

Lining Canals in the Border Region: Can the U.S. Ignore Impacts on Mexico?

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INTRODUCTION

The 2000 mile border between the United States and Mexico traverses one of the most arid regions in North America. Conflicts over scarce water supplies in the border region have been a continuous part of U.S.-Mexican relations for over a century. Bilateral efforts to resolve these conflicts have focused on surface waters, culminating with the Treaty of 1944, which apportioned the waters of the Rio Grande and Colorado Rivers between the two nations. However, as water supplies in the region are stretched to their limits, the focus is shifting to the allocation of international groundwater supplies. Yet no agreement currently exists between the two nations for the allocation of these precious resources.

Unique bilateral conflicts over groundwater supply and quality occur in several distinct regions along the border. This paper focuses on one such region, the Imperial/Mexicali Valley¹, where various public agencies in the United States are planning to reline earthen canals and irrigation ditches. This idea threatens to interfere with the recharge of the aquifer straddling the border in the region and on which the agricultural economy of the Mexicali Valley is partially dependent.

This article's purpose is to give a broad overview of U.S.-Mexican relations with respect to water issues while focusing on the current Imperial/Mexicali Valley groundwater conflict. After describing the proposed projects and their potential impacts, the article discusses the inadequacies of the 1944 treaty as an instrument for resolving the issue. This is followed by a discussion of existing bilateral agreements exhibiting a cooperative approach to environmental issues which might serve as a model on which to resolve the current dispute. The article then focuses on some equitable principles as embodied in international law and some pragmatic concerns regarding the nature of U.S.-Mexico bilateral relations which should be considered by public officials and diplomats involved in

the bilateral consultations over the dispute. Finally, the article contains some general recommendations for resolving the dispute without adding to the existing strain on relations between the two countries.

I. THE PROJECTS

Two major canal lining projects that could adversely affect the groundwater supply in the Imperial/Mexicali Valley are either underway or in the planning stages. Each project is discussed separately below.

A. The All-American Canal Lining

In 1940, the All-American Canal began carrying Colorado River water, diverted at Imperial Dam, to the agricultural lands of the Imperial Valley (see map). Built as part of the federal Boulder Canyon Project which included the construction of Hoover Dam, the canal replaced an older route through Mexico.² The All-American Canal also delivers water to the Coachella Valley via the Coachella Canal and to the Yuma Valley of Arizona via the Yuma Main Canal. Because it was built as an earthen ditch through rather sandy terrain, considerable seepage has occurred from the All-American Canal. Estimates of seepage from the canal between Pilot Knob and the East Highline Canal (see map) have ranged from 105,000 acre feet per year (af/yr) to 220,000 af/yr.

In an effort to conserve this seepage so that the Bureau of Reclamation might meet the demands of its water contractors, Congress passed Public Law 100-675, which was signed by President Reagan on November 17, 1988. (See U.S.C.S., 102 Stat. 4000.) Title II of this act authorizes the Secretary of the Interior to enter into agreements with any of its California water contractors (Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley Water District, and The Metropolitan Water District of Southern

California) for the funding of the construction of a new canal or the relining of the All-American Canal between Pilot Knob and Drop 4. This 28 mile stretch of the canal lies immediately adjacent to the U.S.-Mexican Border. The legislation also authorizes lining a 38-mile section of the Coachella Canal which lies over 40 miles from the border (see map).³

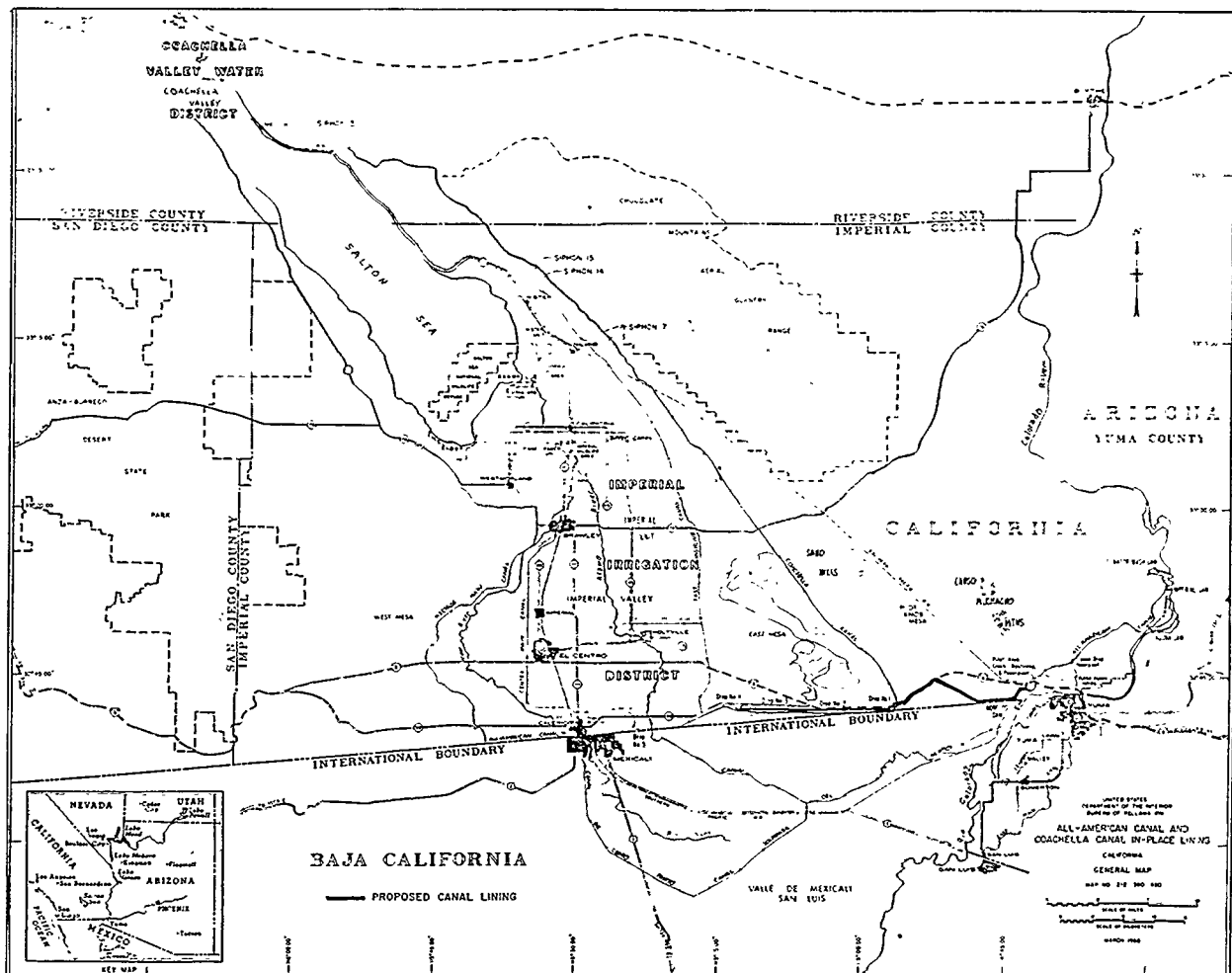
The Bureau of Reclamation estimates that the cost to reline the All-American Canal will be \$120 million, a savings of \$20 million over the cost of building a new canal. To avoid the problem of interrupting supply during construction, a new technology has been developed to allow lining while water is present in the canal. (In May, 1989, a prototype project was initiated to test this technology by lining a 1.5 mile stretch of the Coachella Canal.) It is estimated that the lining projects will conserve between 62,000 and 78,000 af/yr in the All-American Canal and between 24,000 to 45,000 af/yr on the Coachella Canal, for a total savings of 86,000 to 123,000 af/yr.

