Case Concerning the Continental Shelf (Tunis. v. Libya) 1982 I.C.J. 2, (Feb. 24), reprinted in 21 I.L.M. 225, 288 (1982).

154. *Id.* at 255.

155. Delimitation of the Maritime Boundary in the Gulf of Maine Area (U.S. v. Can.), 1984 I.C.J. No. 67 (Oct. 12); Thomas J. Trendl, *Maritime Delimitation and the Gulf of Maine Case: A Guide for the Future of Merely 'Slicing the Pie?'*, 12 S. ILL. U. L.J. 599 (1988).

156. Delimitation of the Maritime Boundary in the Gulf of Maine Area, *supra* note 155.

157. *Id.*

158. *Id.*

159. *Special Agreement for the Submission to the International Court of Justice of a Continental Shelf Dispute* (Libya v. Malta), May 1976, 21 I.L.M. 971 (1982).

the same problem in the Tunisia/Libya case only without the prejudicial influence of natural resources.

In 1956, Malta asserted that it informed Libya of its intention to delimit its continental shelf by means of a median line.¹⁶⁰ Libya's silence was interpreted as acquiescence which Malta claimed precluded Libya in law from challenging the validity of Malta's position.¹⁶¹ Malta also wanted the Court to take into account the relative economic position of the two states and the range of Malta's fishing activity. The Court refused to do this, stating that such conditions are totally unrelated to the applicable rules of international law.¹⁶² The Court gave greater weight to distance criteria where the distance between the two opposing coasts is less than 400 nautical miles.¹⁶³

8. Australia/Indonesia Seabed Case

A dispute over a portion of their common continental shelf area arose between Australia and Indonesia. There was overlap of their EEZs because the shelf distance between the two countries was less than 400 nautical miles. Australia asserted jurisdiction over its shelf based on the theory of natural prolongation of its land territory, as was promulgated in the North Sea Continental Shelf Cases.¹⁶⁴ Indonesia asserted jurisdiction based on the 200 nautical miles EEZ.¹⁶⁵ Under the 1982 UNCLOS, the extension of the land mass in a prolongation of the shelf appears to be a primary basis for continental shelf jurisdiction on the basis of sovereign rights and not sovereignty. Also, the 200 nautical miles EEZ is based on sovereign rights so it might be argued that these two states are on about equal footing regarding their assertions of jurisdiction.¹⁶⁶

The parties chose to resolve their differences in the disputed area by adopting a temporary three part Zone of Cooperation within which joint development activities were to proceed under different legal and economic sharing regimes.¹⁶⁷

160. *Id.*

161. *Id.*

162. *Id.*

163. *Id.* at 1203.

164. Willheim, *supra* note 74, at 828.

165. *Id.*

166. *Id.*

167. *Id.* at 840.

G. Delimitation of Continental Shelf Boundaries

As we have seen, the delimitation of boundaries in the continental shelf can be rife with problems. It seems that for every scientific way that might be proposed to dissect the disputed area, exceptions can be envisioned. For example, since the EEZ establishes sovereign rights in a 200 nautical mile belt of ocean measured from the base of the territorial sea, one can easily see that nation states divided by a body of water less than 400 nautical miles will not yield each state its requisite 200 nautical mile EEZ. Islands, close to shores of another state, pose a similar problem.

States whose continental shelves extend beyond the 200 nautical mile EEZ have been given partial sovereign rights in the minerals beneath the shelf.¹⁶⁸ This early attempt at designing a rudimentary set of rules actually created some conflicting situations. For example, states could each have a valid method and argument for delimiting its continental shelf. However, the application of the method proposed by each state might produce an incongruous result, as in the case of Iceland and the island of Jan Mayen. Application of Iceland's 200 nautical miles EEZ would have encroached on the sovereign rights of Jan Mayen's EEZ since they were only 292 nautical miles apart.¹⁶⁹

The relevant question becomes: In the face of all of the possible configurations of nation how does one arrive at a fair and equitable result in the delimitation of boundaries where hydrocarbon deposits are present? The author of this article agrees with Beauchamp's philosophy when he states: "The division of ocean space according to political ideas of boundary-making does not always relate to logical ocean management purposes."¹⁷⁰ Rather than boundary-making being about a quest for extending a nation state's territory, it should reflect the functional purposes for which the boundaries are being drawn.

