UNITED STATES - MEXICAN BORDER

WATER POLICY

AND

THE COLORADO RIVER

Debora A. Hererra

Senior Thesis

History of Public Policy

Winter 1986

Abstract

United States-Mexico relations are examined historically by my study of their policies regarding the Colorado River which have culminated in the present frictions over international boundary groundwater. My presentation of the policymaking approaches of each country helps to explain the complexities involved. Political considerations combined with the unique characteristics of the Colorado River and the border groundwater explain the uncertain future for water supply in the border region.

Table of Contents

I. Introduction

II. The Colorado River and the Colorado River Compavt of 1922

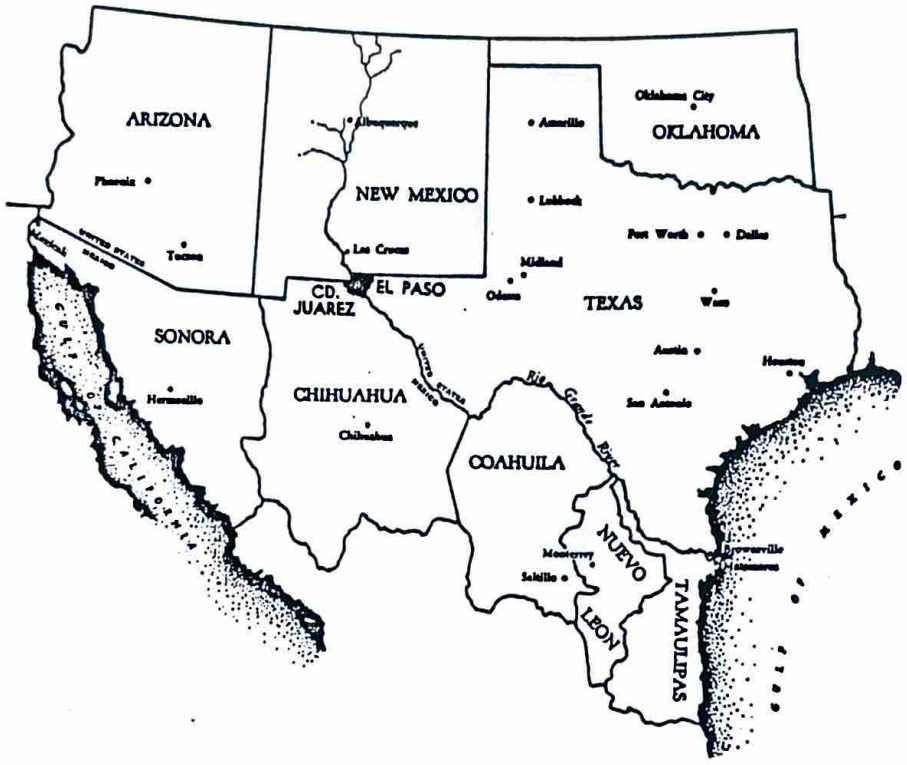
III. The Complexity of Events Preceding the Negotiations of the 1944 Treaty

IV. The 1944 Treaty

V. Colorado River Salinity Crisis

VI. Groundwater Policy in the United States and Mexico

VII. The Future of Water Policy in the U.S.-Mexico Border Region



Map 1. United States–Mexico Border Region. Adapted from Nestor Valencia, "Twentieth Century Urbanization in Latin America and a Case Study of Ciudad Juarez" (M.A. thesis, University of Texas at El Paso, 1969, in UTEP Archives, no. 518), p. 29.

I. INTRODUCTION

In contrast to present United States foreign relations, the U.S.-Mexiacn relationship is distinct for its lack of of military and defense dominance. The policy issues between the two governments are a function of their increasing interdependence of culture, society and economy. Therefore, issues of dispute usually involve resources - people resources such as with the immigration issue and natural resources. Historically, policies regarding natural resources are slow to be formulated. There is a tendency to do nothing until a crisis situation arises. In times of crisis, emotions are intense and work further to complicate an already complex situation.

Amidst the issues of trade, immigration, and energy,another resource - water - is a crucial problem in this world of scarcity. U.S.-Mexican water issues have surrounded two rivers, the Río Grande and the Colorado, which also serve as the international boundaries. The U.S. and Mexican states which make up this border area are: Texas, New Mexico, Arizona, and California of the American Southwest; Tamaulipas, Nuevo León, Coahuila, Chihuahua, Sonora, and Baja California of northern Mexico. This border dramatically delineates a point where two different civilizations with such contrasting economic statuses come together for better or for worse. The life here reflects the distance these states are located ~~form~~ from their respective central governments. The rapidly expanding populations and extensive agricultural and industrial activities taking place in

these border communities which increases exploitive potential of resources, gives rise to problems unique to these areas. Therefore, it is necessary for policymakers to account for these particularities to successfully make and implement policy.

Donald L. Wyman most appropriately describes U.S.-Mexico policy as being "intermestic" - a blend of international and domestic arenas (Wyman, 198:59). However, this blend tends to reflect a heavier weight placed on domestic policy agendas. At times, this sensitivity to domestic policy objectives has predisposed the United States to a precarious position with Mexico. A prime example which highlights these aspects of the United States' policy approach toward Mexico can be illustrated in the allocation of the international boundary waters.

The border area encompasses an arid and semi-arid climate which can only come to life with the flow of the Rio Grande and the Colorado. The farming areas on each side are ironically dependent on water which originates from the opposite side. Thus, nature's inherent disregard for political boundaries has forced the United States and Mexican governments to cooperate in resolving border water disputes. The problem with this situation is that political considerations tend to override sound water management.

In 1914 an agreement was signed between the United States and Mexico in the form of a treaty* which provided for the allocation of the three international streams - the Rio Grande,

---

*The full name of the treaty is the Treaty with Mexico Relating to the Utilization of the Colorado and Tijuana Rivers and of the Rio Grande, February 3, 1944, hereafter to be referred to as the 1944 Treaty.

the Tijuana, and the Colorado River (U.S. Statutes at Large, 1946: 1291-1267). My focus of study will be on the Colorado River because of its origin in the United States and its function as a boundary not only internationally but also as the state border between Arizona and California. With my emphasis on a regional analysis, I will show how domestic interests arising from the states of the Colorado River Basin region played a major role in the 1944 Treaty.

My concern for present and future policy considerations leads me to my examination of the issue of groundwater, a less visible source of conflict in contrast to river or surface water refers to water which is stored in underground aquifers or bolsons.* The present "pumping war" cannot be resolved through the existing 1944 Treaty due to its exclusion of groundwater allocation (Furnish & Ladman, 1975:83).

The International Boundary and Water Commission was established by the 1944 Treaty as the formal institution to handle specific water matters in this limitrophe region. However, according to the stipulations of the treaty, the Commission serves as a technical adviser with an engineer as its Commissioner. By virtue of its existence as a technical agency, the Treaty does not acknowledge its inevitable political status. But as times have changed, so have the approaches to policy-making. These changes are evident in the realization that sensible water management necessitates more than the sole knowledge

---

*A bolson is a broad and nearly flat mountain-rimmed desert basin with interior drainage.

of engineering. In fact, it involves an entire complex of water-related problems which are intertwined in their complexity. Ultimately, it is important to continuously be aware that public policy involves human beings making policy for human beings which includes the manifestation of the affective, emotional responses intrinsic to human nature. Thus, these emotional responses also guide the approach to policymaking. In respect to U.S.-Mexico relations, emotional responses include Mexico's fear of United States' encroachment and the tendency of the United States to feel that Mexico's government with its ever-present corruption and its general inability to sufficiently meet the demands of the modern world, is not an equal but a subordinate. These aspects of U.S.-Mexico policymaking cannot be analyzed quantitatively but are as crucial as the early measured technical aspects.

The friction over groundwater has emerged most visibly in the vicinity of the Colorado River, although other areas along the border have not been immune to it. In the Texas-Chihuahua, Tamaulipas, Coahuila and Nuevo Leon zone, the cities of Brownsville and Matamaros draw most of their water from the Rio Grande. Good quality groundwater is relatively abundant and has often been used to supplement surface supplies. Overusage and problems with controlling pollution portend future dependence on groundwater. At this time, Texas farmers are undergoing conflicts with the city and state government which are sure to intensify with this issue (City of Brownsville, 1979:14-15).

Del Rio, Texas and Ciudad Acuña, Cohauila comunities depend greatly on the Trinidad-Edwards aquifer. Presently there does not exist any severe problems, but the evidence of continuous growth of farming areas on the Mexican side of the border are grounds for potential conflict in the near future (Clark, et al., 1964: 7-10).

The El Paso, Texas - Ciudad Juarez, Chihuahua region is the area in which the groundwater has been the most thoroughly studied. Its dependence on the Hueco Bolson is striking. For example, El Paso receives 94% of its water needs from groundwater alone (Day, 1978:163-180).

In the zone of New Mexico-Chihuahua there are areas of extensive framing, but overdevelopment has not generally occurred. However, again I must stress that continuous growth calls for present policy situation to meet future needs.

San Diego, California and Tijuana, Baja California rely heavily on groundwater to augment their reservoir supplies from the Barrett, Morena, and Rodriguez dams. San Diego depends on groundwater for its irrigation and farming needs. The city of Tijuana was forced to import water from the Colorado River in 1972 and needs groundwater to augment water supply (Cabrera-Fernandez, 1978:11-28).

My study will center on the groundwater situation in the Sonoran Desert Borderlands, since it is within this area where the International Boundary and Water Commission is initially confronted by the groundwater issue. The border communities in this area are: Agua Prieta, Naco, Nogales, San Luis Rio

Colorado in the State of Sonora, and Mexicali in Baja, California. The U.S. counterparts are Douglas, Bisbee, Nogales, Yuma, Arizona and Calexico, California in the Imperial Valley. Although my discussions concentrate on specific situations in this area, I hope to provide important insights and considerations to the task of policymaking in such circumstances where two countries share water resources.

Unfortunately, due to a lack of published sources in English, I am unable to give equal representation of the Mexican perspective as I will of the United States' point of view. This is especially true with the relatively recent groundwater dispute. However, my research has included varied historical sources which were valuable in establishing the Mexican view to a large degree.

It is only when we examine how both sides perceive an issue that we can truly be capable of realizing a bilateral policy that will be flexible enough to facilitate the changing and yet specific enough to guarantee a secure future for both the United States and Mexico.

Bibliography

Cabrera Fernández, Carlos. "El Desarollo Económico de Tijuana en Ralción al Suiministro de Agua y la Contaminacion Atmosferica, Marina y Acuatica." Natural Resources Journal, 18 No. 1 (1978), pp. 11-28.

City of Brownsville. The State of the City of Brownsville. City of Brownsville: ; Planning and Community Development Department, 1979.

