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The U.S.-Mexican Conflict Over Transboundary Groundwaters: Some Institutional and Political Considerations

by Stephen P. Mumme*

I. INTRODUCTION: THE NEED FOR A GROUNDWATER TREATY

Acknowledged in the International Boundary and Water Commission's (IBWC) Minute 242 in 1973,¹ groundwater has now become a major new issue on the agenda of U.S.-Mexican relations. While previous water resource conflicts centered on the apportionment and quality of the region's surface waters, this latest issue signifies a broadening of focus to encompass not only the major river systems, but underground waters as well. The new hydrological perspective reflects the increasing dependence on groundwaters on both sides of the border dictated by rapid agricultural and urban development. Mushrooming demand for water fosters the potential for conflict over transboundary groundwaters, which as yet are not governed by a common bilateral accord concerning their apportionment and regulation.

Currently, the dispute over groundwaters is most visible in the Arizona-Sonora border region near San Luis, Mexico. There, the pace of Mexican groundwater development intensified after 1962 with the diversion of drainage waters from the Wellton-Mohawk Irrigation Project near Yuma, Arizona into the Colorado River waters delivered to Mexico, producing severe salinization and consequent damage to Mexican agriculture.² The subsequent Mexican protest produced the deliberations leading to Minute 242, heralded as the "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River."³ However, a significant side effect of the prolonged negotiations was the deci-

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¹ IBWC Minute No. 242, Aug. 30, 1973, Mexico-United States, 24 U.S.T. 1971, T.I.A.S. No. 7708, established the legal basis on which the two nations sought to conclude nearly twenty years of controversy over the salinity of Colorado River waters delivered to Mexico under the provisions of the Treaty with Mexico Relating to the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, Mexico-United States, 59 Stat. 1223, T.S. No. 944 [hereinafter cited as Water Treaty of 1944].

² Furnish & Ladman, *The Colorado River Salinity Agreement of 1973 and the Mexicali Valley*, 15 NAT. RESOURCES J. 83, at 91-93 (1975).

³ IBWC Minute No. 242, *supra* note 1, at 1971.

sion by Mexican officials to construct a major well field adjacent to the border at San Luis, with the capacity to extract 160,000 acre feet of water annually, roughly one-tenth of the annual Mexican treaty allotment of Colorado River water.⁴ The scale of the Mexican project threatened a long-term drawdown of U.S. groundwater reserves. Prompted by fear of a possible pumping war between the two countries, Minute 242 sought to limit the annual withdrawals of each nation to a maximum level of 160,000 acre feet, acknowledging existing uses, and providing thereby a basis for the stabilization of the groundwater table in that area.⁵ The United States subsequently initiated a pumping project to extract 140,000 acre feet of water annually above its previous extractions within five miles of the international boundary, and began delivery of these waters to Mexico as part of the total amount committed by treaty.⁶

As an initial response to the groundwater problem, Minute 242 is conceived as a tentative and interim measure, "pending the conclusion of a comprehensive agreement on groundwater in the border area."⁷ The need for such a comprehensive treaty is defended on several grounds. Most cogent is the fact that groundwater conflicts either exist or loom on the horizon in six hydrological regions located throughout the length of the U.S.-Mexican border, which include the Colorado zone.⁸ The IBWC has already been involved with disputes in the Mexicali-Calexico and Yuha Desert basin vicinities of the two Californias, the San Luis-Yuma, Papago Wells, and Nogales vicinities along the Arizona-Sonora border, and the Ciudad Juarez-El Paso vicinity on the Texas-Chihuahua border.⁹ These conflicts vary according to the type of water use and the characteristics of the aquifer in the locality. Short of a politically comprehensive solution, however, they will continue to exacerbate U.S.-Mexican relations for the foreseeable future.¹⁰

In addition to the political advantages of a comprehensive treaty,

⁴ Bradley & DeCook, *Ground Water Occurrence and Utilization in the Arizona-Sonora Border Region*, 18 NAT. RESOURCES J. 29, at 36-39 (1978).

⁵ IBWC Minute No. 242, *supra* note 1, at 1971.

⁶ Holburt, *International Problems*, in VALUES AND CHOICES IN THE DEVELOPMENT OF THE COLORADO RIVER BASIN 233 (D. Peterson & A. Crawford eds. 1978).

⁷ IBWC Minute No. 242, *supra* note 1, at 1975.

⁸ Bittinger, *Survey of Interstate and International Aquifer Problems*, GROUND WATER, March-April, 1972, at 46.

⁹ Burman & Cornish, *Needed: A Ground-Water Treaty Between the United States and Mexico*, 15 NAT. RESOURCES J. 385, at 388-95 (1975); Keith, *The Impact of Ground-water Development in Arid Lands: A Literature Review and Annotated Bibliography*, 10 OFFICE OF ARID LANDS 12-16 (1977) (Resource Information Paper, U. of Ariz.).

¹⁰ Utton, *Water Problems and Issues Affecting United States-Mexico Relations: Policy Options and Alternatives* 9 (1978) (monograph, The U. of New Mexico School of Law, The Natural Resources Center); Teclaff & Teclaff, *Transboundary Ground Water Pollution: Survey and Trends in Treaty Law*, 19 NAT. RESOURCES J. 629, at 666-67 (1979).

there are legal and institutional reasons for advancing such a solution. At present, for instance, the administrative agency responsible for managing the current water treaties and conventions between the two nations, the IBWC, is formally unable to manage the groundwater situation in the absence of a treaty extending and defining its jurisdiction in relation to groundwaters.¹¹

Finally, there are sound environmental and hydrological reasons for pursuing a comprehensive settlement of the groundwater problem. The control of water related activities which threaten or actually contaminate groundwater reservoirs is currently a question of great relevance to the transfrontier area. The growing awareness of the threat of pollution, as well as the problem of overdrafts of groundwater in excess of natural recharge, has prompted a recognition of the integral relation between surface and subsurface waters and the necessity of managing the whole hydrological cycle in order to obtain an optimal utilization of available waters. Such considerations point to the need for an integrated management approach to transfrontier waters in order to conserve and protect the quantity and the quality of existing resources.

The opportunity for realizing such a comprehensive treaty is handicapped, however, by a number of institutional and political obstacles. Foremost among these problems are the lack of precedent in international law for establishing an integrated management regime with respect to transfrontier groundwaters, the character of the IBWC as the principal institution involved in the administration of transboundary water resources, and various aspects of the political environment which may impinge upon the settlement of the groundwater controversy.