In accordance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), the environmental impact studies

for the projects have been completed and the draft environmental impact statement (EIS) and report (EIR) are currently being written. They are scheduled to be available for public review by the end of 1990, with the final EIS/R scheduled for completion by late 1991. While these studies considered impacts on wetlands and wildlife, including threats to the Yuma Clapper Rail, a bird listed as an endangered species, they failed to investigate the potential environmental impacts in Mexico.^{4,5}

B. The MWD/IID Project

The Metropolitan Water District of Southern California (MWD) is the largest purveyor of water for municipal and industrial uses in California, supplying approximately one-third of the state's population. MWD receives its water from the Colorado River and from Northern California via the California State Water Project. Faced with the loss of a portion of its Colorado River allocation as the result of a 1964 United States Supreme Court decision (*Arizona v. California*, 376 U.S. 340 (1964)) and with mounting opposition to



further diversions of water from Northern California, MWD found it necessary to seek alternative sources of water to meet the demands of a growing population in its service area. MWD seized on the recommendations of environmentalists and others that purchasing rights to water conserved by other appropriators would be both fiscally and ecologically preferable to the development of additional surface storage and diversion facilities.⁶ Imperial Irrigation District was the perfect partner for such a transaction.

Imperial Irrigation District (IID) was established in 1911 to supply Colorado River water to municipal and agricultural users in the Imperial Valley, a desert area receiving less than 4 inches of rainfall annually. Its irrigation practices and system of earthen canals built through porous desert soils resulted in seepage of significant portions of IID's total appropriation from the Colorado River. When ordered by the California State Water Resources Control Board to implement a conservation program (*see*, Water Rights Order 88-20, State Water Resources Control Board, September 30, 1988), IID turned to MWD for help. (*See*, Andrew Pollak, *The Salton Sea, I.I.D., and the Public Trust Doctrine: Some Implications of Water Transfers From the Imperial Valley*, 13 *Environs* April 1989, at 23.)

On December 22, 1988, MWD and IID entered into an agreement whereby MWD will assume the costs of extensive improvements to IID's internal conveyance systems, including the lining of over 300 miles of canals. In return, MWD will be entitled to divert an amount of water equal to the quantity conserved, estimated at 106,000 af/yr upon full completion of the project. The capital and indirect costs of the project are estimated at \$120 million in 1988 dollars. MWD will also assume annual maintenance costs of \$2.6 million.

The canals to be lined in the MWD/IID project area are at varying distances from the U.S.-Mexican border. The effect of the canal lining on transborder groundwater supplies will likely diminish the further the canals are from the border. Those canals nearest the border most likely to have the greatest impact on the transborder groundwater supply include a 5.2 mile stretch of the South Alamo Canal near the city of Calexico, and many miles of smaller, lateral canals lying within a few miles of the border. While MWD claims that lining these canals will have no impacts internationally⁷, such an assertion is questionable.

II. THE IMPACTS

Though the impacts of these projects on Mexico are difficult to quantify without extensive hydrogeologic and socio-economic investigations, some generalizations can be made. To understand these impacts, a brief introduction to the hydrogeology of the area would be useful.