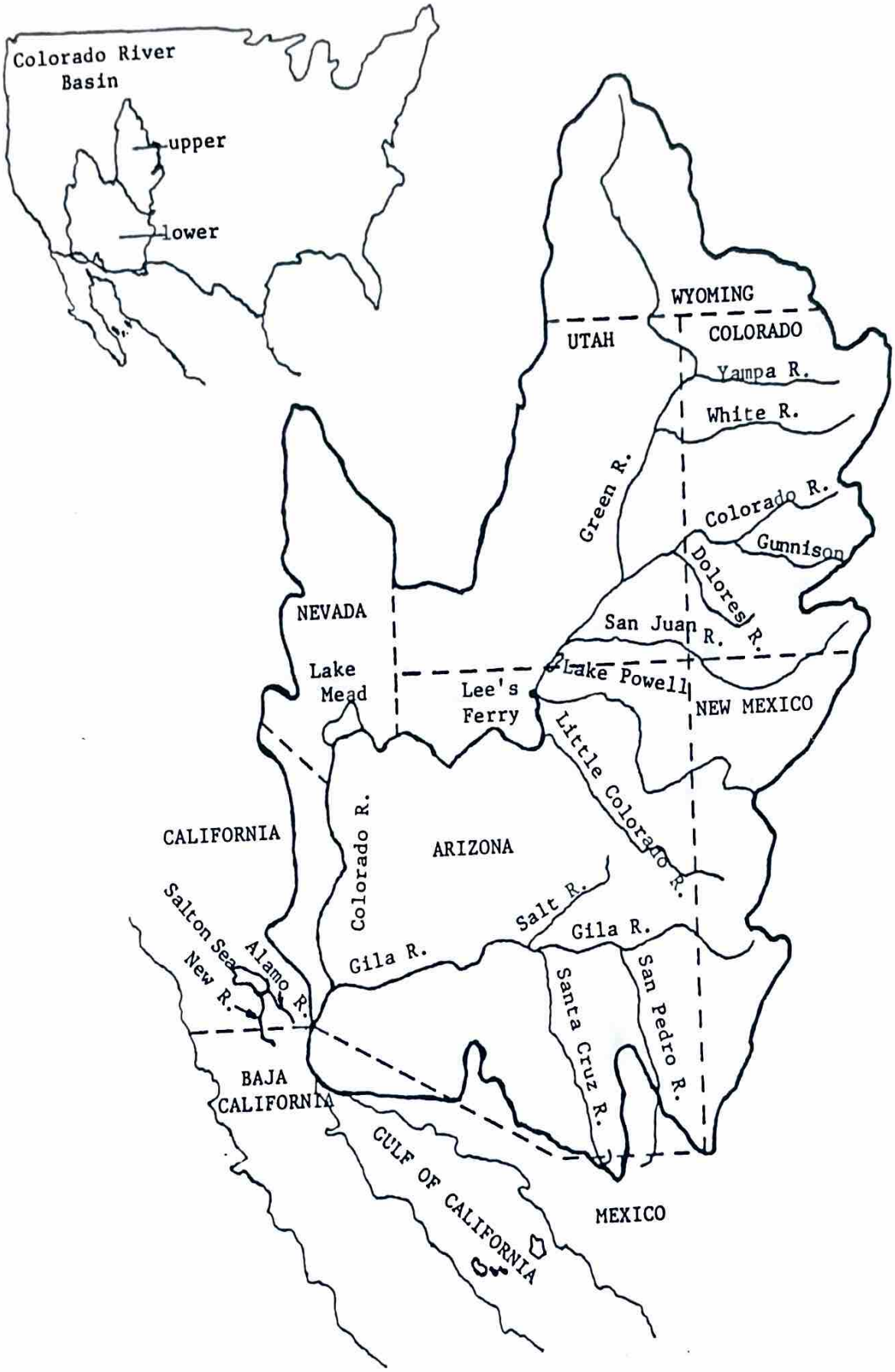
Clark, Charles T., et al. Del Rio, Border of Texas Industrialization. Austin: The University of Texas, Bureau of Business Research, 1964.

Day, John C. "International Aquifer Management: The Case of Hueco Basin on the Rio Grande River." Natural Resources Journal, 15, No. 1 (1975), pp. 163-180.

Furnish, Dale Beck and Jerry R. Ladman. "The Colorado River Salinity Agreement of 1973 and the Mexicali Valley." Natural Resources Journal, 15, No. 1 (1975), pp. 83-107.

U.S. Statutes at Large, 7th Cong., 1st sess. Part 2. Washington, D.C.: Government Printing Office, 1946, pp. 129-1267.

Wyman, Donald L. The United States Congress and the United States Policy Towards Mexico. Working Papers in U.S.-Mexican Studies, No. 13, San Diego: University of California, San Diego, 1981.



COLORADO RIVER BASIN

II. THE COLORADO RIVER AND THE COLORADO RIVER COMPACT OF 1922

In this section I will discuss the physical characteristics of the Colorado River, its history in respect to the Colorado River basin states, and the events which culminated in the Colorado River Compact.

The Colorado River originates in the Rocky Mountains of north central Colorado. Snow and seasonal rains provide the main source of the stream's flow. The river eventually drains in the Gulf of Mexico, the Rio Grande, and the Pacific Ocean. However, before reaching these destinations it makes its journey through the most arid and semi-arid regions of the United States and Mexico.

From the Rockies, the Colorado flows to western Colorado and Utah. At this point it merges with three principal tributaries - the Green River of Wyoming, the Gunnison River, and the San Juan River. Further downstream through New Mexico, Utah and Arizona, the Colorado comes upon a steep canyon near Lee Ferry, Arizona which divides the river basin. After this division, the Colorado passes through Nevada and Arizona where it forms a portion of the Nevada-Arizona border. The Gila River in Arizona is a significant tributary, but it principally provides drainage for south central Arizona. As the river continues, it makes up the entire border between California and Arizona. California and Mexico do not provide the Colorado with tributaries.

Passing through California's Palo Verde Valley, the Colorado approaches its delta, which is a flat alluvial deposit between

diverging branches of the mouth of the river. The delta includes the Coachella Valley and Imperial Valley of California, and the Mexicali Valley of Mexico. The Salton Sea is also located in this area, which was called the Salton Sink prior to the 1905 flood. It is considered part of the delta even though it is located north and west of the river's channel. Though the soil is rich here, it is climatically a desert - rainfall is less than two inches a year and temperatures can go over 120 degrees Fahrenheit (Hundley, 1966:12).

Although the Colorado is not a heavy flowing stream, it provides for an area of approximately 242,000 square miles (Meyers, 1967:486). The average precipitation for the whole basin is only fifteen inches and almost 90% of that evaporates before reaching the river channel. Under natural conditions the river does not have defined banks. It spreads into various small streams which tend to jump the banks and cause flooding. The occurrence of flooding stems also from the large amount of silt that the tributaries contribute. Under natural conditions, almost 140,000 acre-feet* of silt is carried to the Gulf of California each year (Hundley, 1966:14). Nevertheless, the silt is what creates the rich soil in this region.

The first attempt to use the river for irrigation purposes was in 1896 by the California Development Company (Hundley, 1925:20-37). The Imperial Valley was the area pinpointed as a great potential for agricultural activities. A well known

---

*The amount of water required to fill one acre of land to the depth of one foot.

engineer, George Chaffey, saw the possibility existed through the diversion of the Colorado River in Mexico's Alamo. It was also necessary to engineer a way by which this Company could secure the use of the Alamo in order to build a canal.

The United States was up against the legal system in Mexico which did not allow foreigners to own land near the international boundary. They ingeniously circumvented this legality by the creation of a Mexican Corporation - La Sociedad de Irrigacion y Terrenos de la Baja California S.A. in 1898. This corporation had the canal built by the time the Mexicans knew what had happened. The government of Porfirio Diaz demanded half of the water being diverted to go to the Mexican government in return for the use of Mexican territory. By June 21, 1901, the Imperial Valley received its first water from this canal. Thus, the Colorado River was successfully diverted through the use of the Alamo Canal.

The provisions by which the Mexican government agreed to allow the Mexican Corporation to exist under American auspices, clearly gave Mexico potential control of the farmers in the United States. Two provisions were especially causing resentment - prohibiting the subsidiary to sell or mortgage the company to any foreign government or to appeal grievances to a foreign government. Nevertheless, it was becoming clear to both the United States and Mexico that a treaty would be a way to secure a permanent solution to the water problem. In 1905 the United States communicated to the Mexican government its consideration to draft a treaty where the Colorado River would be

apportioned (Hundley, 1966:38). However, in this same year nature took control of the situation.

The California Development Company failed to provide the Mexican intake with an adequate headgate. Thus, as a result of unusually heavy rains, the river jumped its banks at the intake in Mexico and virtually ran out of control. The United States was placed in an awkward situation as the question of responsibility for the costs of this damaging situation came to the forefront. The California Development Company did not have the resources to effectively manage this catastrophe and was forced to turn over its stock to the Southern Pacific Railroad. In the crisis, the President of Southern Pacific, E.H. Harriman, pumped all his resources to work on the crisis but his efforts were simply not enough. E.H. Harriman then turned to President Theodore Roosevelt in request for aid. Initially, the U.S. President could only offer engineers for consultation. Since the break did occur in Mexico, Roosevelt had to have Mexico's permission in order to take action. He immediately sought that consent. He easily obtained it since Mexico felt the same desperation. Roosevelt saw the need for a treaty and hoped to be able to have control of diversion facilities on both sides of the border (Hundley, 1966:38). Believing that their sovereignty was at stake, Mexico was repulsed by such an idea. Mexico's reaction combined with the termination of the crisis, tabled any movement in the direction of a settlement between the two countries for the time being.

Soon the involvement of the United States federal government became an important factor. President Roosevelt promised Harriman public funds and wanted to examine alternatives to this situation whereby the United States was dependent on a foreign government for a resource as crucial as water. The problem now had gone beyond the resources of the private enterprise. Both Harriman and the federal government had invested money to renovate the Alamo Canal while on the Mexican side of the border, a U.S. newspaper publisher, General Harrison Grey Otis, his son-in-law Harry Chandler of California, and other partners who were also citizens of the U.S., had secured ownership of large amounts of land in the area benefiting from the diversion.

The potential for flooding still existed, and the erratic fluctuations of the river flow made construction of storage reservoirs a necessary consideration. Because these projects are costly, the involvement of the federal government became even more crucial. It became clear that before a treaty with Mexico could be realized, it would be necessary for the Colorado basin states to agree on the division of the regulated water.

In 1921, Secretary of Commerce, Herbert Hoover, who was also a prominent engineer from California, was elected Chairman of the Colorado River Commission. He had a difficult task ahead of him - to divide the Colorado River among the seven basin states. In 1922 representatives from Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming met in Santa Fe, New Mexico to do just that. It is important to note that although Herbert Hoover as chairman was to assist the states

with their regional interests in negotiating a settlement, he was also there as a representative of national interests. To facilitate the division, the states organized themselves into the Upper Basin and Lower Basin groups. The Lower Basin consisted of Arizona, Nevada, and California while the Upper Basin was made up of Utah, Wyoming, Nevada and Colorado.

The area encompassing the Lower Basin had developed first and seemed to be consistently developing far more rapidly than the Upper Basin. This interstate situation is interesting in that international streams face a similar situation of disputes, whereby the upstream users feel they need security from the potential monopolization of water by downstream users. By establishing use of a particular amount of water, the downstream users are able to establish a right to such water which would therefore preclude the use of such water by upstream users. In this situation, the downstream users of the Lower Basin faced threat of a cut off of the water supply since the river originates in the Upper Basin. Therefore the Lower Basin states also needed to have the security of a guaranteed water supply (Le Marquand, 1977:10-11). These circumstances presented a situation as one which could most effectively be solved by an agreement. Even with the time-consuming negotiations required to reach such an agreement, it is the more preferable alternative in the interest of maintaining an environment of goodwill among the states. A solution achieved by approaching the court system, would more than likely, in the long run, create more hostility and animosity.