This paper surveys the institutional and political problems which affect the prospects for a comprehensive agreement on groundwaters. The principal alternatives currently advanced for the management of transboundary groundwaters are reviewed, with special emphasis placed upon the structure and role of the IBWC in the management of boundary and water conflicts. In addition, the political context of U.S.-Mexican water resource relations is outlined, with a view towards understanding some of the more important domestic, bilateral, and water resource issues affecting the groundwater controversy. While the paper does not set out definitive conclusions, a tentative prognosis for the management of transfrontier groundwaters is advanced in the concluding remarks.

II. TRANSBOUNDARY GROUNDWATER MANAGEMENT: ISSUES AND ALTERNATIVES

Observers of the groundwater situation, and of U.S.-Mexican rela-

¹¹ Burman and Cornish, *supra* note 9, at 400.

tions generally, concur that a treaty is necessary to avert further conflict over groundwater and insure its rational, efficient, and equitable use in the borderlands. But few precedents guide diplomacy.¹² A belated awareness of the interdependence of hydrological systems and a preoccupation with surface waters is evident in the paucity of international law applicable to transboundary groundwater conflicts.¹³ Aside from Minute 242, the Warsaw Agreement between Poland and the U.S.S.R. (1964) and several similar agreements elsewhere refer to groundwater indirectly within the context of general agreements on water use in frontier regions.¹⁴ Some development of international law also pertains to the allocation of trans-frontier petroleum deposits, with analogical relevance for the case of groundwaters.¹⁵

Apart from extant international law, recent prescriptions by professional bodies have contributed to the development of legal theory applicable to transfrontier groundwaters. The rules adopted by the International Law Association meeting at Helsinki in 1966, for example, explicitly recognize the interdependence of surface and ground water and call for the recognition of the concept of an *international drainage basin*.¹⁶ This concept implicitly promotes the need for integrated water management of frontier drainage basins, and has relevance for the U.S.-Mexican case.¹⁷ It has been observed, however, that "drainage basins do not always overlap individual groundwater systems," thereby limiting the utility of the concept for the range of international groundwater situations.¹⁸ It is presently difficult to substantiate the concept's applicability in this case pending extensive study of the groundwater hydrology throughout the U.S.-Mexican frontier.

The lack of precedent in international law, and what has been referred to as an anarchical legal and administrative situation in the United States and Mexico,¹⁹ suggest that the development of a groundwater treaty will require substantial institutional innovation. A comprehensive treaty should encompass the allocation of groundwaters (to include those

¹² *Id.* at 386, 397.

¹³ Hayton, *The Ground Water Legal Regime as Instrument of Policy Objectives and Management Requirements*, 2 *ANNALES JURIS AQUARUM* 273, at 275 (1976); Caponera and Alh eriti re, *Principles for International Ground-Water Law (I)*, 2 *NAT. RESOURCES F.* 279, at 280 (1978).

¹⁴ *Id.* at 281-282; Utton, *International Groundwater Management: The Case of the U.S.-Mexican Frontier*, 57 *NEB. L. REV.* 633, at 635-36 (1978).

¹⁵ Onorato, *Apportionment of an International Common Petroleum Deposit*, 17 *INT'L & COMP. L. Q.* 85, at 92-93 (1968); for discussion see Utton, *supra* note 14, at 644-45.

¹⁶ Caponera and Alh eriti re, *supra* note 13, at 281.

¹⁷ Bradley and DeCook, *supra* note 4, at 42.

¹⁸ Caponera and Alh eriti re, *supra* note 13, at 281.

¹⁹ Utton, *supra* note 14, at 633-34.

defined as underground streams), the regulation of groundwater pollution (to include remedial procedures and sanctions), a program of rational management (to include the detection and determination of groundwater deposits), the measurement and regulation of extraction and use, the monitoring of aquifer recharge, penalties and remedies for abuse of water usage, and a program for the short and long term development of waters corresponding to the community requirements and ecological limitations of both nations in the border region.²⁰ The attainment of an agreement even modestly approaching these goals must surmount longstanding doctrines and dearly held attitudes concerning water appropriation and use in the borderlands, in the U.S. as well as Mexico. Moreover, such an agreement must negotiate the state level system of statute law governing water use in the United States, an obstacle which has caused some analysts to speculate whether a comprehensive treaty is juridically feasible.²¹

With the object of reconciling the conflict between hydrological interdependence and national sovereignty, several institutional options have been advanced as alternatives to the status quo. Professor Albert E. Utton has summarized these approaches to the management of U.S.-Mexican groundwaters, to include:²²

1. *The Correlative Rights Approach.* This approach would apply the legal doctrine of correlative rights to the rationing of transboundary groundwaters. The IBWC, or some other international agency, would administer the doctrine embodied in treaty through judicial processes, drawing upon its technical capability to arrive at a determination in each case under review.

2. *Management:*

A. *Equitable Apportionment.* This approach would grant the IBWC authority over transboundary groundwater, the authority to conduct the technical investigations requisite to making authoritative determinations with respect to apportionment of transboundary groundwaters, the mandate to identify and define transboundary groundwater aquifers, and the authority to manage each aquifer in accordance with its physical characteristics to preserve the resources of the aquifer and prevent its exhaustion. Various formulas for apportionment might be adopted.

B. *Case by Case Negotiation.* This approach anticipates that a comprehensive agreement may be unobtainable. Accordingly, individual treaties, or minutes, might be adopted for particular transboundary aquifers as conflicts arose. The IBWC would function in an advisory and brokerage

²⁰ Most of these principles are summarized as general precepts of rational groundwater management by Clark, *Institutional Alternatives for Managing Groundwater Resources: Notes for a Proposal*, 18 NAT. RESOURCES J. 153, at 158-60 (1978).

²¹ Hayton, *Institutional Alternatives for Mexico-U.S. Groundwater Management*, 18 NAT. RESOURCES J. 163, at 202-03 (1978).

²² Utton, *supra* note 14, at 640-51.

capacity, subsequently administering each agreement according to the specifications provided therein.

C. *Comprehensive Management*. This approach would "give the IBWC the complete spectrum of administrative powers from investigative and planning to rule making and enforcement. This would put it not only into the investigative, engineering, and planning functions, but also into the regulatory and enforcement end of the administrative process." It generally conceives of the IBWC as assuming *supra-natural* administrative powers.