A. Area Hydrogeology

For millennia, the Colorado River has deposited layers of silt, sand, gravel and clay up to two miles thick in the Imperial/Mexicali Valley region. River water percolating into this permeable layer over time has created underground reservoirs and continues to replace, or "recharge," waters that leave the aquifers either naturally or through pumping. More recently, leakage from conveyance channels, most notably the All-American Canal, has become a significant source of groundwater recharge.⁸

Though the Imperial Valley groundwater basin is continuous with the Mexicali Valley basin to the south, the extent and interconnection of the aquifers in the region are not fully understood. The U.S. Bureau of Reclamation describes the East Mesa aquifer, the most significant groundwater reservoir in the region, as underlying the area from Pilot Knob to the East Highline Canal. Another aquifer lies on the west side of the Imperial Valley which is apparently unconnected with the East Mesa aquifer. This is referred to as the Mexicali Valley Aquifer. This aquifer is currently fully developed and subject to some overdraft and salinity problems. While more research is required to understand their size and how the aquifers are connected, there is no dispute that these subsurface reservoirs are "fugitive resources" which do not respect international boundaries.

B. Lining Canals

Lining canals will have the obvious direct effect of interfering with a significant source of recharge in the Imperial/Mexicali Valley groundwater basin. Though this will not immediately deplete the aquifers, the frequency of overdraft will increase. This will lead to greater pumping costs as the water table drops. Over time, with the depletion of hydrostatic pressure in the aquifer, salt water intrusion may become a problem, adding to existing salinity problems in the area.

Less obvious are the potential indirect impacts. Increased pumping costs as water tables drop will increase production costs in the Mexicali Valley, thereby reducing the profitability and competitiveness of the region's agricultural economy. Some marginal land might be taken out of production. This would eliminate jobs and lead to increased immigration from Mexico into the U.S.

The Mexicali Valley is one of Mexico's most important agricultural regions, contributing nearly 25 percent of the value of the nation's total agricultural crop. (See, Fernandez, *The Mexican Border Region* at 60-62.) Much of this production is exported to the United States. A decline in this important sector of Mexico's export economy will decrease the flow of dollars into Mexico, thus impairing the nation's ability to service its foreign debt and extricate itself from its current economic crisis.

III. THE 1944 TREATY

Water interests in the United States hold the position that Mexico has no right to the seepage from the U.S. canals in the border region. (See, "Plan to Reline California Canal Has Mexico Fearing Water Loss," *Sacramento Bee*, October 1, 1989.) This argument is based on the theory that these canals carry water allocated to the U.S. by the Treaty of 1944. However, because this treaty failed to either guarantee any specific quantity to the U.S., to apportion groundwater, or to recognize the fundamental inter-relationship between surface and groundwater, it is inadequate as a means of settling groundwater disputes between the two nations. To understand the scope of the 1944 treaty, a discussion of the events leading to its development is warranted.

A. Treaty of Guadalupe-Hidalgo

When the Treaty of Guadalupe-Hidalgo was negotiated in 1848, ending the war between the United States and Mexico, settlement was sparse in the border region. Therefore, there was little incentive for the negotiators to consider the allocation of waters in the area. The treaty established the Rio Grande and the Colorado River as the international border for portions of their lengths, but the only provisions in the treaty regarding water rights were those which prohibited

either country from impairing navigability on the rivers to the detriment of the other.⁹

B. Treaty of 1906

Soon, however, increasing settlement and the development of agriculture along the Rio Grande resulted in inevitable conflict between the two nations over water. Diversions from the Rio Grande in the San Luis Valley of Colorado, coupled with periods of drought, reduced the river's flow to the detriment of farmers in New Mexico and Texas, as well as in Mexico. In 1895, Mexico accused the U.S. of breaching the 1848 treaty by rendering the river non-navigable and further claimed an equitable right to a portion of the waters. The U.S. countered with what has become known as the "Harmon Doctrine," named for then Attorney General Judson Harmon. Harmon declared that "[t]he fundamental principle of international law is the absolute sovereignty, as against all others, within its own territory." (21 Ops. U.S. Att'y. Gen. 281 (1895).) However, principles of comity and equity prevailed, resulting in the Treaty of 1906. This agreement allowed the United States to dam the Rio Grande at Elephant Butte but guaranteed 60,000 af/yr to Mexican farmers in the El Paso-Juarez Valley. This treaty did not deal with the Colorado River or the portion of the Rio Grande below the El Paso-Juarez Valley.

C. Negotiations

During this same period, Mexico became concerned about agricultural development in the Imperial Valley, which was being supplied with Colorado River water by a ditch cut by the Americans through a portion of Mexico. In exchange for this right-of-way, Mexico managed to negotiate a right to one half of the water carried by the "Imperial Canal," as the ditch was known. However, Mexico wished for a permanent division of the waters of the lower Colorado. Negotiations were proceeding toward a bilateral allocation of the waters of both the lower Colorado and the lower Rio Grande when revolution in Mexico ended discussions for 15 years.

By the time official negotiations resumed in 1929, Congress had passed the Boulder Canyon Act which authorized construction of facilities on the Colorado, including Hoover Dam and the All-American



canal. (*See*, 45 Stat.1057, 43 U.S.C.A. § 617.) Also, the seven states of the Colorado Basin had entered into a compact in 1922 which allocated the river's surface flow amongst them. At the urging of the federal government, this pact included a proviso for allocating water to Mexico in the event a treaty was eventually signed. (*See*, 70 Cong. Rec. 324 (1928).)

Events in Mexico also helped set the stage for new negotiations toward a comprehensive surface water treaty. After his election in 1924, President Plutarco Elias Calles (1924-1930) planned and constructed major water projects on the Mexican tributaries of the lower Rio Grande (Rio Conchos, Rio Salado, and Rio San Juan) as part of his ambitious national program of industrial and agricultural development. Threatened by the reduced flow on the lower Rio Grande, Texas farmers lobbied Washington in support of a treaty. Because it had the upper hand geographically on the lower Rio Grande, where Mexican tributaries contributed 70 percent of the river's flow, Mexico was able to insist that treaty negotiations include the Colorado River as well. However, with the nations unable to compromise as to the quantity of the Colorado River to which Mexico was entitled, or the quantity of the lower Rio Grande to which the Texans were entitled, the talks collapsed in 1930.