In fact, one of the major obstacles confronting the basin states was this aspect of laws. There are significant variations in water law among the different basin states, and a complete lack of interstate water law. Issues regarding international water law and the jurisdiction of the federal government further confused the legalities. In 1848 when the United States acquired the Southwest, the Mexican water law existed whereby water belonged to the national government. Congress did not take any initial action to establish a uniform system of law. Although it is hard to know if such a possibility even existed. In 1866, federal legislation was passed which placed the burden of the determination of water rights on the local governments which would be reinforced in the court system if necessary. By the twentieth century the states had secured complete control over water allocation.

One of the most critical differences in water law can be illustrated in the case of California. The state of California operated on a dual system of water law - the common law system of riparian rights and the doctrine of prior appropriation. The first legislature of California in 1850 was impressed with the success of the common law system in England and the eastern United States, and decided that its success could also be realized in California. Ironically, there seems to have been a lack of knowledge of the geographical differences between California and England or even California and the eastern United States. If this knowledge was present it was certainly not considered in their decision. To the owners of the land which bordered a

river, the common law system guaranteed the right to the full flow of water minus an allowance to upstream users for domestic and livestock purposes. Hence, water rights are concurrent with land ownership, although the landowner did not own the stream itself.

The discovery of gold in the 1850's brought into question the ability of the riparian system to meet the diverse needs in the state. Large amounts of water were needed for gold mining. Because the miners were located beyond the reaches of established law, they soon devised their own system of regulation to meet their particular needs.

First, they assumed that natural resources such as gold did not belong to any single person and therefore free to be taken arbitrarily. Mining rights were determined on the basis of priority in which "first in time is first in the right" (Meyers, 1967:505). These principles were applied to water as well. Hence, the first one to take water form a stream had the priority of right so long as the water was used beneficially. By detaching water rights from the land, these rights then had the potential to be considered as personal property which thereby could be bought and sold without any regard for the land. When mining practices were finally given legal sanction, both systems of water regulation were in use and given recognition.

As times changed and agriculture became important to the state's economy, conflicts began to arise due to the establishment of the dual system. In areas where there was little rainfall, water had to be diverted from streams. This practice

denied downstream users the full flow of the stream which violated the riparian system. In 1866 the courts settled this issue in the case of Lux v. Haggin (Hundley, 1975:69-71). The court placed the riparian doctrine as the predominant system while being careful not to explicitly reject the doctrine of prior appropriation. Ultimately the riparian system was supreme, but was subject to appropriations which were done before the transfer of the title of the land. The courts also claimed that United States government was the supreme source of all water rights obtained on land which previously was of public domain. They reasoned that as the federal government was the original owner of public land, using the principle known as the "rights of absolute territorial sovereignty" established its possession of the water rights (Hundley, 1975:71). Since these rights were tied to the land, the Court established the riparian system. Thus the basin state of California began to be viewed with suspicion by the other basin states. As the largest, fastest growing basin state, California had the least amount of square miles located within the Colorado River Basin and had no tributaries contributing to it (Meyers, 1967:487).

The state of Colorado incorporated their approval of the doctrine of prior appropriation into their Constitution of 1896. This doctrine became known as the "Colorado Doctrine" as it spread and became established in the other basin states. This doctrine refused to recognize the federal government as the supreme holder of all water rights.

Although state officials could regulate water rights within their own borders, they were unable to use their authority to solve any problems relating to users outside their state boundary. This problem created a situation whereby the states were induced to act predominantly out of self-interest which set the stage for interstate conflict. The settlement of such disputes through the Supreme Court was not effective in decreasing such conflicts because its rulings, such as in the case of Kansas v. Colorado (Hundley, 1975:74-77), were ambiguous and did nothing to further the establishment of precedents for interstate water law. It is clear that the states did not trust each other and were becoming increasingly suspicious of the federal government.

The federal government was the largest landowner in the Colorado River Basin. It also controlled the licensing of hydroelectric power development. The government's other potential tool for control laid in the fact that thirty Indian reservations occupied the basin. Their obligation to protect the Indians' land and water rights could be exercised to the detriment of the interests of the states. But ultimately it was the location of Mexico at the lower river which would fortify the role of the federal government in the negotiations among the basin states.

The other side of the border was not oblivious to the activity following the creation of the Colorado River Commission. The Mexicans were anxious about their interests as well and requested representation of their needs on the Commission. However, the Department of State argued against their involvement on the grounds that the issue pertained only

to domestic matters. President Alvaro Obregón of Mexico decided he was not going to idly stand by while the United States determined Mexico's future. He created an agency called the Board of International Waters to study the problem of the Colorado River as well as the lower Rio Grande which was similarly problematic.

In spite of the many obstacles, the Colorado River Compact (U.S. Cong. House, 1923:8-12) was finally realized in 1922. It recognized the physical and political division between the Upper and Lower Basins as Lee Ferry, Arizona. The total runoff (which is the volume of water discharged from a river) was estimated to be 18,000,000 acre-feet with a surplus of 3,000,000 acre-feet. Recognition of California's potential need was acknowledged by temporarily allowing the Lower Basin to expand its uses to include 1,000,000 acre-feet from the surplus waters. Consideration of a future treaty with Mexico was another reason for the designation of this surplus amount. Although the Compact allocated water between the upper and lower portions of the basin, it did not specify the distribution of water for each state. This caused problems in getting the Compact ratified by the basin states. In addition, in 1922 the Supreme Court declared that priority of appropriation would be applied in any litigation between western states. Arizona refused to approve the Compact because they feared the advantageous position of California. Congress approved a six-state compact in 1928. It was not until 1944 that Arizona finally ratified it.

The difficulties encountered in the United States in negotiating the Colorado River Compact agreement are minute when compared to the obstacles that would face the United States and Mexico in achieving an international treaty. As more interests become involved, the complexities facing the negotiators are overwhelming, and the amount of time required to work through these intricacies tends to work against reaching an agreement.

Bibliography

Hundley, Norris. Dividing the Waters. Los Angeles: University of California Press, 1966.

Hundley, Norris. Water and the West. Los Angeles: University of California Press, 1975.

LeMarquand, David G. International Rivers. Canada: Westwater Research Centre, 1977.

Meyers, Charles J. "The Colorado River Basin." In The Law of International Drainage Basins. Ed. A.H. Garretson, R.D. Hayton and C.J. Olmstead. New York: New York University of Law, 1967, pp. 486-607.

U.S. Cong. House. Colorado River Compact. 67th Cong., 4th Sess. H. Rept. 605. Washington, D.C.: Government Printing Office, 1923.

III. THE COMPLEXITY OF EVENTS PRECEDING THE NEGOTIATIONS OF THE 1944 TREATY

I will discuss the complexity of events precipitating the negotiations between the United States and Mexico for the 1944 Treaty. After the United States had persistently pushed Mexico away from active participation in the settlement of the Colorado River Compact, it delayed negotiations as it wrangled with the basin states until a crisis situation in Mexico demanded the solution which only a treaty could adequately settle.

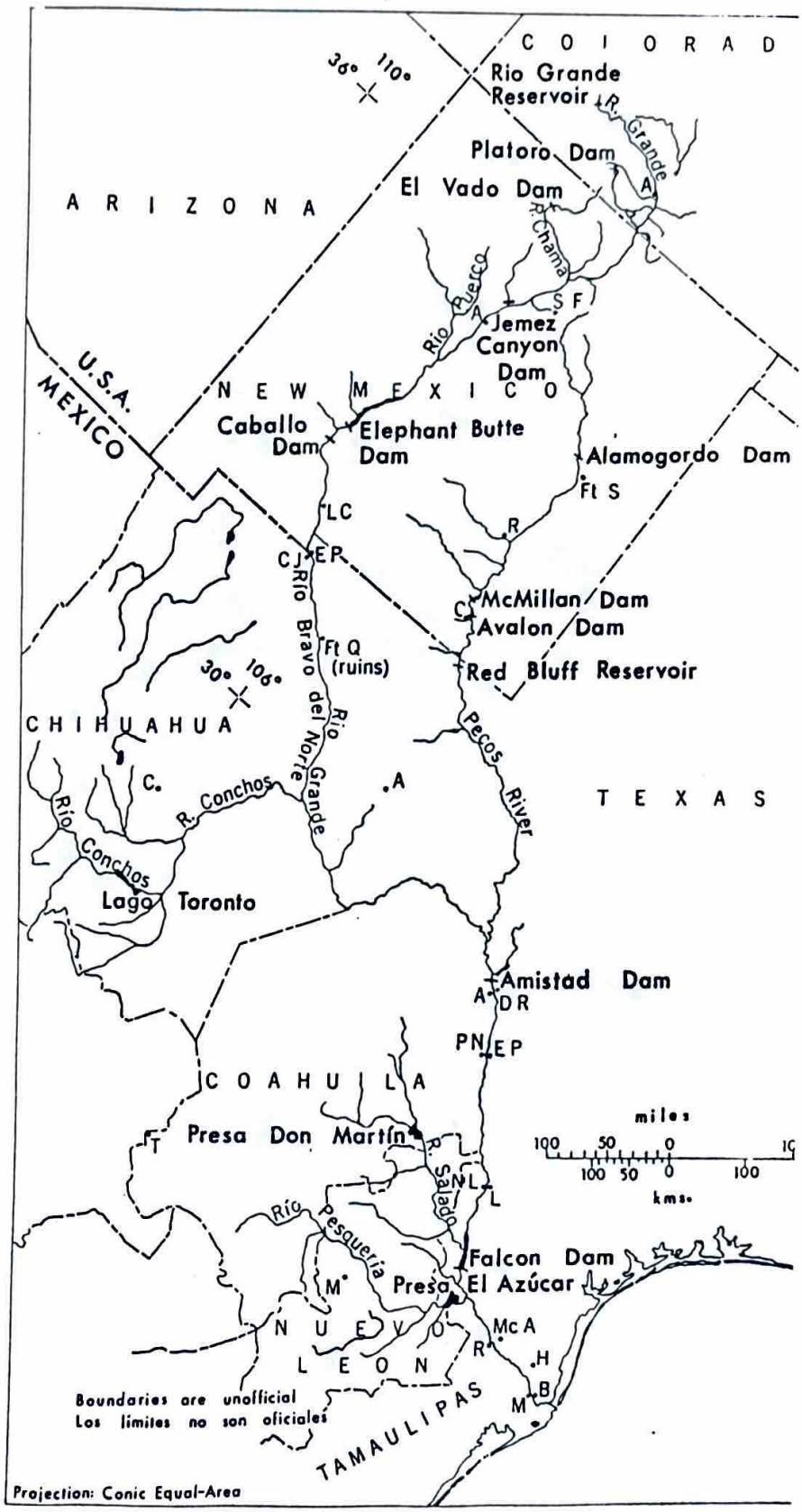
Water supply problems with Mexico stem from the 1848 Treaty of Guadalupe - Hidalgo which did not include any allocation or regulation of water. This is not surprising since there was little development along the river area. The main concern was instead for the rights of navigation. However, this treaty did establish the International Boundary Commission to supervise the fulfillment of the Treaty provisions.

In the beginning of the 1900's, the United States as the upstream user of the Rio Grande, began to increase its uses dramatically. Soon a water shortage was created in the Juarez Valley area. The International Boundary Commission met whereby a Mexican and a United States Commissioner negotiated an agreement. This 1906 agreement allocated the upper Rio Grande above Fort Quitman, Texas and authorized the construction of Elephant Butte Dam in New Mexico. It was obvious that the lower Rio Grande and Colorado would someday have to be similarly decided upon as population and agricultural activity increased along the

border zone. Nevertheless, this Treaty was an important step in fostering an optimistic attitude for future negotiations regarding boundary water. It is important to note, however, that the political context was not as complex in 1906 as it was to become by 1944. Naturally there existed the ever-present resentment of the United States as Mexico looked to the north in envy of such prosperity. But at this point, United States and Mexico had not yet experienced any major head-on collisions on issues pertaining to water resources.