3. *International Litigation*. Anticipates that a solution to the groundwater conflict, either comprehensive, or in part, might not be achievable on a bilateral basis, requiring its settlement in the International Court of Justice or some other arbitral tribunal.

In all but the last case the IBWC figures prominently in each of the several options which might be pursued. Indeed, it is fair to say that the proposals advanced promote the development of the Commission's jurisdiction and functions. Its unique charter as a permanent bilateral commission between the United States and Mexico, and a long history of settling land and water conflicts between those nations, make the IBWC the major institutional actor involved in the development of a solution. A consideration of its present mandate and role is essential in order to understand the institutional and political context affecting the prospects for finding a comprehensive solution to the groundwater controversy.

III. THE IBWC: INSTITUTIONAL CONSIDERATIONS

Although the IBWC is not exclusive in the management of U.S.-Mexican boundary problems, its jurisdictional powers and functions make it predominant in the field of water resources.²³ Established in 1889 for the purpose of adjusting land and river boundary disputes, the original International Boundary Commission (IBC) gradually developed the range of its functions along the international boundary.²⁴ From its original and narrow jurisdiction specific to boundary adjustments, the IBC, in conjunction with the interim International Water Commission, undertook the development and management of water storage, diversion, flood control, and channel rectification projects. This functional evolution culminated in its re-construction as the IBWC in 1944.²⁵ In its extant form the scope of the IBWC's jurisdiction is limited to the international

²³ Jamail & Ullery, *International Water Use Relations Along the Sonoran Desert Borderlands*, 14 OFFICE OF ARID LANDS 16-17 (1979) (Resource Information Paper, U. of Ariz.).

²⁴ Timm, *Some Observations on the Nature and Work of the International Boundary Commission, United States and Mexico*, 15 Sw. Soc. Sci. Q. 1, at 17-18 (1935).

²⁵ Herrera Jordán & Friedkin, *The International Boundary and Water Commission, United States and Mexico*, 5 INT'L CONF. ON WATER FOR PEACE 192 (1967).

boundary, including the limitrophe sections of the Rio Grande and Colorado rivers, and to those "acts needed for coordination of the two Governments' plans for works along the boundary to safeguard their respective rights, and to enable each to obtain benefits that could not be achieved by unilateral action."²⁶ Its various functions have expanded to incorporate sewage and sanitation control projects of a bi-national nature, hydroelectric production, and salinity control projects on the international rivers within its jurisdiction.²⁷

The capacity of the Commission to settle problems along the frontier stems from its special character as an international commission, and, in effect, a narrow construction of its functional competence. Under Article 2 of the Water Treaty of 1944, the IBWC is to consist of both U.S. and Mexican Sections, each Section headed by an Engineer-Commissioner.²⁸ The respective commissioners and their supporting staffs (each including two principal engineers, a legal advisor, and secretary) comprise the formal commission and are accorded full diplomatic status.²⁹ Headquartered in the adjoining cities of El Paso, Texas and Juarez, Chihuahua, the Commission maintains field offices in those border cities close to the various problem areas requiring its supervision.³⁰

Both the activities and proximity of the respective sections facilitate the implementation of the Commission's duties. Located only a couple miles apart, the Commissioners and their staffs engage in numerous regular transactions, formal and informal. Ordinarily, the two commissioners meet once or twice a week to deal with routine matters, more frequently if extraordinary problems are concerned.³¹ The frequent interchange among the personnel of each section fosters a pragmatic and intimate style of operation, with corresponding norms of confidentiality, informality, and mutual access contributing to the effective performance of its functions. The commissioners' longevity of tenure reinforce the IBWC's operational norms.³²

²⁶ *Id.* at 192-93.

²⁷ Jurisdiction and Functions of the International Boundary and Water Commission 16-23 (IBWC document, Special Collections, University of Texas at El Paso, No. ACC 581, Item 2, Nov. 26, 1975)[hereinafter cited as IBWC Jurisdiction].

²⁸ Water Treaty of 1944, *supra* note 1, art. II, at 1249. The Mexican Section is frequently referred to by the Joint Commission's Mexican title, Comisión Internacional de Límites y Aguas (CILA). For convenience the Joint Commission has been referred to as the IBWC, with each Section identified by national jurisdiction.

²⁹ IBWC Jurisdiction, *supra* note 27, at 4.

³⁰ Herrera Jordán & Friedkin, *supra* note 25, at 193.

³¹ *Id.*

³² The present U.S. Commissioner, the Honorable Joseph F. Friedkin, has been with the Commission for forty years, seventeen of those as Commissioner. The former Mexican incumbent, Honorable David Herrera Jordán, held the post of Commissioner for thirty-two years before his retirement in 1979. His successor, Honorable Joaquín C. Bustamante, has

These stylistic aspects of the Commission's operation are essential to its conflict management role. The IBWC is able to respond flexibly to problem situations, to bypass formal diplomatic channels and protocol in conducting certain of its investigations, to maintain a common basis of understanding—especially concerning the role of the Commission and matters of treaty interpretation—and to avoid many of the cultural and political pitfalls which might otherwise complicate bilateral relations concerning boundary and water matters.³³

The performance of the Commission is also attributable to the way its functions are defined. In its bilateral capacity, the principal functions of the Commission are those of liason, adjudication, and administration.³⁴ The liason activities of the Commission are perhaps the most crucial of its day to day functions in the field. The present American and former Mexican commissioners, Friedkin and Herrera Jordan observe:

The heads of the field offices of a Section maintain a constant and courteous exchange of information with the corresponding heads of the field offices of the other Section of the Commission, through reciprocal visits, telephone calls, and the joint conduct of inspections of different parts of the boundary. This practice allows the forwarding of timely information to their respective Commissioners concerning the initiation and evolution of the great majority of international questions, and on their own initiative to take prompt corrective measures in numerous minor matters.³⁵

Regular and frequent interchanges thus enable the Commission to antici-

been with the Commission for fifty-five years. These figures are extrapolated from *Rio Grande Water for Peace*, ENGINEERING NEWS-REC., July 27, 1967 at 35-36, col. 2; see also Timm, *supra* note 24, at 11-13.

³³ Herrera Jordán & Friedkin, *supra* note 25, at 193.