As Hoover Dam and the All-American Canal approached completion in the U.S. during the 1930s, newly-elected Mexican President Lazaro Cardenas (1934-1940) expanded development of irrigation projects on the tributaries of the lower Rio Grande and increased agricultural acreage in the Colorado River Delta Region in the State of Baja California. The possibility that Mexican farmers might increase established uses which a future treaty might be forced to recognize¹⁰ alarmed water interests north of the border. At the same time, Mexico became concerned that a proposed water project in Texas would allow the U.S. to make large diversions of the lower Rio Grande to the detriment of Mexican farmers in the Rio Grande delta.¹¹ These competing concerns, coupled with the Good Neighbor Policy of the Roosevelt administration, helped create the climate in which an agreement on the shared rivers was reached.

D. Agreement

On February 3, 1944, a treaty was formally signed.¹² In addition to apportioning the waters of the Rio Grande and the Tijuana River (a minor transboundary river which flows into the U.S. just south of San Diego), the treaty guaranteed to Mexico 1.5 million af/yr of Colorado river water. (Up until the time the U.S. Senate ratified the treaty in April, 1945, California water interests continued to oppose it, believing it was unduly generous toward Mexico at the expense of California.) The Treaty also changed the name of the International Boundary Commission, a bilateral commission which had been established in 1889 to carry out border agreements, to the International Boundary and Water Commission (IBWC). The treaty gave the renamed commission the authority to carry out the terms of the treaty, to settle disputes which might arise under it, and to construct, operate, and maintain joint projects and facilities.¹³ (*See*, 1944 Treaty at Article 2.)

While the 1944 Treaty has been reasonably successful in apportioning the surface water of the shared rivers and at directing the continued cooperation of the two countries with respect to water issues, its major shortcoming is its failure to discuss and allocate groundwater. The treaty negotiators recognized the importance of transborder groundwater resources, but "lack of technical data and fear that the complexities of

the groundwater question would interfere with agreement on division of surface water led diplomats to set the question aside." (See, Mumme, *Apportioning Groundwater Beneath the U.S.-Mexico Border*.)

E. Treaty Impacts

The U.S. government currently bases its claim of right to the seepage waters from the All-American Canal on the 1944 Treaty. The Secretary of the U.S. Section of the IBWC has stated that "the United States Government considers the waters in the All-American Canal to be United States waters, diverted to the United States under the 1944 treaty. The United States has the right to take whatever measures it wants to conserve those waters." (See, Manuel Ybarra, Secretary of the U.S. Section of the IBWC, as quoted by Larry Rohter in Sacramento Bee article, *supra*, p.18.) The U.S. Bureau of Reclamation even goes so far as to claim that Imperial Valley groundwater is apportioned to the U.S. by the 1944 Treaty. (Mumme at 33.) However, the language of the treaty does not support either of these claims.

As mentioned above, the Treaty is silent on the question of groundwater. The Colorado River and the canals which carry the water to farms and cities are the only significant sources of aquifer recharge in the area of the Imperial/Mexicali Valley. In light of this, the silence of the treaty on the issue of groundwater cannot logically be construed as an agreement on the part of the signers that Mexico should forego its rights to these sources of recharge of the groundwater supply.

While the treaty apportions a fixed quantity of Colorado River water to Mexico, no similar guarantee is made to the U.S. (1944 Treaty at Article 10.) It might be argued that the treaty language limits Mexico's rights to water to those amounts specifically enumerated, thereby reserving all water over this amount, including sources of groundwater recharge, to the U.S. The treaty states that "Mexico shall acquire no right beyond that provided by this subparagraph by the use of the waters of the Colorado system, for any purpose whatsoever, in excess of 1,500,000 acre feet...annually." (*Id.* at Article 10(b).) Though this could arguably be interpreted to apply to groundwater recharge, the provision is ambiguous at best. If this language had been meant to deny Mexico's right to all sources of groundwater recharge, the U.S. would have a legal claim under the treaty to all groundwater in

Mexico which is fed by the Colorado River system! Surely, had this been the intent of the negotiators, the treaty language would have been more explicit on this point.

In addition to the 1.5 million af/yr, the treaty guarantees to Mexico "any other quantities arriving at the Mexican points of diversion...." (*Id.* at Article 10.) While at first this provision may be interpreted as assuring Mexico's right to utilize seepage from U.S. canals, the treaty defines "to divert" as deliberately removing water from "any channel." (Article 1.) The treaty fails to define channel, but the meaning would presumably exclude underground aquifers. At best, the 1944 Treaty is ambiguous as it relates to Mexico's right to groundwater from aquifers recharged by the Colorado River and canals north of the border.

Many commentators have pointed out that legal regimes which fail to recognize hydrological unity of surface water and groundwater supplies, a condition referred to by one author as "hydro-schizophrenia,"¹⁴ cannot provide meaningful resolutions of conflicts which arise with respect to their uses. (See, Utton, "The Development of International Groundwater Law;" see also Hayton, "The Law of International Aquifers.") One author speaks of a growing "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." (Mumme, "The U.S. Conflict Over Transboundary Groundwaters.") The 1944 Treaty ignores this important interrelationship. Thus it cannot, and should not, serve as a framework for determining the rights of the U.S. and Mexico with respect to these seepage waters.



IV. EXISTING BILATERAL AGREEMENTS

Since the Treaty of 1944, the U.S. and Mexico have entered into several bilateral agreements which deal with transborder environmental issues. While only one deals directly with groundwater, the others are significant in exhibiting the potential for bilateral cooperation in managing border environmental problems.