In 1924 Mexico instituted irrigation projects on the Rio Grande. The State of Texas became alarmed with such activity. They wanted their interests protected. Congress acknowledged the threat posed to the U.S. farmers and responded by passing legislation in 1924. The act authorized the President to name three commissioners to cooperate with Mexican representatives in a study to collect data to aid in the distribution and regulation of the Rio Grande below Fort Quitman, Texas. Hence, the International Water Commission was established as the first Joint Commission to actually study such technicalities for this specific purpose.

In 1926 President Elias Calles of Mexico created the National Commission of Irrigation and secured the passage of legislation which would facilitate a more efficient administration of ejidos (communal lands), increase irrigation, and establish agricultural schools. Much of his interest focused on projects on the Rio Grande. Thus, the construction of a dam was undertaken on Rio Salado, while plans were being developed for a dam on the San Juan River and canals on the Conchos.


C O L O R A D
Rio Grande Reservoir
R. Grande
Platoro Dam
El Vado Dam
A R I Z O N A
R. Chama
Rio Puerco
Jemez Canyon Dam
U.S.A.
MEXICO
N E W M E X I C O
Caballo Dam
Elephant Butte Dam
Alamogordo Dam
Ft S
LC
EP
McMillan Dam
Avalon Dam
Red Bluff Reservoir
Ft Q (ruins)
Río Bravo del Norte
Rio Grande
Pecos River
CHIHUAHUA
C.
R. Conchos
Río Conchos
Lago Toronto
T E X A S
Amistad Dam
DR
PN
EP
C O A H U I L A
Presa Don Martín
Río Salado
Río Pesqueria
Falcon Dam
Presa El Azúcar
N U E V O
L E O N
McA
H
B
M
TAMAULIPAS
miles
100 50 0 100
kms.
Boundaries are unofficial
Los límites no son oficiales
Projection: Conic Equal-Area

Meanwhile the Texans were becoming increasingly anxious. Their voices were growing in numbers as real estate operators, under the assumption that plenty of water was available, had sold large tracts of land in this area. Once again they were successful in airing their grievances to Congress, who in turn went to President Hoover and urged him to open up negotiations with Mexico. Hoover had just recently returned from a tour through Latin America to promote his Good Neighbor Policy. The United States' commitment to settling differences in the Western Hemisphere through joint consultation was the major concern of this policy (Kelley, 1982: 641-642).

It did not take long for Mexico to realize that it could strengthen its bargaining position by demanding that both the lower Río Grande and the Colorado be considered in one agreement. While the United States held the advantage on the Colorado, most of the Río Grande was composed water from Mexican tributaries. Secretary of State Charles Hughes was reluctant to include the Colorado River because the basin states were still quarreling over the 1922 Colordo River Compact (Hundley, 1966:58-59). However, Mexico's willingness to consider an agreement prompted Congress to pass a joint resolution whereby the 1924 act was broadened to include the Colorado River and specified that both rivers be considered for one treaty.

Concurrently, those with interests lying in the San Diego area were pushing to include the Tijuana River in the negotiations. The Department of State agreed to consider the Tijuana if Mexico also agreed, and ultimately only if it did not stand

in the way of a settlement of the Colorado and lower Rio Grande rivers. The consideration of the Tijuana did not become an issue of conflict, thus all three international streams were considered for one treaty. Already we can see how the different interests must be placated to the extent that an agreement to negotiate a treaty be achieved.

In 1928 the Boulder Canyon Project Act was passed which authorized the construction of the Hoover and Imperial Dams, and the All-American Canal (United States Statutes at Large, 1929:1057-1066). The Imperial Dam was used to divert water from the Colorado into the All-American Canal. As its name declares, this canal was to be built entirely in the United States to serve the Imperial Valley area. The Boulder Canyon Project Act demonstrated that the United States was moving ahead on reclamation projects to secure its superiority on the Colorado River.

As of yet, Arizona had not ratified the 1922 Colorado River Compact because they did not feel that they were not adequately protected from California's potential for monopoly of the water allocated to the Lower Basin. The construction of projects as per the Boulder Canyon Project Act would facilitate an even more rapid expansion of California's Coachella and Imperial Valleys. However for Arizona, these projects would not offer any benefits due to reasons of topography (Hundley, 1966:61). As these projects materialized, the fear of the potential threat California posed to the other Lower Basin states as well as the Upper Basin States was prevalent. Arizona believed that its water needs were only recognized after the Upper Basin and California got

their share of the water. And now that the United States was considering Mexico, Arizona could only conclude that Mexico's needs would also take precedence. When the Boulder Canyon Project Act was initially proposed, there was some concern that Mexico would benefit form these projects at the expense of the United States. Thus Arizona hoped to thwart support for it by playing up the threat posed by Mexico. Although this strategy did not prevent the Act from passing, it alerted awareness to the potentiality of Mexico as a threat to United States' resources. Such a view of Mexico as on the part of the United States adversely colored the treat talks. This specific incident clearly illustrates the mesh of international and domestic elements which distinguishes policymaking on border issues.

The basin states wanted the Department of State to take a hard line approach with Mexico, especially, in terms of making it clear to them that any water made available to Mexico did not represent any recognition of any water rights being attributed to them. But the Department knew that such communication would work against creating a positive ambience for treaty-making. Nevertheless, California's Senator Hiram Johnson later added a significant provision to the Boulder Canyon Act which said that "nothing in this act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the waters of the Colorado River System," (Cont. Rec., 1929:pp. 474, 593) a statement which was reiterated during debates of the 1944 Treaty.

After engineering studies were completed by the International Water Commission in August 1929, Dr. Elwood Mead, Chair of the Commission in the United States, made a formal offer to Mexico. The offer entailed 750,000 acre-feet of water with an additional unspecified amount to be decided by United States Commission to make up for losses incurred in the main canal (House Documents, 1930:45). Mexico rejected this offer without hesitation and demanded 3,000,000 acre-feet. These two differing positions were based on two different views regarding the use of the Alamo Canal. The United States substantiated its offer on data which reflected the largest amount of water ever used by Mexico. This was hardly fair, since Mexico as a developing country had certainly not reached its potential of usage. Allocating water on such a basis could prevent its future development. Mexican negotiators based their demand on a contract with the California Development Company. Once again a U.S. state played a significant role in complicating negotiations between the United States and Mexico. In general, the basin states feared that the Colorado River would be bargained away in exchange for the Río Grande. They opposed such an exchange even in view of the blatantly evident threat to the State of Texas. Thus, this United States-Mexico confrontation caused a complete breakdown in the movement toward a treaty. Subsequently, the International Water Commission was abolished by the Economy Act of 1932 as part of the United State's effort to pull the nation out of an economic depression (United States Statutes at Large, 1933:399-419). The functions of the International Water

Commission were transferred to the American section of the International Boundary Commission.

The failure to reach an agreement placed the element of time as a major decisive factor in the negotiations. The delay allowed for the possibility of significant changes which could drastically change the bargaining positions of each country. For example, Mexico could build up its uses which would further agitate the Texans into pushing the U.S. Government to increase their original offer of Colorado water. By the same token, the United States could use this delay to enhance the efficiency of their existing projects and develop plans for new ones. Thus, one can see how the passage of time could allow for the manifestation of even more obstacles to hinder the attainment of a treaty.

In 1933 President Abelardo Rodriguez of Mexico established the Mexican Advisory Commission of International Waters. Under the Secretary of Foreign Affairs, this technical commission was composed of four lawyers and six engineers. In general, the Commission was to study Mexico's problems with international streams (Meyers, 1967:540). In August 1933 the Committee met with the Secretary of Foreign Affairs. Their report was unique in that, thus far technical reports done on either side of the border did not focus on the concept of a shared border area artificially divided by politics. It presented the alternative whereby both governments should view the international water problem in terms of the unique needs of the shared border zone. As stated in the report, "both governments should recognize the

area as a single agricultural region with similar interests closely linked and interdependent; that taking these considerations into account, both states considering the problem as referring to geographical unity, with common interests to be protected through a settlement that guarantees, according to a reasonable and equitable apportionment, the agirulcutlra and industrial development of bordering zones." (Meyers, 1967:540-541). The needs of those inhabiting the border zone are more closely shared than the needs of the respective governments. The United States and Mexico tended to place too much weight on their particular differences such as their obviously contrasting economic situations. This approach tended to breed even more separateness. Therefore, the Mexican report was instrumental in exposing a perspective of a common interest which could provide the groundwork to deal with the water issue as well as other U.S.-Mexican issues which largely stem from the border area.

In 1934 Lázaro Cárdenas became President of Mexico with the support of former President Calles. Cardenas' objectives for Mexico affirmed his belief that agriculture was the key to Mexico's prosperity. One of the highlights of his program was the establishment of financial institutions to issue credit to the farmers themselves.

It soon became evident that irrigation projects already underway on the lower Río Grande were using large amounts of water, and Mexican engineers were busily devising plans for more of these projects. One plan entailed the construction of the Retamal Canal. The canal would draw upon the river north of the

lower Rio Grande Valley and bring water to this valley area. Thus, Mexico's control of the lower Rio Grande was being realized. The Retamal Canal could virtually divert the entire flow of the Rio Grande to Mexico.

Sumner Welles, the United States Under Secretary, proposed investigations to obtain technical data - the amount technical data. Specifically, the data was to reflect the amount of land being irrigated on both sides of the border, and the present use of water derived from the other country's sources. Francisco Castillo Najera, Mexico's ambassador, insisted that Mexico's future water needs also be considered in this study to facilitate apportionment. Mexico felt that their security for the future was paramount, therefore they did not hesitate to remind the United States of the fact that three-fourths of the Rio Grande flows from Mexican tributaries (Meyers, 1967:542).

In 1936 President Cardenas looked to the border zone as his focus to promote development. He believed that the distance of the border area from Mexico City kept it much too isolated, therefore an increase in Mexican population here could perhaps foster a stronger governing bond to the central power of government. Thus, he initiated a program which called for the resettlement of people from the crowded interior of the country to the border region of Baja California. Needless to say, behind these plans laid the persistent fear that the United States cold reach forth with its powerful colossus arm and squeeze these border areas into the United States.

In 1937 the U.S. government decided to open up negotiations with Mexico. The basin states were as concerned as ever about the operations of the Department of State in the protection of their interests. They were about how the impending treaty was becoming strongly associated with the Good Neighbor Policy which was being continued into Franklin D. Roosevelt's administration. Arizona, in particular, was worried about the surplus water referred to in the 1922 Colorado River Compact. Apparently, there was some question as to the validity of the measurements which established the surplus amount (Hundley, 1966:83).

In 1938 the Mexican government expropriated the developed lands that Harry Chandler and other U.S. citizens owned on the Mexican side of the border. United States petroleum holdings in Mexico were also expropriated. These issues of conflict loomed large in U.S.-Mexican relations. Thus,the water problem became a secondary issue for a time (Foreign Relations, 1940:1040-1048).

In the U.S., representatives from each Colorado Basin state met in Arizona. They discussed their representation in the U.S.-Mexico negotiations for a water treaty. Thus, they named two delegates from each basin state to a Committee of Fourteen to serve as the liaison between the Colorado Basin states and the federal government. A Committee of Sixteen was also created which included the representation of hydroelectric interests.