³⁴ The liason functions of the Commission are derived from its formal powers as specified in Article 24 of the Water Treaty of 1944. Section A of Article 24 requires the Commission to "initiate and carry on investigations and develop plans for the works which are to be constructed or established in accordance with the provisions of this and other treaties . . .," while Section E of the same article requires the Commission "[T]o furnish the information requested of the Commissioners jointly by the two Governments on matters within their jurisdiction." Further, Section G of Article 24 mandates that "[T]he Commission shall submit annually a joint report to the two Governments on matters in its charge."

The Commission's powers to adjudicate derive principally from Section D of Article 24 which requires the Commission "[T]o settle all differences that may arise between the two Governments with respect to the interpretation and application of this treaty, subject to the approval of the two Governments."

The administrative powers of the Commission include all matters related to the implementation of its mandate by treaty. Section C of Article 24 mandates the IBWC ". . . to exercise and discharge the specific powers and duties entrusted to the Commission by this and other treaties and to carry into execution and prevent the violation of the provisions of those treaties and agreements." See Water Treaty of 1944, art. XXIV, *supra* note 1, at 1255; reprinted in IBWC Jurisdiction, *supra* note 27, at 5-6.

³⁵ Herrera Jordán & Friedkin, *supra* note 25, at 193.

pate potential difficulties and defuse them before they become severe.

The juridical functions of the Commission are set out in Article 24 of the 1944 treaty.³⁶ The treaty authorizes the Commission "to settle all differences that may arise between the two Governments."³⁷ The Commission may hold hearings at its discretion, summon witnesses, and otherwise conduct itself as an international tribunal in matters within its jurisdiction,³⁸ although its decisions are subject to the ratification of the respective governments.³⁹ In its administrative capacity, the Commission oversees the various works (e.g., dams, diversion projects, gauging stations, salinity control projects) under its authority and, importantly, conducts investigations and technical studies pertinent to its ongoing and evolving functions.⁴⁰

The policymaking functions of the Commission, though not insignificant, are limited by the subordinate status of each national section in relation to its government and by its own procedural norms. Individually, each section has a separate jurisdiction exclusive to its national domain in addition to its jurisdiction in common when convening as a whole.⁴¹ In its joint capacity, all acts, as seen above, are subject to the review and ratification of its member governments. Nevertheless, the Commission as a whole has substantial discretion to determine the legitimacy of a problem under its jurisdiction and, in practice, the activities and recommendations of the Commission are seldom overturned by the two governments.⁴²

As previously noted, however, the Commission is narrowly restricted in its geographic jurisdiction. Furthermore, the Commission has been historically reluctant to involve itself in policymaking, preferring to avoid controversy.⁴³ The Commission regards itself basically as the problem oriented instrument of its sovereign members, not as the actual source of policy. Where particularly controversial matters, such as the longstanding dispute over the Chamizal tract, have reached the agenda of the Commission, it has, according to one authority, "simply avoid[ed] the subject and direct[ed] [its] energies toward some constructive work in which both

³⁶ Water Treaty of 1944, art. XXIV, *supra* note 1, at 1255.

³⁷ *Id.*

³⁸ Timm, *supra* note 24, at 22-23.

³⁹ Water Treaty of 1944, art. XXIV, *supra* note 1, at 1255.

⁴⁰ Friedkin, *History and Functions of Joint Mexican-American Public Bodies Regulating and Allocating Water Resources Along the Rio Grande (Bravo)*, in *INTERNATIONAL WATER LAW ALONG THE MEXICAN-AMERICAN BORDER* 1, 4-5 (C. Knowlton ed. 1968).

⁴¹ Utton, *International Streams and Lakes*, in 2 *WATER AND WATER RIGHTS* 491 (R. Clark ed. 1967).

⁴² The discretionary powers of the Commission through 1941 are discussed in TIMM, *THE INTERNATIONAL BOUNDARY COMMISSION, UNITED STATES AND MEXICO* 69 (1941); see also Timm, *supra* note 24, at 25. On the contemporary Commission, see Jamail and Ullery, *supra* note 23, at 17.

⁴³ Timm, *supra* note 24, at 27.

states have a vital interest. . . ."⁴⁴ As illustrated by the Chamizal case and the more recent Colorado salinity dispute, the settlement of such controversial issues has eventually required ministerial level negotiations between the U.S. Department of State and the Mexican Ministry of Foreign Relations.⁴⁵

Its emphasis on "some constructive work" underlines the fundamental orientation of the Commission. Originally a survey agency, the Commission's de facto authority rests on its reputation as a corps of engineers whose principal functions are still those of providing technical information and advice to its member governments.⁴⁶ While this view of the Commission is idealized, in fact, its predominant activities closely fit the image.

Within its jurisdiction, the Commission prefers to limit itself to problems admitting a technical solution. Both in its selection of priorities and in rules of evidence in adjudicating conflicts, the IBWC gives preference to technical data.⁴⁷ The Commission's approach is consistent with its mandate as well as its competence and physical resources.⁴⁸ Although it has limited itself to largely technical concerns, this narrow construction of its own competence has generally strengthened its reputation as a professional advisory body able to render impartial judgments and act as a neutral third party in bilateral boundary and water disputes.⁴⁹

These institutional features of the Commission have several implications for its ability to move towards a comprehensive solution to the groundwater conflict. As seen above, the jurisdiction of the IBWC is specific to surface waters. The Commission yet lacks firm statutory authority to manage the groundwater conflict along the border. To the extent that it is presently so doing, its actions are pursuant to the language of Minute 242, Articles 5 and 6, which restrict its functions to the San Luis-Yuma conflict zone, while anticipating the negotiation of a comprehensive

⁴⁴ *Id.*

⁴⁵ The involvement of the Commission in both cases mentioned is given a general treatment in Sepulveda, *Implications for the Future: Design of Viable International Institutions*, 15 NAT. RESOURCES J. 215 (1975).

⁴⁶ *Id.* at 219-20.

⁴⁷ *Id.*; Timm, *supra* note 24, at 24.

⁴⁸ The personnel of the Joint Commission number approximately 400, 300 of whom are employees of the U.S. Section, 100 of whom are employees of the Mexican Section. Differences in size are attributable to the different national functions of each Section. The U.S. Section maintains functional jurisdiction over certain construction projects, while the Mexican Section does not maintain a division of construction, that task being mandated to the Mexican Secretariat of Agriculture and Water Resources. The majority of the personnel consist of engineers, construction and technical support personnel, legal staff, and clerical personnel. See Day, *International Management of the Rio Grande Basin, The United States and Mexico*, 8 WATER RESOURCES BULL. 937 (1972).