A. Minute 242

The first of these agreements arose out of the salinity crisis of 1961-1973. In the 1950s, farmers in the Wellton Mohawk Irrigation District in Yuma County, Arizona, began importing Colorado River water to replace the groundwater relied on previously, which had become heavily saline due to leaching and repeated use.¹⁵ When the imported water raised the water table, the saline water saturated the surface. The solution was to construct a deep well drainage system which pumped from the highly saline aquifer. These waters were drained into the Colorado River just upstream of Morelos Dam, the point of diversion of Mexico's treaty allotment of Colorado River Water! While this lowered groundwater levels in the Wellton Mohawk area, it caused the salinity of treaty water delivered to Mexico to rise from an annual average of 800 parts per million (ppm) in 1960 to 2700 ppm in late 1961. When Mexico lodged a formal protest with the United States in November of 1961, the response was that the 1944 treaty gave no guarantee of quality. The dispute was to last over a decade.

Meanwhile, to replace unusable saline water, Mexico embarked on an ambitious program of groundwater development in the border region near the Colorado River. By 1963, over 600 wells were drilled in the northeast part of the Mexicali Valley alone. By 1972, more wells were drilled on both sides of the Arizona-Sonora border, and a pumping war was on. The issue placed a significant strain on bilateral relations between the two countries during this period.

In his book, *Cadillac Desert*, Marc Reisner describes what happened next:

In 1973, for reasons which are still obscure- but which might conceivably have had something to do with the fact that Mexico showed some promise of owning a great deal of oil- President

Richard Nixon appointed a former U.S. Attorney General, Herbert Brownell, to work out a hasty solution.

(Marc Reisner, *Cadillac Desert*, at 481.) On August 30, 1973, as a result of negotiations, the IBWC promulgated Minute 242.

Though Minute 242 is the first (and only) bilateral agreement addressing groundwater, it is very limited in its scope. Aside from guaranteeing the quality of waters delivered to Mexico under the 1944 Treaty, the agreement limits groundwater pumping by both countries to 160,000 af/yr within five miles of the Arizona-Sonora border "[p]ending the conclusion by the Governments of the United States and Mexico of a comprehensive agreement on groundwater in the border areas..." (IBWC Minute No. 242, at point 5.) In addition to this call for a groundwater treaty, Minute 242 contains the following provision:

With the objective of avoiding future problems, the United States and Mexico shall consult with each other prior to undertaking any new development of either the surface or the groundwater resources, or undertaking substantial modifications of present developments, in its own territory in the border area that might adversely affect the other country.

(*Id.* at point 6.) This is the provision pursuant to which current consultations of the IBWC on the Imperial-Mexicali groundwater dispute are being held.

B. Other Agreements

Three other agreements which deal primarily with transborder pollution deserve mention here. First, IBWC Minute 261 was a response to a 1979 joint communique between Presidents Jimmy Carter and Jose Lopez Portillo which directed the IBWC to make recommendations for the solution of border sanitation problems. Minute 261 gave the IBWC an expanded role in monitoring border sanitation with respect to water. (See, Mumme, "The Background and Significance of Minute 261 of the International Boundary and Water Commission.") Secondly, in response to the Bahia Campeche oil spill which occurred on June 3, 1979, the U.S. and Mexico entered into a 1980 Treaty to cooperate in the prevention and response to toxic

spills in the marine environment. (*See*, Weston, "The United States-Mexico: Coping With Environmental Problems.") Finally, in 1983, Presidents Ronald Reagan and Miguel de la Madrid entered into an executive agreement to cooperate in the protection, improvement and conservation of the environment in the border area. (*See*, Hoffmann, "International Agreement- Agreement Between The United States of America and The United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area.") Under the "La Paz Agreement," as the latter is known, the two nations have agreed to four subsequent "annexes" to supplement the original agreement.¹⁶

C. Implications

Through these agreements the two nations express their mutual recognition of the fact that environmental problems do not respect international boundaries and that cooperative solutions to such issues are required. They also reflect the understanding that actions in one country have the potential to do considerable harm in the other. In requiring consultation before modifying border water projects in Minute 242, surely the parties contemplated more than merely establishing a forum to discuss the issue while the projects proceed. Rather, to be meaningful, the goal of such consultations must be to cooperate in avoiding the kind of adverse effect on the other nation that occurred in the Wellton Mohawk salinity incident. While the pollution agreements do not bear directly on the issue of groundwater, they do exhibit the spirit of cooperation which can exist between the two countries in confronting a deteriorating border environment. The U.S. position that it can ignore the adverse impacts upon Mexico due to canal lining in the border region is inconsistent with the spirit embodied in these other agreements.

Furthermore, interfering with the recharge of groundwater supplies to the detriment of the other nation is an environmental problem which is analogous in effect on the user to pollution of a water source. Both require remedial action and increased expenditures on the part of the party adversely affected to mitigate the effects. Protecting the availability of developed water supplies is as essential to the health and welfare of Northern Mexico as is protecting that supply from pollution. Therefore, the spirit of the existing bilateral

pollution agreements requires that the United States consider the impact of the canal linings in the same light as it would the release of toxic substances into the border waters, and that the U.S. take action to assure that the adverse effects of the projects on Mexico are mitigated.

V. INTERNATIONAL LAW PRINCIPLES

Since a comprehensive groundwater treaty between the U.S. and Mexico, as envisioned by Minute No. 242, is not likely to be concluded in the near future, existing international legal principles must serve as the basis for a resolution of the current dispute. While "[t]he development of international law...for managing groundwater resources and for resolving disputes is in its infancy" (Berkley and Utton at 718), certain principles have been recognized by nations, international tribunals, and international legal scholars. These principles should serve as a guide to the negotiated settlement of this and other groundwater conflicts in the border region until a groundwater treaty can be consummated.