The U.S. Department of Interior undertook a thorough study of the Colorado River. Known as the Jacob-Stevens Report, this study took into consideration the expansion and development of the United States up to the year 2000. Hence, the Department of

Interior concluded that 1,585,000 acre-feet would be available to offer to Mexico (Hundley, 1966:91). According to the Report, this water would be largely composed of waste water returned to the river from irrigation projects in the United States. The Committee of Fourteen doubted that the basin states could actually produce such a large amount of waste water. California was especially adamant against any offer to Mexico which exceeded the original offer of 750,000 acre-feet. This basin state had received a provisional award of the surplus water as pursuant to the 1922 Colorado River Compact. However, California had come to depend on that water and now it feared the possibility of having to surrender it to Mexico.

The continuous anxiety of the Texans prompted studies of this region. By 1939 these studies were completed. The results was the proposal of a project to offset Mexico's Retamal Dam - the Valley Gravity Canal and Storage Project. This plan called for the construction of 169 miles of concrete canal running parallel to the Rio Grande on the Texas side and the erection of two storage reservoirs along the canal. It was determined that 400,000 acre-feet of water usually lost in episodes of floods, could be saved through diversion into the canal and impounded in reservoirs until needed (Hundley, 1966:95).

In 1940 the Department of State submitted a plan to the Mexican Embassy entitled the "Plan for Settling Outstanding Problems between the United States and Mexico," which requested that a detailed discussion of the water problem be postponed until "other political matters had been resolved," (Foreign

Relations, 1940:1050). Mexico understood this reference to other political matters to mean other problems between United States and Mexico. They were also offended by the United States narrowly viewing the problem as solely political, while for Mexico, there was a predominant economic perspective. Under-secretary Welles and other Department of State officers met with Mexican Ambassador Francisco Castillo Najera. Welles clarified his statement regarding "other political matters" which he said was a reference to the domestic political elements intertwined with this international problem.

It was difficult for Mexico to understand how these domestic political interests seemed to play such a powerful role in a supposedly international problem. The centralistic pattern of the Mexican government insured that the national government would pursue set lines of policy and act on behalf of the nation as a whole. The central government is considered the ultimate owner of all natural resources, therefore riparian rights have never existed in Mexico. The administration of water policy is carried out by the Ministry of Agriculture and Hydraulic Resources. The structure of the Ministry insures that policy formation follows the political objectives of the regime (Mumme, 1980:41-42). Thus, Mexico's more centralized nature of governing made it impatient with fragmentation exhibited by the United States which allowed for international concerns to become almost subservient to domestic issues. Mexico was never quite sure if perhaps the United States simply wanted to bide time and the domestic element was a convenient excuse.

Hoover Dam had been completed by 1935, the Imperial Dam in 1938, and the All-American Canal was ready in 1941. Farmers in the United States were relieved from their dependence on Mexico's Alamo Canal. The plan for the Valley Gravity Project was now well-known to the Mexicans. Then nature stepped in as a major factor in agitating a crisis situation demanding the immediacy of a settlement of a settlement.

In the spring of 1943 a severe drought occurred in the Mexicali Valley. Mexico was so desperate for water that it had to resort to buying it at outrageous prices from the Imperial Irrigation District. Mexico had no alternative but to seek help from the Department of State in the United States. This incident combined with the occurrence of a flood in 1937 put Mexico in a mood to aggressively pursue a settlement (Anderson, 1972:607-609). The Department of State was beginning to tire of the annoying involvement of California water and power interests. It seemed as though they always posed as an obstacle to international negotiations with Mexico because of their intransigence on demands for protection of their established uses of the Colorado. Mexico's need for a treaty was escalated by the occurrence of the drought. The United States saw that the crisis situation could force Mexico to be a more flexible bargaining partner. Finally, the Department of State was awakened to the opportunity by which they could satisfy domestic needs as well as the international problem with Mexico.

Bibliography

Anderson, Kirsten J. "A History and Interpretation of the Water Treaty of 1944." Natural Resources Journal, 12, No. 4 (1972), pp. 600-614.

Cong. Rec. 70th Cong., 2nd Sess. 1929, pp. 474, 593.

Foreign Relations of the United States. Vol. 5, 1940. Washington, D.C.: Government Printing Office, 1961.

Hundley, Norris. Dividing the Waters. Los Angeles: University of California Press, 1960.

Kelley, Robert. The Shaping of the American Past. 3d ed., Vol. 2. Englewood Cliffs, NJ: Prentice Hall Inc., 1982.

Meyers, Charles J. "Colorado Basin" In the Law of International Drainage Basins. Ed. A.H. Garretson, R.D. Hayton, and C.J. Olmstead. Dobbs Ferry, NY: New York University School of Law, 1967, pp. 486-607.

Mumme, Stephen P. "U.S.-Mexican Groundwater Problem." Journal of Interamerican Studies and World Affairs, 22, No. 1 (1980), pp. 31-35.

U.S. Cong. House Documents. 71st Cong., 2nd sess. H. Rept. 359. Washington, D.C.: Government Printing Office, 1940.

U.S. Statutes at Large. 70th Cong., Vol. 45, Part 2. Washington D.C.: Government Printing Office, 1929.

U.S. Statutes at Large. 72nd Cong., Vol. 47, Part 1. Washington D.C.: Government Printing Office, 1933.

IV. THE 1944 TREATY

I will discuss the ratification of 1944 Treaty by the Colorado River basin states, the United States and Mexico. I will focus on the Treaty's lack of consideration regarding the specification of water quality offered to Mexico and the complete omission of groundwater.

In 1942 Mexican President Manuel Avila Camacho successfully resolved outstanding controversial issues with the United States, such as the expropriated oil interests, which helped to foster a more friendly relationship. After careful consideration, Mexico saw two ways by which to alleviate the situation of the farmers in the Mexicali Valley. It either had to persuade the United States to negotiate a treaty or demand a solution through arbitration. As far as an arbitration tribunal was concerned, it was hard to predict what the outcome would be. In the short run, it would likely resolve Mexico's immediate problem, but in the long run the relationship between the United States and Mexico would suffer.

Although the U.S. Department of State sensed a more cooperative spirit between the United States and Mexico, they were hesitant to act without the support of the Colorado basin states. For that reason, the Department scheduled a meeting with the basin states. Although the Arizona-California conflict was still at its height, the Department of State informed them of the unfavorable implications presented by an arbitration tribunal as opposed to the negotiation of a treaty. More

specifically, the Department of State was concerned that a tribunal might rule against the United States. In addition, the U.S. international image would be threatened if the United States refused to arbitrate or rejected an unfavorable tribunal decision. By this appeal, the Department persuaded the Committees of Fourteen and Sixteen to agreed to the opening up of negotiations with Mexico. Also a subcommittee was created called the Subcommittee of Seven. It was composed of one delegate from each state who would be sent to Washington where they would be directly involved with treaty talks.

By April 1943, the Department of State called a meeting of the Committees of Fourteen and Sixteen to discuss the proposed treaty. The treaty was drafted by representatives from the Bureau of Reclamation; Chairman of the Committee, Clifford Stone of Colorado; and the Director of the Colorado Water Conservation Board, Royce Tipton, also of Colorado. This proposal represented the most promising thus far, in terms of Mexico's willingness to accept it. It entailed an offer of 1,500,000 acre-feet with the possibility of up to 2,000,000 acre-feet. Approximately half of this amount would be composed of water diverted by a canal from the lower basin tributaries. The other half would come from any water arrivng at the boundary which would be primarily made up of return flow.* And if either of the Sources could provide more water than usual, then Mexico

---

*This term refers to water returned to its source after having been used in the irrigation procedure. Depending on the use to which it had been put, there may be a decrease in the quality reflected in the increased level of dissolved solids.

could increase its uses. By the same token, if sources fell short of flow,then Mexico would also have to accommodate accordingly (Hundley, 1966:126).

The Californians were the principal opponents of this offer. They believed that there was not sufficient return flow available to meet such obligations. Therefore, California's provisional use of surplus water by the Colorado River Compact of 1922 would be threatened. California was especially worried about its contractual obligations arranged by the Imperial Irrigation District. When Phil Swing, legal advisor to the District, confronted the American Boundary Commissioner, Lawrence Lawson and Department of State representatives on the potentiality of sacrificing California's contracts, Lawson asserted that there was sufficient water to meet these contracts. However, he also added that if the case came to be that this was not true, Mexico would be considered first (Hundley, 1966:127). What an insult to California!

One of the major arguments proposed by the Department of State regarding the issue of "return of flow" was that its quality would not be adequate for use by the basin states. E.B. Debler, an engineer from the Bureau of Reclamation, maintained that Arizona need not worry because the return flow would be too saline for its use anyway. Another engineer stated that Mexico might be able to use the return while the United States clearly could not (Hundley, 1966:127). This is the first evidence of concern for the quality of water in respect to the Treaty. The issue of the quality of water would become an increasingly

troublesome matter in itself. At this time it was more of a debate in passing as part of an overall attempt to assuage the basin states.

California consistently opposed the Department of State's proposal. All the basin states voted in favor of it except California and Nevada. Nevada's vote against it was by default, however, because the Nevada representative strangely did not arrive on time to vote (Hundley, 1966:128). For California, this was only the beginning of its isolation from the other basin states.

In 1943 Mexico suggested that both governments turn over the border problem to the International Boundary Commissioners, Lawrence Lawson of the U.S. Section and Rafael Fernández MacGregor of the Mexican section (Hundley, 1966:131). With this request, Mexico made it clear that it was not going to wait around while interstate conflicts in the United States dominated the issue. The final draft of the Treaty was formulated after four months of conferences in Juárez and El Paso. By the end of 1943 Lawrence Lawson made an offer acceptable to Mexico. It consisted of 1,500,000 acre-feet which would come from "any and all sources" (U.S. Statutes at Large, 1945:1237). The Mexicans would be allowed to increase their uses up to 1,700,000 acre-feet if the United States determined this was feasible.

Secretary of State Cordell Hull sought approval from the Committees of Fourteen and Sixteen. California stubbornly maintained its position against the treaty, while the other basin states even commended it. Nevertheless, the treaty was formally

signed on February 3, 1944 and now needed the approval of both the U.S. and Mexican federal governments.

By this time even Arizona came to the full realization, in marked contrast to California, that cooperation with the other basin states would strengthen their efforts to protect their interests against Mexico. This was further demonstrated by Arizona finally ratifying the Colorado River Compact of 1922 in 1944.

Meanwhile, California never stopped trying to seek support from the other basin states. Its legislature appropriated $75,00 for the use of lobbying and publicity (Hundley, 1966:140). The California press twisted and turned the issue to provoke emotions of national pride. By playing on the nation's wartime sentiment, it tried to tie it to the issue of national security. World War II veterans were to be recipients of land which was located in the Colorado River basin area. Hence, California tried to establish that the federal government was dishonoring veterans by putting them out to suffer in the desert. Interestingly, Nevada finally joined California in their fight. It is hard to say exactly why they decided to join California, except that it is a fact that Nevada did get its water and power from facilities located either on the California-Nevada or within California itself.

On January 22, 1945 the Senate hearings for the U.S.-Mexico Treaty were launched and lasted for a month. California was eager to plan how it could effectively carry on its fight within the context of these hearings. About one-third of those

testifying were representatives of California. Besides the strong presence of California's opposition in these hearings, there was an even stronger proponent in the person of Senator Thomas Connally of Texas.