⁴⁹ Sepulveda, *supra* note 45, at 219.

treaty, and pledging the Commission to continue its customary consultative functions.⁵⁰ At present, the operational activities of the Commission entail aerial surveillance of extant and potential zones of groundwater conflict and the exchange of relevant hydrological data.⁵¹

The IBWC's present mandate, however, remains unclear. While its minutes have the legal standing of an executive agreement when ratified by both nations,⁵² they are not equivalent in international law to a formal treaty.⁵³ Where the Commission's minutes, or parts thereof, lack a concrete basis in statute, as is the case with transboundary groundwaters, they may be liable to legal challenge.⁵⁴ Furthermore, Minute 242's provisional language concerning groundwater may be interpreted to qualify its binding authority insofar as it signifies the need for a comprehensive treaty to settle definitively the groundwater problem.⁵⁵ Finally, the tasks of the Commission itself are left unspecified and, hence, open to interpretation. Under these circumstances, the Commission cannot undertake any act of regulation or adjudication without the initial concurrence of its member governments.⁵⁶

Of further significance, the evolution of the IBWC's jurisdiction and powers in the sphere of groundwater management is affected by its reluctance to involve itself in controversial questions of policy.⁵⁷ So far the Commission has concerned itself with fact finding and liaison activities and otherwise refrained from advancing any particular management solution to the groundwater problem.⁵⁸ Its posture as a disinterested and neutral party is wholly consistent with its previous approach to controversial issues. It has avoided conflict rather than attempting to manage it when the problem was not consistent with either its functional mandate or

⁵⁰ IBWC Minute No. 242, *supra* note 1, at 1975.

⁵¹ Utton, *supra* note 14, at 646.

⁵² Sepulveda, *Mexican-American International Water Quality Problems: Prospects and Perspectives*, in *POLLUTION AND INTERNATIONAL BOUNDARIES* 15 (A. Utton ed. 1973).

⁵³ See G. VON GLAHN, *LAW AMONG NATIONS* 422-23 (1976).

⁵⁴ See Holburt, *supra* note 6, at 233-34.

⁵⁵ State Department Circular No. 175, of December 13, 1955, specifies that "Executive agreements shall not be used when the subject matter should be covered by a treaty." Since IBWC Minute No. 242, *supra* note 1, explicitly states the need for a treaty, it is reasonable to deduce that it cannot have the status of an executive agreement in its provisions concerning groundwater. See Dep't of State Circular No. 175, Dec. 13, 1955, *printed in* 50 *AM. J. INT'L L.* 784, 785 (1956).

⁵⁶ Under Article 24, Section D, of the 1944 treaty, where the Commissioners are not formally in agreement, "they shall so inform their respective governments reporting their respective opinions and the grounds therefor and the points upon which they differ, for discussion and adjustment of the difference through diplomatic channels. . . ." *Water Treaty of 1944*, art. XXIV, *supra* note 28, at 1255.

⁵⁷ Jamail & Ullery, *supra* note 23, at 17-18.

⁵⁸ Utton, *supra* note 14, at 635-36.

practical competence.

Nevertheless, the IBWC is itself an important leverage point in the development of international boundary and water policy, arguably the singlemost influential of the various interested actors. Though its separate sections must act as agents of their governments, the Commission as a whole is capable of representing a definite interest emanating from its technical expertise, intimate knowledge of the frontier, and past accomplishments in settling boundary and water disputes.⁵⁹ As others have noted, the Commission is ideally situated to promote the rational management and husbanding of groundwater resources in the borderlands, and is, at the moment, the only institution on the border with a truly regional orientation.⁶⁰

The groundwater conflict thus affords the Commission a unique opportunity to innovate in the furtherance of its functional competence in the borderlands. It also points to what is, in effect, a major conflict of roles within the IBWC; that is, between its special regional orientation, interest, and expertise which enable it, acting as a whole, to act as an advocate of the rational management and conservation of transboundary resources, and its ordinary role as a brokerage agency between the United States and Mexico. Under its present mandate, however, its capacity to act as a regional advocate diminishes in inverse relation to the political controversy generated by an issue on its agenda. The opportunity for the Commission to lend its influence and prestige to a comprehensive settlement of the groundwater dispute is apt to be circumscribed by political forces which condition the general climate of bilateral relations, particularly U.S.-Mexican water relations.

⁵⁹ Sepulveda argues that the Commission affords an essentially apolitical perspective on boundary and water problems and, hence, constitutes a *third way* above national interest for resolving these disputes. See Sepulveda, *supra* note 45, at 219.

⁶⁰ While there are presently as many as eight U.S.-Mexican commissions operating in various spheres along the border, the IBWC is the only one of these with permanent status under treaty and independent powers to regulate and adjudicate within its sphere of competence. The recent prisoner exchange treaty in 1977 establishes an ongoing review process with respect to the status of nationals of each country held within the other's jurisdiction. The review commission does not, however, have the range of standing powers to compare with the IBWC. Rather, it functions more as a consultative body dependent on normal diplomatic channels. Furthermore, its effectiveness has yet to be fully proven; many legal snags have yet to be tested. See Meyer, *Mexican Transfer*, HARPER'S, Nov. 1977, at 26. Among those pointing to the uniqueness of the Commission and its potential as a management agency are, Day, *International Aquifer Management: The Hueco Bolson on the Rio Grande River*, 18 NAT. RESOURCES J. 163, 179 (1978); Clark, *supra* note 20, at 155, 158; Dworsky, *The Management of Water-Land-Environmental Resources at International Boundary Regions*, 18 NAT. RESOURCES J. 143, 146-47 (1978).

IV. THE GROUNDWATER CONFLICT: POLITICAL CONSIDERATIONS

Despite the many complex problems linking the two nations across their common boundary, only in the area of water and boundary, and water related problems, have institutionalized measures for preventive and remedial actions been adopted. In no small measure the Commission's performance may be credited for this achievement.⁶¹ Nevertheless, relations between two sovereign nations remain fundamentally political, particularly where strategic natural resources are involved. Differences in national systems of water administration, changing patterns in bilateral relations, and fresh issues related to transnational water resources are some of the political forces worthy of note which may influence the resolution of the groundwater issue.