168. See HENKIN ET. AL., *supra* note 30, at 1279-80.

169. Agreement on the Continental Shelf Between Iceland and Jan Mayen, 21 I.L.M. 1222 (1982).

170. See Beauchamp, *supra* note 83, at 656.

H. Delineation of Boundaries of Subsurface Fluid Hydrocarbon Deposits

1. Volume of Subsurface Hydrocarbons Residing within Each State

Fluid mineral deposits spanning across national boundaries cannot accurately be determined without the cooperation of all nation states involved. Geological data is needed for delimitation of the deposit boundaries which is likely available only from the individual states under which the deposit resides. The legal literature does not spend much time discussing the determination of the extent of the deposit. However, this is an important piece of information when calculating the allocation of production for each state. This is not so much an issue of technical acquisition of the data but rather an issue of the cooperation necessary from all parties involved. Cooperation is necessary in almost every facet of data acquisition, drilling, production, transportation, and processing of the hydrocarbons. Success of the project depends entirely on the level of cooperation and trust that the parties are willing to give to one another.

2. Non-Homogeneous Deposits or Processing of Comingled Hydrocarbons Originating from Separate Deposits

Although the literature consistently assumes that hydrocarbon deposits are homogeneous, this is not always the case. Different parts of a reservoir may produce hydrocarbons of different composition and, therefore, different relative value. If, for example, an equal volume of the deposit resides beneath two adjacent states and one side of the deposit contains more valuable hydrocarbons than the other, that side should be appropriately compensated in the allocation process. In structuring allocation agreements, information regarding deposit composition is critical.

Also, in the situation where offshore production platforms produce hydrocarbons from different deposits and commingle these fluids in a common pipeline for transport to a processing center and tanker loading terminal, it is critical to know both the amount of production and its composition to determine the proper allocation of value. After the hydrocarbons have been processed, a nation state's objective should be to receive the same value of products as the value of the raw hydrocarbons they put into the pipeline less, of course, any agreed upon losses.

The legal property issues associated with commingling are nonexistent if the allocation agreement is based upon value. In the end the

parties should find that the value taken out of the system is equal to the value put into the system, striking a value balance.

I. Maximizing Recovery of Hydrocarbons as a Function of Exploitation Methods Used

The percentage of recovery of hydrocarbons from the deposit is directly related to the exploitation methods used. Earlier we saw how unitization allowed strategic placement of wells based upon geological formation in order to maintain favorable reservoir characteristics for as long as possible. Also, producing from the reservoir at a rate that optimizes reservoir pressure allows maximum recovery over the life of the reservoir. However, maximum recovery may not be the result desired by some nation states. Sometimes developing nations are more concerned with the rapid production of cash to pay national debts than they are with maximizing recovery over the life of the reservoir. Prime examples of this practice are Iraq and Iran.

The most profitable situation for nation states would be to maximize the present value of all future income streams.¹⁷¹ Income streams will vary as a function of production rates. Production rates vary as a function of well-head pressure and well-head pressure will, in turn, affect total hydrocarbon recovery over the life of the reservoir. Thus, there is a delicate balance of producing enough oil and gas to satisfy current cash requirements while tempering that behavior with the knowledge that the deposit must be operated in a manner that will continue to supply specific future demand for cash. This disparity between the attitudes of nation states over cash flow can be a significant source of problems in joint ventures where each state operates its own production facility from the common deposit.