Connally was a respected member of Congress since 1917 and was also presently serving as the Chairman of the Foreign Relations Committee. Thus, he was especially sensitive to the international implications presented by the Treaty. Coming from Texas, he represented his constituents' concerns for a settlement of the lower Rio Grande. But Connally had invested much time in his representation of the spirit of the Good Neighbor Policy. In 1943 the Connally Resolution was passed which asserted the necessity of an international authority to preserve peace. Presently, he was in the midst of plans to go to Mexico for the signing of the Act of Chapultepec. The United States was participating in this pact with other American republics to secure mutual defense. Thus, Connally represented a powerful element in advocating the Treaty.

As the Treaty was examined in the hearings, facts and figures upon which it was based were carefully scrutinized. The Treaty's proponents based the offer to Mexico onthe average flow of Colorado to be 18,000,000 acre-feet (Hundley, 1966:162). However, this figure did not account for the occurrences of droughts. Representatives from the Bureau of Reclamation predicted that a drought could limit releases from Hoover Dam to the extent that the needs of the lower basin states could not be satisfied. Therefore the treaty makers had insisted upon this

insertion in Article X that "In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet a year, the water allocated to Mexico .... will be reduced in the same proportion as consumptive uses in the United States are reduced." (U.S. Statutes at Large, 1945: 1237-1238). However, this clause lacked precision in respect to its administration. Who actually is responsible for determining what constitutes the said "drought" or "serious accidenit" is not specified. Therefore assumptions come into play to fill such a vacuum. Since the Colorado does originate in the United States, the U.S. assumed that they would decide when a drought occurred. They also interpreted the drought to mean that it was not necessary to be a full-fledged drought, as a drought in one area of the basin was sufficient to be covered by the clause. The Mexicans, on the other hand, interpreted it to mean that a generalized drought was necessary to be subject to the clause.

There also existed much controversy over the aspect of "return flow." Treaty advocates asserted that two-thirds of the 1,500,000 acre feet was to be composed of return flow. The United States wanted to be certain that all return flow going to Mexico was credited to their obligation to Mexico. This aspect touches off the renewed question of water quality. There are several provisions which stipulate that Mexico's allotment would come "from any and all sources" (U.S. Statutes at Large, 1946:1237), "any other quantities arriving at Mexican points of

diversion" (U.S. Statutes at Large, 1946:1237), "such waters should be made up of the said water, whatever their origin" (U.S. Statutes at Large, 1946:1238), which are all characterized by ambiguity. Thus, there is complete omission of a stipulation specifying water quality. Even in Article III which establishes the priorities of water usage in respect to the various possible uses, there is no clue to the quality of water. This is especially troublesome in respect to agriculture uses since different soils and crops may require a particular quality of water. Nevertheless, it is difficult to conclude what exactly the United States sought to gain by such vagueness of phrasing. It is possible that it was a strategy to secure credit for all the return flow going to Mexico or to disclaim responsibility for the quality of water going to Mexico. although the Senate hearings reveal that Mexico objected to the omission of water quality specification, the Treaty passed through both the United States and Mexican senates without the rectification of this omission. The Mexicans assumed, of course, that the water would be usable.

The administrative part of the treaty was contained in Article II. Pursuant to this Article, the International Boundary Commission was renamed the International Boundary and Water and assigned specific duties. The Commission was given the status of an international body consisting of a Mexican section and a U.S. section, each with an engineer as the commissioner. Each section of the Commission was ultimately responsible for the application of the Treaty and the settlement of any disputes

over its provisions. Each section of the Commission was considered an agency of its respective government through the U.S. Department of State and the Mexican Ministry of Foreign Relations. This is the only bilateral commission established by treaty (Mumme, 1984:116). The jurisdiction of the Commission is defined as extending to the areas contiguous to the international border sections of the Rio Grande and the Colorado Rivers, to the land boundary between the two countries, and to the works on their common boundary, with each section of the Commission retaining jurisdiction over those parts of the works located within its own country. Although the Treaty depicts a Commission of a technical and apolitical nature, it is rather impossible for it to be completely divorced from the political views of each section's respective government and the border zone itself. Unfortunately, its responsibilities are not specifically articulated in view of the variety of water-related problems it could confront. In one sense, its responsibilities are left open whereby they can have control over determining what issues are pertinent to their objectives, but at the same time their responsibilities are also left open to be contested.

In addition to the problem of water quality, the issue of groundwater did not become an important consideration during negotiations. In the Senate hearings, Royce Tipton testified that if the United States included water which was specifically labeled from groundwater sources in Mexico's allocation, they would be promising a resource which is easily depleted and therefore Mexico would have a claim against the United States to

recharge these waters. Also, there was an evident lack of knowledge regarding the amount of ground water in each country (U.S. Cong. Senate, 1945:1218-1219). Thus, to work through the allocation of groundwater would complicate the Treaty at hand.

At this time, groundwater was not understood to be part of the functioning of the hydrological cycle. This ignorance of groundwater combined with the omission of surface water quality in the Treaty, worked to create the crisis situation eventuated in 1961 when the Wellton-Mohawk Irrigation District located in Southern Arizona was completed.

Although the United States and Mexico ratified this Treaty, both countries shared in the divergence of opinion on many of the Treaty's important points. They each interpreted the provisions as such that were favorable to their desires and therefore ratified it on the basis of such interpretations. Nevertheless, there was the feeling on both sides of the border that the Treaty was a reflection of larger concerns and therefore local concerns had to be somehow overlooked for the time being.

Bibliography

Hundley, Norris. Dividing the Waters. Los Angeles: University of California Press, 1966.

Mumme, Stephen P. "Regional Power in National Diplomacy: The Case of the U.S. Section of the International Boundary and Water Cmmission." Publius: The Journal of Federalism, 14, No. 4 (1984), pp. 115-135.

U.S. Cong. Senate, Committee Hearings, 79th Cong., Vol. 749, Part 4. Washington, D.C.: Government Printing Office, 1945.

U.S. Statutes at Large. 7th Cong., 1st Sess. Part 2. Washington, D.C.: Government Printing Office, 1946, pp. 1219-1267.

V. COLORADO RIVER SALINITY CRISIS

In this section I will discuss the problem of water salinity, the Colorado Salinity Crisis and how the International Boundary and Water Commission acted to rectify the situation.

Salinity has and always will be a major threat to the future of irrigation agriculture. A properly managed irrigation project requires the use of large amounts of water in order to flush out the salts which are present to a certain extent in both water and soil in various amounts. Thus, the higher the proportion of salts, the higher the salinity, and, therefore, indicative of low quality water. All irrigation water contains such salts, and different plants are sensitive relative to the varying quantities of salt; however, plants have a limited capacity to extract the water and reject the salt. If the degree of salinity is too high for a plant, it will not survive.

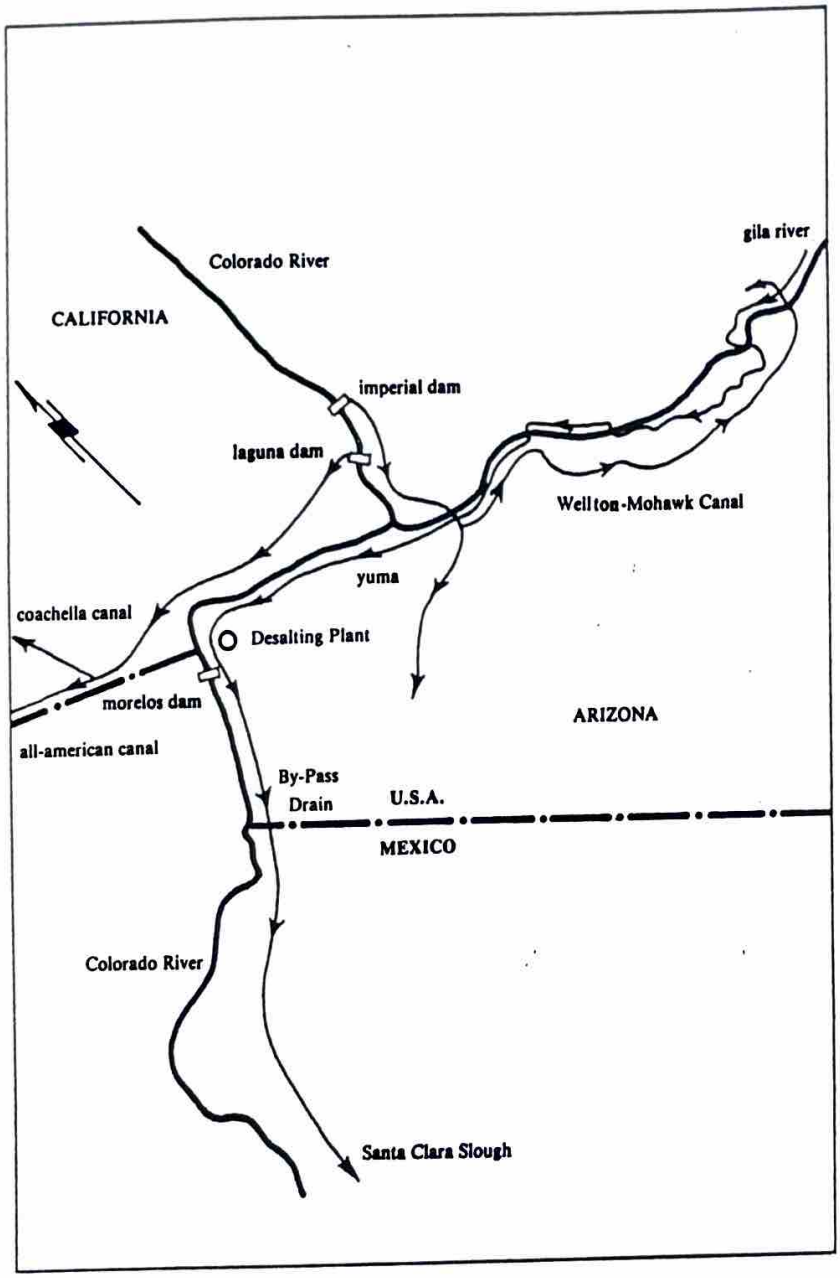
The plants' rejection of the salt causes the salt to be deposited in the soil. Once there is considerable accumulation, the plants encounter difficulty in separating the water from the salt. With the present irrigation techniques, over-irrigation is the course of resolution. The water of this excess irrigation dissolves the salts and lifts it out of the soil to be carried off as drainage water. The salinity of the drainage is, of course, much higher than that of the irrigation water. Hence, the greater the volume of water is required to carry away the salts. The quantity of irrigation water required to grow a particular crop must take into account the water actually used by

the land itself for its nourishment, amount of evaporation and seepage losses, and the volume of excess irrigation water required to maintain the saline balance of the soil. The optimal use of water requires that as little drainage water as possible be produced. In most cases, the drainage water is so highly saline that it is useless for irrigation.

The Colorado River is saline in its natural state. As its water is increasingly used, salinity concentrations have concurrently decreased. Since the apportionment of the river, it has been documented that the actual flow of the river is less than the original estimates. This was one of the most prevailing fears exhibited in the negotiations of the 1922 Colorado River Compact and the 1944 Treaty. The average recorded flow between 1896 and 1972 was 14,795,000 acre-feet. The water allocation in the Compact and the Treaty come to a total of 16,500,000 acre-feet (LeMarquand, 197:29). Thus, this inaccurate estimate will reflect in the intensive use of the existing 14,795,000 acre-feet which will be compounded as the upper basin states come to fully utilize their portion. The increasing demands of growing populations in the border areas indicates strongly the necessity of a comprehensive salinity control program in the immediate future.