A. *Water Administration: Mexico and the United States*

The urgency of the groundwater problem is the result of developmental patterns on both sides of the boundary which have fully committed, even overcommitted, available surface supplies in the Rio Grande and Colorado river basins.⁶² Until recently, there has been little deliberate planning and administration of groundwater on either side of the border.⁶³ To view the administrative setting as wholly anarchical, however, obscures the actual situation as much as it faults the want of a rational management approach to groundwater appropriation along the border. Rather, fundamental differences characterize the administrative capabilities of each nation with respect to groundwaters bearing upon the present groundwater situation.

The principal differences between the two systems of water administration reflect the structural decentralization and centralization which distinguish the two political systems. The federal distribution of sovereignty in the United States is evident in state jurisdiction over water resources. This decentralized system of water law and administration admits the federal government only through the powers to regulate navigable inter-state rivers, authority to regulate commerce, federal reclamation law, and recent statutes regulating environmental quality.⁶⁴ Historically, the differing systems of state water law and the haphazard pattern of federal regulation have frustrated systematic administration of

⁶¹ A plethora of institutional ties exist between the two nations, yet as Jamail and Ulery note, *supra* note 23, at 10, the IBWC is the only *bi-national* institution among them.

⁶² Ingram & McCain, *Distributive Politics Reconsidered—The Wisdom of the Western Water Ethic in the Contemporary Energy Context*, 7 POL'Y STUD. J. 49, 50 (1978).

⁶³ Utton, *supra* note 14, at 633.

⁶⁴ For a general overview of the federal government's involvement in water resources management, see STAFF OF SENATE COMM. ON INTERIOR AND INSULAR AFFAIRS, 93d CONG., 1ST SESS., REPORT ON HISTORY OF FEDERAL ENERGY ORGANIZATION 13-25 (Comm. Print 1973).

water resources at the national level.⁶⁵ Of the four states contiguous to the U.S.-Mexican border, each maintains a different system of water law and administration.⁶⁶ Only New Mexico presently provides for the regulation of groundwater mining; the rest lack specific provisions in law to control groundwater extraction, and, in their absence, rely on their respective doctrines of water law as interpreted by the courts on a case by case basis to resolve conflicts over groundwater utilization.⁶⁷

The Mexican system, though constitutionally federal, is highly centralized in practice. In contrast to the legal structure of the United States, it provides a firm basis in law for the administration of water resources, to include groundwaters.⁶⁸ Article 27 of the Mexican Constitution vests all subsoil and mineral rights in the state.⁶⁹ It is elaborated by the 1934 National Waters Act which specifies clearly the priority whereby water is to be utilized. In essence, the 1934 Act constitutes a national plan for water resources.⁷⁰ Moreover, the 1947 Health Engineering Act invests the central government with the exclusive power to plan and operate water delivery systems throughout the nation.⁷¹ Under these statutes, and under the 1956 Law of Groundwaters, the government has established a system of restricted zones and a permit system to regulate the development of groundwaters.⁷² Presently limited in scope, the system could be extended in accordance with national policy objectives. In further contrast to the U.S. system of water management, the administration of national water resources is virtually the province of a single government ministry, the Secretariat of Agriculture and Water Resources (SARH).⁷³ It is significant not only that SARH acts as a super agency in the sphere of water management, but that it has recently demonstrated a special concern with groundwater development and administration nationwide and in the borderlands.⁷⁴

⁶⁵ Ingram & McCain, *Federal Water Resources Management: The Administrative Setting*, 37 PUB. AD. REV. 448, 449 (1977).

⁶⁶ Clark, *The Role of State Legislation in Ground Water Management*, 10 CREIGHTON L. REV. 469, 472-74 (1977).

⁶⁷ For discussion, see *id.* at 469-74.

⁶⁸ Utton, *supra* note 14, at 633-34.

⁶⁹ CONSTITUCIÓN art. 27, para. 1 (Mex.).

⁷⁰ Orive, *Water Resources Administration in Mexico*, in NAT'L SYS. OF WATER AD. 150 U.N. Doc. ST/ESA/17 (A. Lepawsky ed. 1974).

⁷¹ *Id.*; Langone, *Evolution of Mexican Water Law*, in INTERNATIONAL WATER LAW ALONG THE MEXICAN-AMERICAN BORDER 37-39 (C. Knowlton ed. 1968); Bath, *A Review of Mexico's Water Policy*, 1978 PROC. ROCKY MTN. COUNCIL LATIN AM. STUD. 20; Anaya, *Mexico and its Water Resources Policy*, 8 INT'L CONF. ON WATER FOR PEACE 682, 683-84 (1967).

⁷² Langone, *supra* note 71, at 38-39.

⁷³ Mumme, *U.S.-Mexican Groundwater Problems: Bilateral Prospects and Implications*, 22 J. INTERAM. STUD. & WORLD AFF. 31, 41-42 (1980).

⁷⁴ See COMISIÓN DEL PLAN NACIONAL HIDRÁULICO, INVENTARIO REGIONAL DE AGUAS SUB-

These differences in domestic systems of water administration impact on the groundwater conflict by shaping the way each nation is likely to view groundwater in relation to its current developmental requirements in the borderlands, as well as the way in which each nation is likely to approach the other on the groundwater question in bilateral relations. With respect to the matter of developmental perspective, it is important to note that Mexican agricultural and urban development in the borderlands historically lagged behind the United States.⁷⁵ The earlier U.S. development of the rich Yuma and Imperial valleys, for instance, gave it a superior claim to the surface waters of the Colorado, recognized in the 1944 treaty.⁷⁶ The subsequent expansion of Mexican agriculture in the Colorado delta, therefore, became more heavily reliant upon groundwater as a supplement to the fixed surface reserve than did agriculture in the United States.⁷⁷ Today, well over one-third of the Mexican waters utilized in the area derive from ground sources, compared to only one-tenth for the United States.⁷⁸ While exact figures are lacking for the upper Rio Grande, Mexican agriculture in that region is likewise more heavily invested in groundwater development than is agriculture on the U.S. side of the border.⁷⁹

The importance of groundwater to the Mexican border economy, particularly agriculture, and the concomitant importance of the regional economy to the Mexican nation at large, suggest that the strategic significance of the development of groundwater resources in the area may loom much larger from the Mexican perspective than from that of the United States. That this is the case is evident in the recent large scale pumping programs initiated by the Mexican government in the region, in addition to—though not so threatening to the United States—those works located at San Luis.⁸⁰ The evidence suggests the Mexican planners, endowed with the legal and administrative resources to pursue a rational strategy of groundwater development, will seek to take full advantage of the resource

TERRANEAS 18, 106-07 (1977); M. GREENBERG, BUREAUCRACY AND DEVELOPMENT: A MEXICAN CASE STUDY 41, 54-55 (1970).