The concept that a nation has absolute sovereignty over water resources within its territory which are part of an international water system has been largely rejected in international law. Even while negotiating the 1944 Treaty, "U.S. legal strategy accepted the notion of restricted territorial sovereignty, acknowledging that the United States did not have an absolute unilateral right to develop its waters regardless of the effect on Mexico." (Mumme, "Apportioning Groundwater Beneath the U.S.-Mexico Border," at 32.) Today, international law recognizes that nations which have a common water resource should share the resource in a "reasonable and equitable" manner. This is the approach taken by two international bodies which have drafted what amount to "restatements" of international water law.

A. Helsinki Rules

In 1967, after a decade of study, the International Law Association (ILA) published a set of rules concerning the uses of waters of international rivers. (*See*, International Law Association Report of the 52nd Conference, 447-533 (1967).) These rules, known as the Helsinki Rules, clearly recognize the importance of underground waters as part of "international drainage



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basins" to which the rules apply.¹⁷ Article IV of the rules state that "[e]ach basin state is entitled within its territory to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin." (*Id.* at 486.)

In determining what constitutes a reasonable and equitable share, the rules list the relevant factors to be considered. These include: 1) the contribution of water by each basin state; 2) past and current utilizations; 3) the economic and social needs of the basin states; 4) the population dependent on the waters; 5) the comparative cost of alternative means of satisfying the social and economic needs of each basin state; 6) the availability of other resources; 7) the avoidance of unnecessary waste; 8) the feasibility of compensation as a way to settle conflicts between users; and 9) the extent to which the needs of one basin state may be met without causing substantial injury to a co-basin state. (*Id.* at 488.)

B. International Law Commission

The International Law Commission (ILC) of the United Nations in its 1983 Draft Report on international water law takes an approach similar to the ILA. Rather than an international drainage basin, the ILC uses the concept of an "international watercourse system," which also includes groundwater but is more flexible and comprehensive than the drainage basin concept utilized by the Helsinki Rules. The ILC Draft Report states:

An international watercourse system and its waters shall be developed, used, and shared by system states in a reasonable and equitable manner on the basis of good faith and good neighborly rela-

tions with a view to attaining optimum utilization thereof consistent with adequate protection and control of the watercourse system and its components.

(International Law Commission Report at 27, notes 71-2 (1983), cited in Caponera, *supra*, at 564-567.) The ILC report also lists factors similar to the ILA factors to be considered in determining reasonable and equitable manner of use. (*Id.* at 567, note 12.) However, the ILC list expands somewhat on the factors of the Helsinki Rules. The ILC list includes the following factors: 1) the special needs of the states, including the stage of economic development; 2) the development and conservation of water by the concerned states; and 3) the other uses of waters by the state concerned in comparison with the uses by other system states, including efficiency of such uses.

Both the ILA and ILC approaches recognize the importance of sharing international freshwater supplies in a fair and reasonable way. One can only speculate how a balance of the equity and reasonableness factors would come out in the current context. But given Mexico's less developed economic state, its heavier dependence on groundwater in the border region, the paucity of alternative sources of water available to Mexico in the border region, and the admittedly inefficient U.S. conveyance systems, it is unlikely that international law, as expressed in the Helsinki Rules and the ILC Draft Report, would support the U.S. position in the dispute over groundwater in the Imperial/Mexicali Valley.

C. Neighborly Principle

A corollary to the proposition that nations must share international water supplies is the proposition

that nations "are responsible for substantial transboundary injury originating in their respective territories." (*Id.* at 566.) This concept is embodied in the Neighborly Principle recognized by both the U.S. and Mexico through their participation in the United Nations Conference on the Human Environment in Stockholm, Sweden in 1972. (Weston, *supra*, at 123.) The concept is also implicitly acknowledged in the bilateral pollution agreements between the U.S. and Mexico discussed above. In the modern world, it is simply a matter of common sense that nations must account for acts within their boundaries which adversely impact neighboring nations and they must act cooperatively to prevent such effects.

One commentator predicted how these principles of international law might be applied by the International Court of Justice in the context of the U.S.-Mexico groundwater conflict:

In the event a groundwater question between Mexico and the United States resulted in litigation, the court undoubtedly would conclude that a nation does not have absolute territorial sovereignty and that it cannot act in disregard of its neighbor.

(Utton, *supra*, at 649.) Negotiators and water interests in the U.S. should recognize the likelihood of this result. By acknowledging these principles, much precious time will be saved in resolving the current dispute and the broader issue of apportioning groundwater beneath the U.S.-Mexico border.

CONCLUSION

Water conservation measures like the ones planned by the U.S. near the California-Mexico border are essential to ensure a continued water supply to meet the needs of agriculture and a growing population on both sides of the border. However, such measures have the potential for significant transboundary impacts. The failure of the U.S. to adequately consider these potential harms in its planning process is irresponsible. To follow through with the proposed projects in the face of protests by the Mexican Government would violate international law as well as the spirit of existing agreements between the two nations.

Furthermore, such a move could jeopardize future negotiations and cooperation between the two

neighbors on important bilateral issues. (See, *The Challenge of Interdependence: Mexico and the United States*, Report of the Bilateral Commission on the Future of United States-Mexican Relations.) Improved relations between the U.S. and Mexico are essential if there is to be meaningful progress in the critical areas of trade, debt, illicit drugs, and immigration. Conflict over transboundary groundwater has the potential to affect bilateral efforts in these areas and may even overshadow these issues in terms of urgency and importance. At least one Mexican scholar considers the issue of transboundary groundwater one of the questions most likely to affect U.S.-Mexican diplomatic relations in the final years of the twentieth century. (Sepulveda, *Los Recursos Hidraulicos en la Zona Fronteriza Mexico-Estados Unidos. Perspectiva de la Problematica Hacia el Ano 2000-Algunas Recomendaciones*, at 1081.)