If we are to establish a legal duty toward operations, it must necessarily be linked with good faith efforts to conserve the resource, to minimize adverse impact to the environment, operate safely for all concerned, and consider the cash requirements of each state. How states choose to weigh these attributes depends on the specific circumstances of the situation.

171. This depends on many factors such as speculation on the future price of oil and a discount rate for calculating present value. Recognize, also, that maximizing the present value of future income streams from the deposit may require operation outside the envelope of prescribed operation in order to maintain other factors in line. For example, maximizing present value based on estimated future petroleum prices may require producing from the deposit at a rate that is not consistent with maximizing recovery nor may it even be consistent with existing legal requirements regarding wellhead operation.

J. A State's Liability to Adjacent States for Inefficient Recovery: International Claims for Damages

Lagoni suggests that if mining operations conducted on one side of the boundary were to cause material damage on the other side, the principle of territorial integrity would be violated.¹⁷² The rule that material damage to the territory of another state gives rise to state responsibility developed mainly with regard to extraterritorial environmental effects, especially air and water pollution. It appears, however, to be equally applicable to the extraterritorial effects of mining or extraction operations.¹⁷³ One possible type of resulting damage would be that other nation states would be unable to extract the minerals from their part of the deposit, even if the first state has extracted only that portion originally situated in its territory or continental shelf.¹⁷⁴ Another type of damage would be inefficient or wasteful exploitation which may sometimes be determined by "mass balances" over the system.¹⁷⁵ The theory behind the concept of the mass balance states that an operator should be able to account for the whereabouts of all hydrocarbons coming from the well-head on a daily basis.

IV. POLITICAL OBSTACLES TO EFFECTIVE MULTI-STATE MANAGEMENT OF TRANSBOUNDARY HYDROCARBON RESOURCES

A. Differing Perspectives on Natural Resource Management

1. Maximize Current Income or Maximize Total Value of Natural Resource Deposit?

As mentioned previously, sometimes a nation states' operations criteria are at odds with another's fiscal policies regarding natural resource deposits. One state may want to maximize current income and the other, with less need for current income, may want to maximize the total value of the resource. It seems the duty to conserve the resource deposit would imply a duty to maximize the total value of the deposit. Optimal recovery in a timely manner with regard for the environment and the minimization of waste would appear to play primary roles in determining the overall plan for exploiting the deposit.

172. Lagoni, *supra* note 1, at 217.

173. *Id.*

174. *Id.*

175. A mass balance is a mathematical engineering device which allows the engineer to ensure efficient recovery and to either predict and account for any losses.

It may be argued, however, that the degree of wealth of the nation state should play a part in the decision of how to exploit the deposit. In the Tunisia/Libya Continental Shelf case, the Court ruled that economic considerations cannot be taken into account in delimitation of the shelf and that they are extraneous circumstances and could easily change.¹⁷⁶ However, a state's current and future cash requirements may be valid criteria for use in proposing an equitable production plan after delimitation of the boundary is accomplished. Making a production plan requires the determination of how fast to exhibit the deposit. This will have a direct bearing on cash flow and ultimately the stability of the state's economy and the welfare of its people. If natural resources are considered a sovereign source of wealth, should not the state decide how best to exploit that wealth to meet its needs?

2. Joint Resource Development Versus Single State Development, Operational Control, and Resource Management

In joint development of natural resources in transboundary areas, there are as many alternatives as the mind can conceive. This endless array of possibilities should be tempered by the administrative requirements and equitable principles. As in the Australia/Indonesia dispute in the Timor Gap, the parties chose a three part temporary zone of cooperation in the disputed area, each with different legal and economic regimes governing them.¹⁷⁷ The possibilities of cooperative agreements are limited only by imagination, ingenuity, common sense, and the determination to achieve an equitable solution.

B. *What Price for Development?: The Environmental Pollution Issue*

The act of drilling for oil in the continental shelf necessitates considerable measures for pollution control. Upsetting the ecological and chemical balance of the region can have far reaching and serious consequences on marine life, the marine environment, and on nation states whose economies depend heavily on the fruits of the sea.