⁷⁵ N. HUNDLEY, DIVIDING THE WATERS 52-56 (1966); see also C. TIMM, THE INTERNATIONAL BOUNDARY COMMISSION, UNITED STATES AND MEXICO 201-04 (1941).

⁷⁶ HUNDLEY, *supra* note 75, at 126-28, 132-35.

⁷⁷ Bradley & Emel, *International Ground-Water Use Across the Arizona-Mexican Border: Problems of Hydrology, Management and Law* 6, 7, 12 (1978) (unpublished monograph in University of Arizona Department of Hydrology).

⁷⁸ *Id.* at 12.

⁷⁹ Current developments portend a sixty percent expansion in irrigated acreage in the Juárez valley, most of that to be derived from further groundwater development. See Day, *supra* note 60, at 173-74.

⁸⁰ See *Economic and Social Conditions in Mexico*, 25 COMERCIO EXTERIOR 12 (1979); *Mexico Heads for Serious Food Shortage*, 1 LATIN AM. COMMODITY REP. 147 (1978); Day, *supra* note 60, at 173-74.

to promote the economic strength and growth of their border economy.⁸¹ The United States, on the other hand, is far less dependent on groundwater, and administratively less capable of undertaking a systematic program of groundwater exploitation at present than is Mexico.⁸²

Concerning their international relations, the policy differences between the two systems reinforce distinctive tendencies in U.S.-Mexican approaches to boundary and water conflicts. The centralized objectives of the Mexican system can be more easily represented in bilateral relations than can the fragmented array of interests and powers at the local, state, and regional levels which make up the policy milieu in the United States. Not only are they more easily represented, but such policy goals, involving issues of national patrimony, are ordinarily politicized and symbolic. Mexico's historical relationship with the United States, and its nationalistic and personalist form of government, practically insure that such issues will be prominently featured in Mexican politics. The centralization of policy, therefore, transforms localized questions into issues of national importance.

In conjunction with its strategic inferiority in relations with the United States, the policy system has inclined Mexico towards an emphasis on equity and international law as a means of settling resource disputes with its northern neighbor, that is, towards a political solution.⁸³ The fragmented policy system in the United States, however, has favored a more technical, less political treatment of water issues, domestically, and in bilateral relations.⁸⁴ As the recently concluded settlement of the salinity dispute amply indicates, the United States has generally pre-

⁸¹ In the past decade SARH has undertaken nearly 100 detailed investigations of groundwater hydrology throughout Mexico, the majority of which have focused on the border states. The ministry is currently in the process of making a detailed inventory of national groundwater resources and has substantially increased its data gathering and exploratory activities since the mid-seventies. See Comisión del Plan Nacional Hidráulico, *supra* note 74, at 19-23. Some measure of this recent interest may be seen in the fact that SARH, in conjunction with the National Autonomous University of Mexico and the University of Sonora, in October 1979 convened a week long conference in Hermosillo, Sonora devoted exclusively to groundwater and pressurized irrigation systems. The first such conference to be held in Mexico drew nearly 200 scholars and technical specialists from Mexico, Europe, and the United States, including the author.

⁸² Though its groundwater use along the border is rapidly escalating, especially in the major urban areas affected by population growth, the aggregate water resources of the U.S. make possible certain options for alleviating some of its groundwater dependency in the border area. The recently begun Central Arizona Project in Arizona, for example, is a water transfer project conceived in part as a measure for reducing groundwater reliance in the metropolitan area of Tucson. See U.S. DEP'T OF INTERIOR, WATER PROJECTS REVIEW, CENTRAL ARIZONA PROJECT, ARIZONA 8 (April 1977); Yoakum, *Drought?*, TUCSON MAGAZINE, July, 1979, at 24-25.

⁸³ Mumme, *supra* note 73, at 43-44.

⁸⁴ *Id.* at 44.

ferred public works and other pork barrel solutions to boundary and water conflicts.⁸⁵

As each nation approaches the groundwater conflict, the differences between their systems of policy and their particular orientation to water issues frame the context in which it will be negotiated. The past record suggests that such differences are reconcilable.⁸⁶ They may, however, be aggravated by the particular issues and trends in contemporary bilateral relations.

B. Contemporary Bilateral Trends

As the general state of bilateral affairs affects the groundwater conflict, it does so indirectly through Mexico's new energy resources and their importance to the United States. Briefly, these new discoveries have wrought important changes in U.S.-Mexican relations, changes which are yet developing. What has traditionally been praised as a "special relationship," has now become that of a "new relationship" focusing on oil and gas, bilateral trade, northward migration, and drug smuggling as the paramount contemporary issues.⁸⁷

The changes spell a more forceful Mexican bargaining posture in relations with the United States. Also implied is the departure from diplomatic practice to link negotiations in one arena to those in others. The more aggressive Mexican position was recently demonstrated in the negotiations on the sale of natural gas and has also been apparent in negotiations on preferential trade, especially tomato exports, in which Mexico implicitly linked petroleum exports to U.S. trade concessions.⁸⁸

It is reasonable to expect that the new relationship will impact on negotiations over groundwater. As this author has noted in an earlier article, the IBWC's handling of water conflicts has been paradigmatic of the earlier "special relationship" which current trends are now reshaping.⁸⁹ It can be expected that Mexico will increasingly pursue more favorable settlements of water resource conflicts than it has been willing to accept in

⁸⁵ Mann, *Politics in the United States and the Salinity Problem of the Colorado River*, 15 NAT. RESOURCES J. 113, 127-28 (1975); Tilden, *The Politics of Salt: Background and Implications of the Mexican-American Treaty of 1944*, at 77-79 (U. of Ariz., Institute of Government Research, 1976).

⁸⁶ Utton, *supra* note 14, at 649.

⁸⁷ The phrase *new relationship* was coined by a number of U.S. periodicals during Mexican President López Portillo's recent summit with President Carter in Washington, D.C. See, e.g., *Mexico's Macho Mood*, TIME, Oct. 8, 1979, at 50.