A cooperative resolution of the dispute is essential to the interests of both nations. As the U.S. and Mexico become increasingly interdependent, it is difficult to see how the U.S. can cause harm to Mexico without also harming itself. U.S. banks rely on an improving Mexican economy to receive payments on



Mexico's huge foreign debt. U.S. law enforcement agencies depend on the cooperation of Mexican officials to interdict illicit drug traffickers. American corporations look to Mexico to protect existing investments and to offer new investment and trade opportunities. American consumers rely on Mexican agriculture to provide affordable winter vegetables. And both sides agree that a healthy and productive economy in Mexico's border states is essential to reduce the socio-economic pressures leading to the huge tide of illegal migration into the U.S. The current U.S. position on the Imperial/Mexicali Valley groundwater issue threatens its own interests as well as Mexico's in these critical areas.

Because of the many existing obstacles, a comprehensive groundwater treaty between the U.S. and Mexico is not likely in the near future. Therefore, a negotiated interim settlement to the current dispute, similar to what was accomplished in Minute 242, must be reached through the existing institutional framework of the IBWC.

There are several possibilities for a temporary solution to the conflict over groundwater in the Imperial-Mexicali Valley region. One possibility would be for the U.S. to proceed with its projects and compensate injured Mexican farmers for the amount of water lost or for the increased pumping costs as water levels drop. An alternative would be for the U.S. to acknowledge Mexico's right to an amount of water which would be lost by the relining projects as determined by hydrogeologic studies currently being conducted by the IBWC. This amount could be conveyed to Mexico via surface canals in addition to the amount currently being delivered under the 1944 treaty. A third alternative would be for the U.S. to give technological and financial assistance to Mexico for the purpose of lining canals in the Mexicali Valley. The water conserved would likely offset much of the groundwater lost by increasing the efficiency of surface conveyance systems in the area.

The ultimate solution, as envisioned by IBWC Minute No. 242, is a comprehensive groundwater treaty between U.S. and Mexico. But the nations need not start from scratch to develop such a treaty. A proposed agreement and institutional framework has been developed by a group of legal scholars, scientists, and technicians concerned about the problems involved with international aquifers. The proposal as contained

in the Ixtapa Draft Agreement (*see*, Rodgers and Utton) and the revisions as embodied in the Bellagio Draft Treaty (*see*, Hayton and Utton, "Transboundary Groundwaters: The Bellagio Draft Treaty") recommend a system of cooperation for optimum utilization of these resources. Based largely on the U.S.-Mexico experience but adaptable to other areas of the world, the proposal has the following recommendations and features: 1) equitable allocation of the resource by mutual agreement rather than unilateral act; 2) establishment of a joint agency similar to the IBWC, with jurisdiction over groundwater quantity and quality, to implement the treaty; 3) the designation by the joint agency of critical zones requiring special protection; 4) enforcement and administration by the party states themselves to minimize intrusions on sovereignty; and 5) a recognition of the interrelationship between surface and groundwater. The proposed agreement was developed with the hope "that such efforts will provide the basis for new understandings by the political leaders involved, in order that they may...face up to the physical, chemical, biological, economic and societal realities before it is too late." (Hayton and Utton at 676.)

The groundwater dispute in the Imperial/Mexicali Valley challenges the parties involved with many complex technical, political and legal problems. At the same time, it presents them with a tremendous opportunity for enlightened progress in the area of international water law. Rather than being guided by narrow regional self interest, the U.S. can achieve such progress by acknowledging established principles of international law, the spirit of its existing agreements with Mexico, and the realities of U.S.-Mexican mutual interdependence.

ENDNOTES

¹ The Imperial Valley in the U.S. and the Mexicali Valley in Mexico are actually a single, continuous valley transected by the international border.

² Originally named the Imperial Canal (now the Alamo Canal), this older route carried Colorado River Water through Mexico via an overflow channel of the Colorado River and into California just east of Mexicali. The canal first delivered water to the Imperial Valley in 1901. Agricultural interests in the Imperial Valley disliked this older route because Mexico demanded up to one-half of all water diverted through the canal as the

price of the right-of-way. Furthermore, there was the concern that Mexico might increase agricultural acreage in the area along the canal, thereby competing with Imperial Valley farmers for water and markets. This led to the clamor in Congress for an "all-american" canal. See Hundley, *Dividing the Waters* at 31-36, & 67.

³ After the U.S. and Mexico agreed on Minute No. 242 (see discussion *infra*) Congress authorized the lining of a 49 mile stretch of the Coachella Canal so that the water conserved could replace waters which would have to be released for delivery to Mexico under the agreement. See 43 U.S.C. 1572. See also Joseph F. Freidkin, "The International Problem With Mexico over the Salinity of the Lower Colorado River," in *Water and the American West: Essays in Honor of Raphael J. Moses*, ed. David H. Getches at 39.

⁴ Personal conversation with Mr. Martin Einert of the Planning Department of the Lower Colorado Regional Office, Bureau of Reclamation, U.S. Dept. of the Interior, Boulder City, Nevada.

⁵ Executive order number 12114 (44 Fed. Reg. 1957), issued by President Carter on January 4, 1979, requires all federal agencies to implement procedures whereby transborder impacts would be considered in making decisions regarding approval of "major Federal actions." Where the action significantly affects the environment of a foreign nation, agencies are required to either prepare reviews of environmental issues or designate bilateral environmental studies to be prepared by an organization in which the United States is a member. (§2-4.) Presumably in this case that would be the International Boundary and Water Commission. For purposes of the order, "environment" is defined as "natural and physical environment and excludes social, economic and other environments." (§ 3-4.) However, the final provision of the order states that where an environmental impact statement (EIS) is required to assess impacts within the U.S., none is required with respect to effects on the environment of foreign nations. (§3-5.)