If the exploiting states through their negligence harm the marine environment, how and where will the harm manifest itself? What types of monitoring will be done to safeguard the environment and help to timely recognize changes and trends in quality of the environment? Where will

176. Case Concerning the Continental Shelf, 1982 I.C.J. 2 (Feb. 24), reprinted in 21 I.L.M. 225, 288 (1982).

177. Willheim, *supra* note 74, at 828.

the monitoring be done? How often and at what cost? Using what technologies? To what degree should the pollution from marine drilling activities be abated? Will this effort be a joint effort or will each nation state be responsible for its own pollution abatement activities? How will success of the pollution abatement activities be measured? What remedies are available to states who have suffered damages from the exploitation efforts?

These questions are easy to pose but much more difficult to answer. A full discussion of these issues could be the subject of a legal treatise and will not be dealt with here. Rather, these questions are meant to be thought provoking in a way that empowers the parties to answer them in the planning stages of the development rather than administering an ad hoc approach to pollution abatement.

C. Migration of Fluid Hydrocarbons Across State Borders - Whose Property?

The migratory properties of subsurface fluid hydrocarbons give nation states an incentive to unitize the development so that the deposit is treated as a whole for exploitation purposes. Then, optimal strategic well placement will maintain favorable reservoir characteristics and maximize recovery of hydrocarbons over the life of the deposit. One project operator can then be selected for the exploitation of the deposit which will avoid duplication of drilling, production, administrative activities, and associated costs.

Unitization also avoids the problems associated with property rights in migratory hydrocarbons. A state's share of the unitized production will be determined by the value of recoverable oil and gas in place beneath property for which that state has sovereign rights as a percentage of the value of the entire deposit. This is, by far, the best approach to take in terms of simplicity, cost effectiveness, maximization of hydrocarbon recovery from the deposit, and for the policy reason that it fosters an environment of cooperation between the parties.

V. EMERGING PRINCIPLES OF CONVENTIONAL LAW

A. *New Approaches to Drawing and Making Ocean Boundaries*

1. Multiple Boundary Regimes

The state practice of negotiating maritime boundary delimitation is a recent one and developing trends can be witnessed.¹⁷⁸ While the traditional political rationale of drawing a hard definitive boundary line served a purpose in the past, these hard lines have outlived their usefulness in today's global society. It may be more beneficial to enter into agreements where one of the adjacent nation states is responsible for exploration and exploitation of minerals of the continental shelf because of the overriding technological advantage that one state may have. On the other hand, it may be necessary to think of shelf delimitation not in terms of drawing one line, but rather in terms of drawing several lines to accomplish different objectives in the most cost efficient and environmentally sound manner that maximizes resource recovery. For example, the shelf boundary might be different for exploitation and management of fisheries than it would be for exploitation and management of minerals.¹⁷⁹

If the overall objective in these boundary regions is to maximize wealth,¹⁸⁰ minimize costs, minimize adverse effects on the environment, and maximize overall resource recovery over the life of the operation then extensive cooperation is needed between states.

2. Evolving Principles of Transboundary Hydrocarbon Resource Law and Trends in State Practice

There has been an evolution of the body of customary international law surrounding transboundary hydrocarbon resources, which is embodied in treaties. In 1979 a multinational team of experts in international law and geology met under the auspices of the School of Law and the Natural Resources Center of the University of New Mexico for the purpose of researching the international law applicable to the utilization and conservation of submarine transboundary hydrocarbon resources and to

178. Beauchamp, *supra* note 83, at 653.

179. *Id.*

180. I am speaking here of the time value of wealth. But this should be governed by any overriding concerns for minimizing costs, minimizing adverse effects to the environment, and maximizing resource recovery.