⁸⁸ Bath, *The Mexican Tomato: A Case of Dependency?*, 1979 PROC. ROCKY MTN. COUNCIL LAT. AM. STUD. 85; Williams, *United States-Mexican Energy Relations: Ambiguity and Fragility* 12-14 (Paper presented at Conference on United States-Mexican Energy Relations, Ariz. State U., 1979).

⁸⁹ Mumme, *supra* note 73, at 45.

the past, and that it will also use its petroleum leverage to link negotiations on groundwater with its posture on other issues vital to its national interest. In sum, this pattern of politicization is apt to make the context of water resource relations less stable than it has been in earlier water controversies.

C. Trends in Water Relations

As previously observed, nowhere has the quality of U.S.-Mexican relations been as amicable as in the area of boundary and water issues. With the settlement of the longstanding dispute over the Chamizal, the agreement in 1970 on a formula for adjudicating future boundary disputes,⁹⁰ and the resolution of the salinity dispute in 1973, the major issues, excepting the problem of groundwaters, seem to have been concluded.

Nevertheless, water issues have always been important in the borderlands and it is imprudent to assume that they will ever be permanently and definitively resolved. At the present time, several matters are yet potential sources of friction. Mainly a function of Mexican dissatisfaction with current treaty arrangements, but also stemming from U.S. grievances, these problems include:

1. Mexican dissatisfaction with:
 - a. The present allocation of waters under the 1906 and 1944 treaties.⁹¹
 - b. The implementation of mandated salinity control procedures in the San Luis-Mexicali valley.⁹²
 - c. The indemnification of damages to Mexican farmers in the San Luis-Mexicali valley affected by excessive salinization.⁹³
 - d. The periodic flooding of the lower Colorado delta by excess dis-

⁹⁰ The Boundary Treaty of 1970 has been hailed as "one of the most significant accords between the United States of America and Mexico in the twentieth century. . . ." It is presumed to definitively settle all past and future land and water boundary disputes between Mexico and the United States. See IBWC Jurisdiction, *supra* note 27, at 14-16.

⁹¹ The desertification of Mexican ejidal lands in the vicinity of Ciudad Juárez, Chihuahua has prompted recent demands for the reopening of the 1906 Treaty on the upper Rio Grande. See Meraz, *Texas Acapara el Agua del rio Bravo*, *Excelsior*, July 3, 1979, at 8, col. 4. The juridical basis for a reopening of the 1906 treaty rests, in part, on the U.S. failure to meet its treaty obligations. A detailed Mexican legal analysis and critique is found in ENRÍQUEZ COYRO, *EL TRATADO ENTRE MÉXICO Y LOS ESTADOS UNIDOS DE AMÉRICA SOBRE RÍOS INTERNACIONALES* 746-86 (1976). See also Day, *supra* note 60, at 171-72.

⁹² The Ixtoc 1 oil spill was most recently the occasion for an acrimonious exchange concerning the pace with which the United States is currently implementing the construction of the desalinization facility promised under Minute 242. Rising costs have led some Congressmen in the United States to further question the whole project. See, e.g., Williams, *supra* note 88, at 15.

⁹³ See *Houston Post*, Nov. 4, 1979, at 7, col. 1.

charges of Colorado water in years of high runoff.⁹⁴

2. U.S. concern with the deleterious effects of Mexican pollution discharged into international streams flowing into the United States.⁹⁵

These issues affect the groundwater situation by drawing attention to persisting questions of injury and equity in the present management of transboundary waters. They add to the delicacy and complexity of addressing the groundwater issue. Given the recent propensity for linking the negotiation of issues in one context with those in another, the recrudescence of old water controversies and the emergence of new ones is certain to complicate the settlement of the groundwater conflict.

V. SUMMARY AND CONCLUSIONS

The groundwater conflict graphically reveals the complex interdependence of the border region. Unlike the land's surface, the hydrological cycle cannot be divided so easily by legal convention. The integral relation between surface and ground waters, and a common dependence on both, point compellingly to the need for a technically sound and ecologically sensitive management approach to transboundary waters. For that purpose, as Sepulveda remarks, the IBWC is "better fitted . . . than the departments of foreign relations, especially since the Commission has been operating for such a long time and with such recognized efficiency."⁹⁶

The institutional and political context, however, nurture a political rather than a technical or ecological approach to the groundwater conflict. As suggested earlier, the IBWC is not oriented to pursue a comprehensive solution. This is significant, since a comprehensive treaty on groundwater will almost certainly require the advocacy of the Commission.

Furthermore, the current bilateral environment limits the Commission's opportunity to play a more advocative role in defense of a functional expansion of its powers. The differences in national approaches to water management encourage the development of groundwater, particularly by Mexico, and add to the potential for sovereign conflict over this resource essential to borderlands development. The changing bilateral relationship also implies the politicization of bilateral relations and a much sterner defense of Mexican rights to shared resources in the boundary region. The prospect for linking negotiations on groundwater to other im-

⁹⁴ See *U.S. dams' releases flood Mexican town*, Arizona Daily Star, June 2, 1979, § B, at 8.

⁹⁵ Both the San Pedro river crossing the Arizona-Sonora border, and the New River, crossing the Baja California del Norte-California boundary near Calexico have caused hazards and damage due to pollution. See Jamail & Ullery, *supra* note 23, at 21-47.

⁹⁶ Sepulveda, *supra* note 45, at 219-20.

portant bilateral issues is also evident.

Of the various alternatives short of a comprehensive solution to the management of transboundary groundwaters, the most feasible alternative remains some variation of the status quo. As one commentator has noted, the incremental, case by case management of transboundary groundwater aquifers describes the present approach of the IBWC in managing water conflicts.⁹⁷ While few analysts endorse this approach as an optimal solution, it has the merit of requiring no surrender of sovereignty nor massive modification of the current jurisdiction of the Commission under the 1944 treaty. Nor is the fact of its feasibility just expedient, for Minute 242, as another commentator has remarked, "demonstrated the vitality and flexibility of an established institution and of the cooperative spirit between the two nations."⁹⁸ While the international environment has changed, Minute 242 may prove to be serviceable as a model for a series of minutes, perhaps formalized as treaties, seeking to resolve individual conflicts as they become acute. The prospect for a greater level of bilateral cooperation in the case of groundwaters is much less favorable.

⁹⁷ Utton, *supra* note 14, at 646.

⁹⁸ Clark, *supra* note 20, at 158.