⁶ See Stavins, *Trading Conservation Investments for Water: A Proposal for the Metropolitan Water District of California to Obtain Additional Colorado River Water by Financing Water Conservation Investments for the Imperial Irrigation District*. On page 124, the author mentions potential transboundary impacts, trusting other "investigations" to resolve the dilemma.

⁷ Personal Conversation with Mr. Fadi Kamand, Colorado River Resources Division of MWD.

⁸ In the 20 years after the construction of the All-American Canal, groundwater levels in the border region rose as much as 60 feet. See O.J. Loeltz *et al*, *Geohydrologic Reconnaissance of the Imperial Valley, California* at K19-K22.

⁹ An excellent treatment of the events leading up to the 1944 Treaty which allocated transborder surface waters between the two countries is Hundley, *supra*, note 2, from which much of the following discussion is drawn.

¹⁰ The Prior Appropriations Doctrine, often expressed as "first in time, first in right," was recognized as the governing principle for establishing water rights in the arid west. Under this doctrine, those who first put water to reasonable, beneficial uses had priority of right to those waters.

¹¹ The Valley Gravity Canal and Storage Project would have diverted Rio Grande water upstream of a major Mexican diversion point, thus effectively neutralizing Mexico's advantage on the Lower Rio Grande. Hundley, *supra* note 2, at 95.

¹² Treaty Relating to the Utilization of the Colorado and Tijuana Rivers and of the Rio Grande, February 3, 1944, United States-Mexico, 59 stat. 1219, 1947 U.N. Treaty Series 313 (effective November 8, 1945), hereinafter referred to as the 1944 Treaty.

¹³ The Commission is comprised of a U.S. and Mexican Section. The Commissioner has the status of ambassador and the joint agreements, or "Minutes", are the equivalent of an executive agreement. The commission is headquartered in the adjacent border cities of El Paso and Ciudad Juarez.

¹⁴ Caponera and Alheritiere, "Principles for International Groundwater Law," citing Llamas, "Hydroschizophrenia," 82 AGUA (1974).

¹⁵ The Wellton Mohawk oasis is a natural basin in which much of the groundwater pumped for irrigation, less evaporation, returned to the aquifer. The net result was an ever saltier groundwater supply. See, Bakker and Lillard, *The Great Southwest: The Story of a Land and Its People*, at 258.

¹⁶ Annex I is an agreement to cooperate on the resolution of sewage pollution problems on the Tijuana River. Annex II is a joint contingency plan for responding to inland discharges of hazardous wastes in the border region which complements the earlier agree-

ment on marine oil spills. Annex III regulates transborder shipments of hazardous substances. Annex IV is an agreement to cooperate in regulating transborder air pollution from copper smelters on both sides of the border. Boyd Sprehn, *Water, Hazardous Substances and Wastes, and the Mexican-American Frontier*, unpublished paper written for Professor James Smith's Mexican American Legal Relations class, U.C., Davis School of Law. See also Mumme, *La Paz Agreement: Progress and Problems in Managing the Border Environment*.

¹⁷ The "international drainage basin" concept as used by the ILA includes only those underground waters that "contribute" to the international river or "other common terminus." See ILA Report, *supra*, at 485, comment (b). It is uncertain that, as worded, this would include groundwater recharged by an international stream. However, there can be little doubt that the same principles would apply, regardless of minor hydrogeologic distinctions between the water resources in question.

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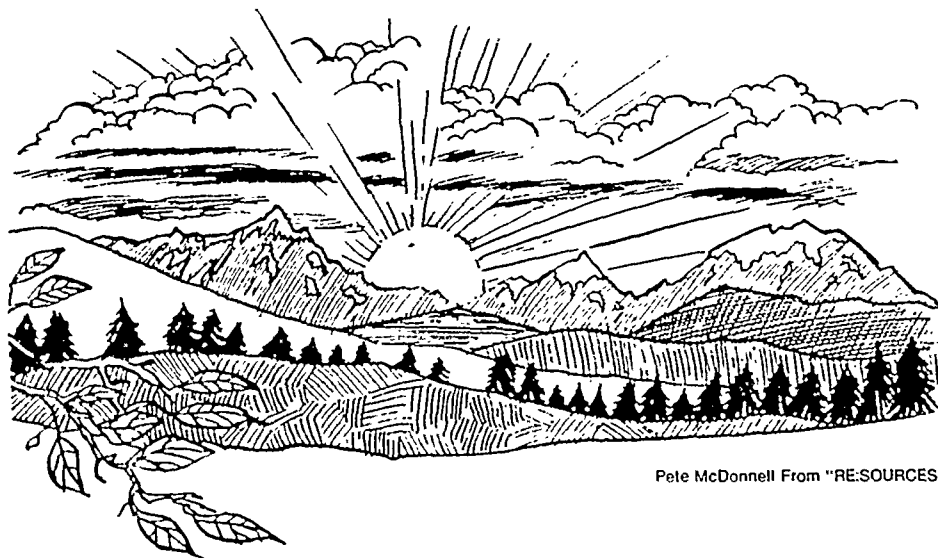
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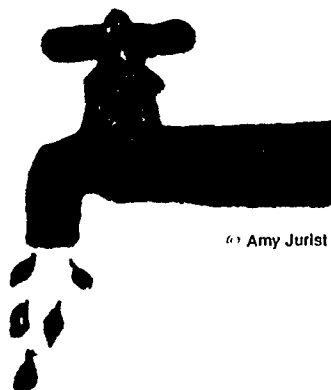
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