observe trends in that law.¹⁸¹ In preparing a draft treaty that could be used as a model for future treaties on transboundary hydrocarbon deposits they referred to numerous conventions and treaties on the subject. They put forth the following nine guiding principles in order to ensure proper coordination of these activities for the benefit and protection of the rights and interests of all concerned parties:

1. The duty of cooperation between the Parties to ensure the continued attainment of the purposes and objects of the Treaty;
2. The duty of good faith and good neighborliness of each of the Parties in the undertaking of their respective activities, in the mutual coordination of such activities and in the compliance with the guiding principles and criteria established pursuant to this Treaty;
3. The duty not to take advantage of or use their respective national laws and regulations and applicable rules of international law in such a way as would unnecessarily impede the equitable and reasonable utilization and distribution and conservation of transboundary hydrocarbon resources;
4. The duty of each of the Parties to abstain from undertaking activities within its jurisdiction or control that may cause damage to the resources or the environment of the other Party, or that may create an unreasonable risk in that respect;
5. The duty of the Parties to consult with each other on a continuing basis in order to secure the coordination of activities which is the main purpose and object of this Treaty;
6. The duty of each of the Parties to provide the other with prompt notification of its intention to undertake any activities relating to transboundary hydrocarbon deposits;
7. The duty of the Parties to exchange all information, data and publications relevant to maritime

181. See Szekely et al., *supra* note 4, at 609.

transboundary hydrocarbon deposits and the purposes and objectives of this Treaty. The use of proprietary information exchanged between the Parties shall be subject to the conditions of confidentiality established by the Party providing such information;

8. The duty of the Parties to cooperate with each other in order to prevent waste of maritime transboundary hydrocarbon resources and to prevent or abate environmental pollution or damage stemming from activities relating to maritime transboundary hydrocarbon deposits; and

9. The duty of the Parties not to undertake any unilateral or bilateral activities contrary to their obligations under international law, whenever a transboundary hydrocarbon deposit extends across their common maritime boundary, or extends into the subsoil of the seabed under the jurisdiction of a third State, or in the subsoil of the seabed and ocean floor beyond the limits of national jurisdiction.¹⁸²

VI. CONCLUSION

The business of producing oil and gas from the seabed floor is complicated enough without having to further confound the issue with transboundary deposits. However, as advances in technology promote a rush to explore the marine areas of the continental shelf and seabed of the high seas, we must be prepared to resolve the resulting legal, social, and economic issues. Not only must we pro-actively resolve existing disputes, we must search for consensus on how to manage the large, but ultimately limited, ocean resources.

As the socioeconomic needs of nation states evolve, so should our thinking about the payout that the act of drawing hard boundaries yields. Boundaries tend to isolate nations and individuals from the real issue of how nation states are going to inhabit this planet in meaningful way and in a spirit of trust and cooperation. If we must draw boundaries, let us draw boundaries that make sense for the function for which they were intended. For example, the boundary that makes sense for demarcation of the territorial continental shelf, may not make sense for fisheries management.

182. See Szekely et al., *supra* note 4, at 634-35.

We should be ready to apply sound judgment and equitable principles to address the needs of all parties concerned notwithstanding the obligation all nation states have regarding the ecology. The principles and duties of good faith, cooperation, unitization of the transboundary deposit, ecological interests, conservation of the resource, sharing of data, abstention from wasteful or uneconomic activities, and the desire to make joint efforts work will do more toward promoting a workable solution than any measure of scientific application of hard and fast rules.

However, we must recognize that we now understand some of the current and future issues of transboundary hydrocarbon deposits. We must be prepared to develop a regime of cooperation as a context for resolving disputes. Disputes happen most often because people do not listen to the needs of the other parties. States must listen for one another's needs and use the information to negotiate on a fair and equitable basis.

Based on what we know about transboundary hydrocarbon deposits today, we can accurately predict where the conflicts of tomorrow will be. We have a duty to plan the legal regime of transboundary natural resources with this foresight as a guide.