Between 1945 and 1961, the salinity of water being delivered to the northern area of the boundary to Mexico was around 100 ppm (parts per million) of the water located in the United States Imperial Dam (Holburt, 1975:14). In 1947 the Wellton-Mohawk Project in Southwestern Arizona was authorized by Congress

WELLTON-MOHAWK SALINITY CONTROL PROJECT



Source: USBR, 1973

to deliver water for the irrigation of 75,000 acres. It was finished in 1952, but because of controversy over the high cost of the project, drainage provisions were not included. However, drainage problems became crucial as the water rose to the root level.

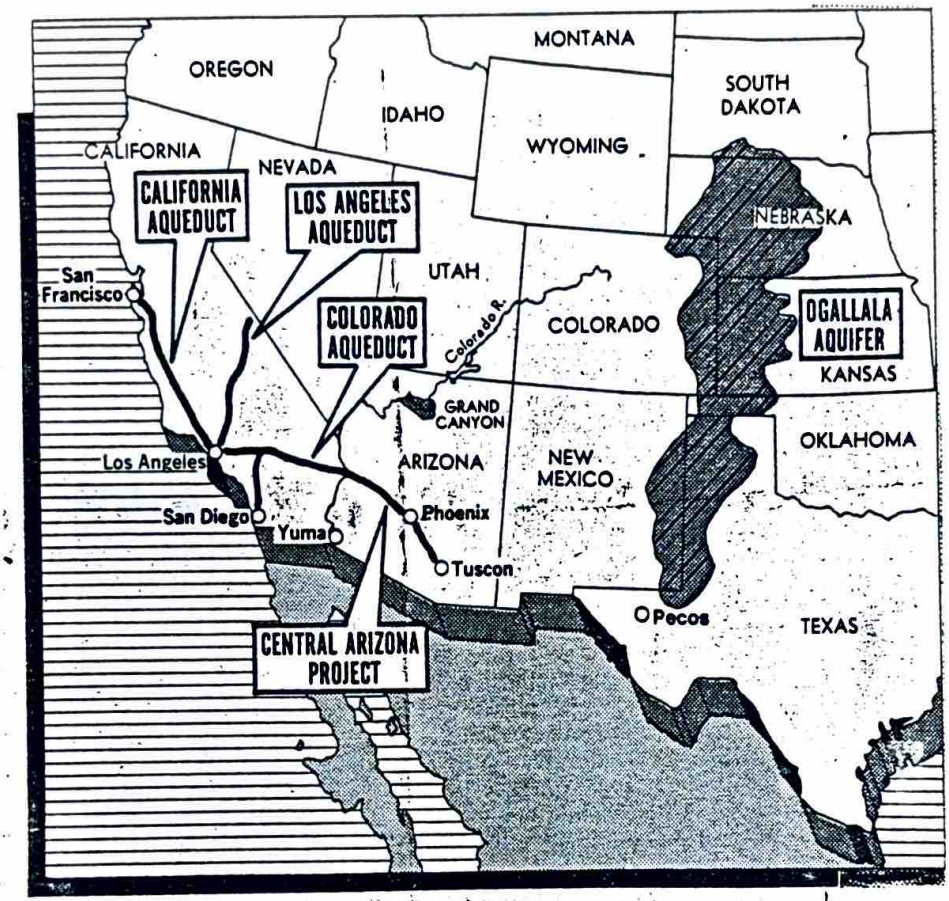
The considerably high level of salinity of the drainage water is due to the particular hydrological characteristics of the district and early irrigation practices. In the 1920's and 1930's, groundwater pumping was used to irrigate about 11,000 acres (LeMarquand, 1977:30). The irrigation water that did not evaporate returned to the ground. The salts in the water were concentrated in the now decreased amount of groundwater. Other developments prevented the replenishment of the groundwater.

Congress appropriated funds to built a drainage system which was completed in 1961. The drainage system worked to save the Project; however, the use of the wells drilled near the border to intercept water for Arizona also supplied the subterranean currents to the Mexicali Valley. Thus this drainage water was subsequently delivered to this valley.

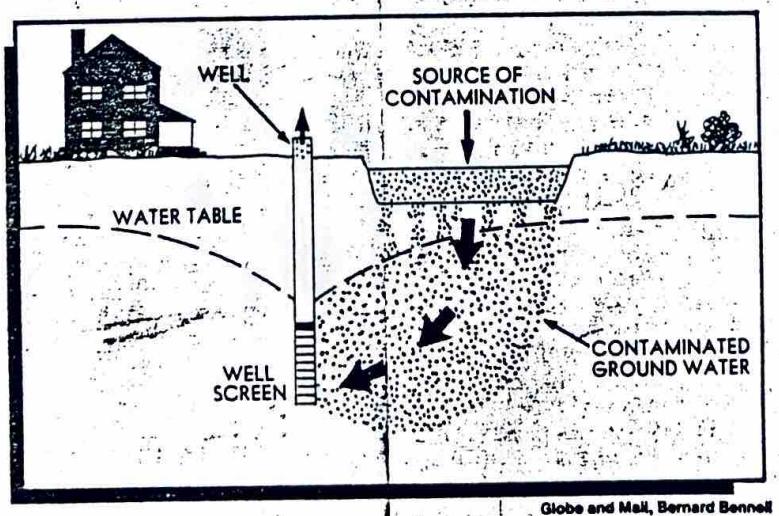
The Mexicali and San Luis Valleys* are an extension of the Imperial Valley in California. The agricultural production of the Mexicali Valley was superior to the rest of Mexico, however, at a relatively high cost. The main crops were cotton and wheat. Economic growth in this area has been overwhelmingly tied to local agriculture (Vela Salgado, 1975:130).

---

*Hereafter referred to as Mexicali Valley unless specifically referring to San Luis Valley.



Map (above) shows location of water systems in arid U.S. Southwest. At right, a stretch of the Colorado River Aqueduct crosses the Mojave Desert in California. Below, illustration shows how contamination reaches drinking water.



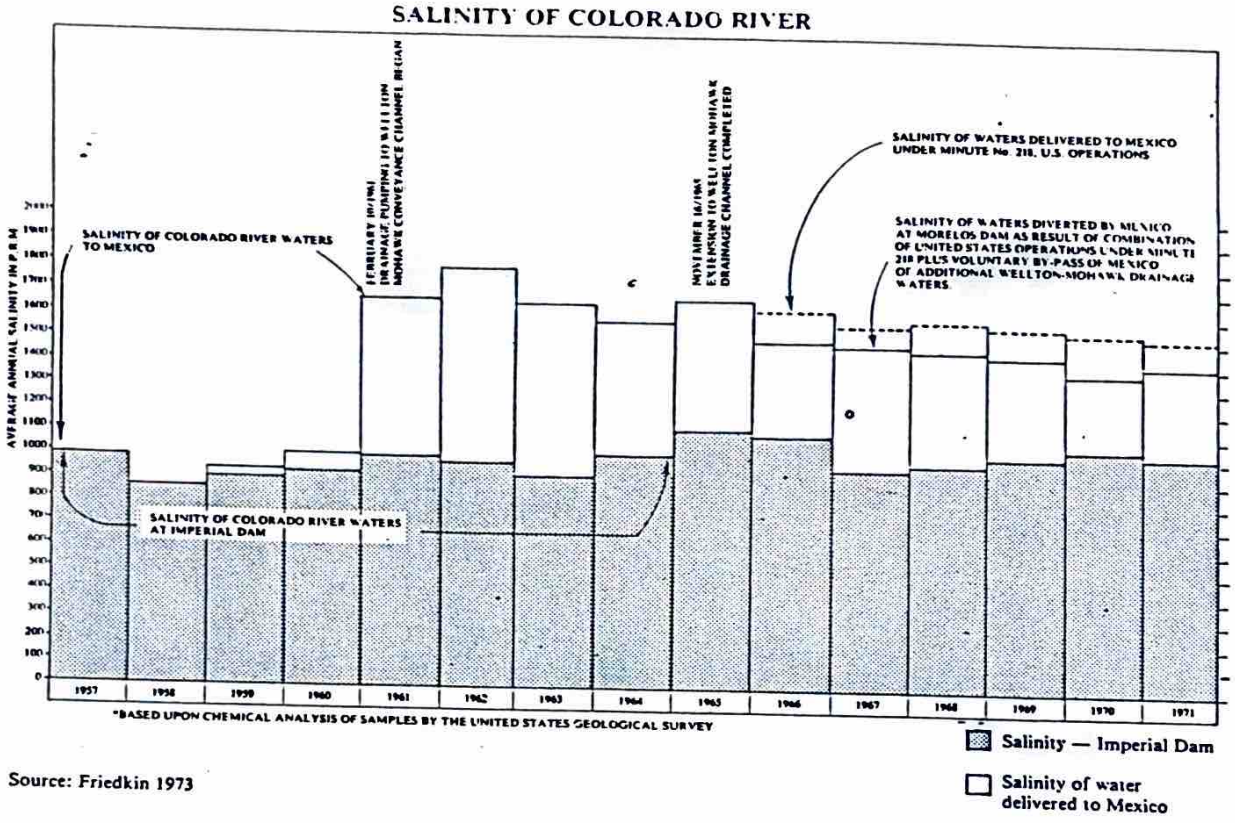
Globe and Mail, Bernard Bennell

In addition to this highly saline water being delivered to Mexico, the flow of excess water to Mexico, which is the amount beyond the treaty guarantee, was suddenly diminished because of a drought. The United States also closed Glen Canyon Dam in order to begin filling up Lake Powell. These factors combined increased the salt concentrations in Mexico from 800 ppm to a high level of 2,700 ppm (Furnish & Ladman, 1975:89).

Other events intensified the salinity crisis in the Mexicali Valley. In 1965 the United States changed their policy towards the cotton industry by which the price supports on the world market were removed. This cause the price of cotton to decrease sharply. In 1966, the Valley suffered the invasion of the pink bollworm, an insect that attacks the rounded seed pod of cotton. Thus, cotton production severely declined and the many enterprises associated with it, such as those selling farm-related supplies.

The termination of the bracero program in the United States also had severe effects. The bracero program was estalbished because of the great need for labor in the southwest. The United States and Mexican governments agreed to allow Mexicans to come to the United States for employment as seasonal farm laborers (Meier & Rivera, 1972:202-216). When these large numbers of Mexicans were forced to leave the United States, many chose to settle in the border areas which exacerbated the unemployment problems there.

The farmers of the Mexicali Valley began to protest against the highly saline water. These protests were manifested in



Source: Friedkin 1973

demonstration, news conferences, and parades which could be seen in the streets of Mexico City, thus undeniably viewed by Mexican and U.S. officials (Furnish & Ladman, 1975:89). The situation was clearly giving the United States a bad image in Mexico and adversely reflecting on its international image as a whole.

Mexico protested to the United States that it was violating the 1944 Treaty. Mexico claimed that the deterioration of the quality of the water released to Mexico was clearly damaging its property and that the essential part of the problem was not of a technical nature but rather of a moral and judicial nature" (Cabrera, 1975:30). Initially, the United States argued that the Wellton-Mohawk situation was the result of a technical irrigation problem within the United States and therfore of no concern to Mexico, and that in any case, the water was released to Mexico (Cabrera, 1975:27).

As early as 1945, the United States had maintained that a major portion of 1,500,000 acre-feet annual guarantee to Mexico would be composed of drainage water, but it had not considered the possibility of an increased level in salinity. Mexico had ceased all diversions from Morelos Dam and requested that the United States increase its deliveries in January and February 1962 in order to facilitate some dilution of this water. Thus, the United States made provisional arrangements to minimize the impact of the drainage returns. In addition, the Department of State commissioned a team of consulting engineers to study the Mexicali Valley and assess the actual damage. These reports, however, concluded that not much damage had in fact been caused

and insinuated that perhaps the problem was actually Mexico's lack of wise soil and water management practices (Le Marquand, 1977:32). It is more likely that these conclusions reflected an effort on the part of the United States to save face, than the reality of the situation in Mexico. The United States also feared that Mexico might have sufficient cause to bring legal action against the United States.

Meanwhile, Mexico was taking its initiative with policy measures. They decided to diversify agriculture so that crops with a higher degree of salt tolerance were favored. Mexico also installed more wells in the northeastern corner of the valley in an effort to decrease the reliance on drainage water (Furnish & Ladman, 1975:92-93).

President John F. Kennedy of the United States and President Adolfo López Mateos met in 1962 agreeing to have the International Boundary and Water Commission recommend corrective measures for the problem. Thus, the Committee of Fourteen was reactivated, with soil and water experts to work in conjunction with the International Boundary and Water Commission. As for the Committee of Fourteen, Senator Carl Hayden of Arizona, Chairman of the Senate Committee on Appropriations, and Senator Clinton Anderson of New Mexico, also Chairman of the Senate Committee on Interior and Insular Affairs were adamantly opposed to any solution which would require an increase to the 1,500,000 acre-feet treaty allotment to Mexico.

Thus, the first action to resolve the salinity problem was negotiated by the U.S. Section and Mexican section of the

International Boundary and Water Commission and entitled Minute 218. This was an international agreement other than the 1944 Treaty and did not need ratification by both central governments. Nevertheless, its implementation was dependent on the authorization of funds by the U.S. Congress. The International Boundary and Water Commission is responsible for these "Minutes" as they are for the 1944 Treaty, since these agreements are interpreting the Treaty. Such interpretations are provided under Article 24 of the Treaty.

By terms of Minute 218, the United States was required to build an extension of the Wellton-Mohawk drainage channel. This extension would terminate at Morelos Dam, where drainage waters could be dumped into the Colorado either above or below the dam. During October through February, the wells of Wellton-Mohawk could be pumped and their waters discharged before Morelos Dam where they would flow into the Gulf California. The wells with less saline water would be pumped the rest of the time. This water would be released above the dam to mix with other water in the river diverted by Mexico for the Mexicali Valley. The United States also agreed to release about 50,000 acre-feet of water annually from stored water above Imperial Dam to make up for the water which would be flowing into the Gulf instead of to the Mexicali Valley. These projects and other related works cost the United States about $11 million (Brownell & Eaton, 1975:257). The United States was able to overcome opposition to the Minute from the basin states by crediting the substitution water as return flow from Arizona. Thus, this water did not

represent in any way an increase in Mexico's entitlement. Minute 218 was to expire after five years but it was continued in force until 1972.

The results of Minute 218 as its measures were put forth into operation were favorable in terms of decreasing salinity to 1245 ppm. However, since the Mexicans decided that the maximum salinity they would tolerate for their irrigation purposes in the Mexicali Valley was 2130 ppm, Mexico chose to allow an additional 40,000 to 75,000 of the Wellton-Nohawk drainage to flow into the Gulf. They did this without any consultation with the United States. This measure further reduced salinity at Morelos Dam to 1160 ppm by 1971. Nevertheless, this was still considerably higher than the U.S. side of the border at the Imperial Dam. Thus, the protests from the Mexicali Valley farmers continued.

In 1972 Mexican President Luis Echeverria met with U.S. President Richard Nixon in order to find a more permanent solution. They agreed on immediate action to provide for the improvement in the quality of Colorado water delivered to Mexico. Thus, the Commissioners of the International Boundary and water Commission negotiated a new agreement to superseded Minute 218. Under the new Minute 241, the salinity at Morelos Dam was to be decreased by allowing a total of 118,000 acre-feet to flow to the Gulf with a substitution of better quality water of equal volume. By this substitution the salinity was reduced to 1140 ppm. Once again, Mexico unilaterally allowed the remaining portion of the drainage waters to flow to the Gulf. therefore, none of these

drainage waters would be included in Mexico's treaty allotment. The final salinity was reduced to 1,000 ppm.

In 1972 President Richard Nixon agreed to appoint a special representative to work on the salinity problem. Herbert Brownell, a former U.S. Attorney General, was selected. Brownell's task force as the first major all out effort to seek a solution. A significant number of representatives from different government agencies participated, such as the Department of Defense (Corps of Engineers, Environmental Protection Agency, Office of Management and Budget, and the continuously demanding Committee of Fourteen. Mr. Brownell himself went to Mexico to confer with President Echeverría. The main issue was the difference in quality between the water of users in the U.S. below Imperial Dam and the water delivered to Mexico at the nortern end of the border.

In 1973, Mexico began a program of extensive pumping of groundwater near the San Luis, Sonora area. This action opened up a whole new policy question. The issue of the lack of groundwater arrangements between the two countries was forced to the surface. Mexico's pumping from the underground reservoir could potentially deplete groundwater underlying both the United States and Mexico, the underground water is not being credited to Mexico's entitlement pursuant to the 1944 Treaty since groundwater was not distributed.

Groundwater resources are irregularly distributed to the Sonoran Desert region and the Arizona-Sonora border. Rainfall sinking into the ground after running some distance in a stream bed is the source of most of the groundwater. The history of

groundwater in this area confirms a haphazard usage. Surface is rapidly and intensely developed with little consideration of the hydrological interrelation between surface, underground, and atmospheric resources (Hundley, 1975:1-16). Irrigation agriculture and municipal-industrial uses have increased as the region has grown into a major population and agricultural center.

Groundwater pumping may lower the water table, as the action of pumping creates a cone-like depression in the water table with its lowest level at the pumping point. Water from nearby underground areas flows downward to the cone. This effect can partly be offset by a counteracting pumping system on the Arizona side of the border. If Arizona is capable of pumping at an accelerated rate, it could create an underground flow back to the north. If not, Arizona's pumping could at least stabilize the water table. However, the San Luis Valley receives most of its water from the Yuma Valley Division's return flow. This return flow enters Mexico through the San Luis Drain. It is then quite possible that if pumping systems are installed on both sides of the border, the drain may well dry up (Furnish & Ladman, 1975:103). However, it was a prevalent fear that dwelling on this issue at this time would interfere with the attainment of a salinity solution.

The Colorado basin states had been concerned for some time about the increasing salinity of the Colorado River in general. One of the economic objectives of the Nixon Administration was to decrease federal spending, therefore an expensive basin-wide salinity program was not likely to be considered. The Committee

of Fourteen emphasized in their meetings with Brownell that the Wellton-Mohawk Project was only one source of salt affecting the Colorado River. They argued that the imminent uses by the upper basin, especially with its potential use in this area for oil shale processing, in view of the increased need of energy resources, will increase salinity and therefore nullify a solution specifically related only to the Wellton-Mohawk Project. For this reason, they established the practicality of a basin-wide program in regard to the international problem at hand. Congressmen from the seven basin states considered it essential that one bill encompass both the appropriations to implement the new agreement with Mexico and a basin-wide salinity program (Holburt, 1975:25).

The basin states had strong allies in Congress, especially in the Water and Power subcommittees of the Committees on Interior and Insular Affairs in the Senate and House of Representatives. The Subcommittees served a major role in assessing proposed legislation and providing Congress with its recommendations. Congressmen from the basin states dominated both Water and Power Subcommittees. Even though the demand for a salinity program was only peripherally related to the international negotiation with Mexico, the ability of the regional interests to veto the President's agreement illustrates the critical role of such domestic groups. It can not be denied that a basin-wide salinity program would also benefit Mexico, so even those in Congress suspicious of the basin states' demands, were not able to effectively argue against this particular program.

In this manner, the "Permanent and Definitive Solution," as it was entitled, was finally achieved in the agreement of Minute 242 of the International Boundary and Water Commission. This was in 1973, almost twelve years since Mexico's initial protests.

The largest project was the construction of a desalting plant to upgrade the quality of the Wellton-Mohawk drainage water. Other principal projects included the construction of a canal to carry the Wellton-Mohawk drainage and brine to the Santa Clara Slough on the Gulf of California. The canal is to be used to carry off the brine produced by the desalting plant.

Another project entails the lining of a part of the Canal in order to save water lost by seepage. However, water saved by the lining can only be used as a temporary measure to meet the Treaty Agreement to Mexico. As California needs it for its own uses, other sources will eventually have to replace it. The United States also agreed to provide Mexico with rehabilitative assistance of the Mexicali Valley and assist then in the attainment of other sources of funds.

An outstanding element of this measure was the unprecedented high costs of the projects which were estimated to be $115,000,000. Approximately $99,575,000 of this amount was allocated for the desalting plant (Brownell & Eaton, 1975:267). It is difficult to say how this figure would compare if Mexico had gone the route of a tribunal of arbitration. I believe this evidence that the United States was willing to protect their international with as many dollars and as little was as it could give up!

Governments by exchange of Notes. It shall enter into force upon such approval; provided, however, that the provisions which are dependent for their implementation on the construction of works or on other measures which require expenditure of funds by the United States, shall become effective upon the notification by the United States to Mexico of the authorization by the United States Congress of said funds, which will be sought promptly.

Thereupon, the meeting adjourned.

J. F. FRIEDKIN
Commissioner of the United States

D HERRERA J
Commissioner of Mexico

F H SACKSTEDER JR
Secretary of the United States Section

FERNANDO RIVAS S
Secretary of the Mexican Section

de ambos Gobiernos por canje de notas. Entrará en vigor en la fecha de su aprobación; entendido, sin embargo, que las disposiciones cuyo cumplimiento depende de la construcción de obras o de otras medidas que requieran la erogación de fondos por parte de los Estados Unidos, entrarán en vigor al notificar los Estados Unidos a México la autorización del Congreso de los Estados Unidos para disponer de dichos fondos, la cual será procurada prontamente.

Con lo anterior se levantó la sesión.

D HERRERA J
Comisionado de México

J. F. FRIEDKIN
Comisionado de los Estados Unidos

FERNANDO RIVAS S
Secretario de la Sección de México

F H SACKSTEDER JR
Secretario de la Sección de los Estados Unidos

LIBRARY
UNIVERSITY OF CALIFORNIA
SANTA BARBARA
MAR 3 1974
GOVT. PUBLICATIONS DEPT.

STATE, DEPT. OF

COLORADO RIVER SALINITY

Agreement Between the
UNITED STATES OF AMERICA
and MEXICO

Confirming Minute No. 242 of the International Boundary and Water Commission, United States and Mexico

Effected by Exchange of Notes
Signed at México and Tlatelolco
August 30, 1973

NOTE BY THE DEPARTMENT OF STATE

Pursuant to Public Law 89–497, approved July 8, 1966 (80 Stat. 271; 1 U.S.C. 113)—

". . . the Treaties and Other International Acts Series issued under the authority of the Secretary of State shall be competent evidence . . . of the treaties, international agreements other than treaties, and proclamations by the President of such treaties and international agreements other than treaties, as the case may be, therein contained, in all the courts of law and equity and of maritime jurisdiction, and in all the tribunals and public offices of the United States, and of the several States, without any further proof or authentication thereof."

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscription Price: $27 per year; $6.75 additional for foreign mailing. Single copies vary in price. This issue 25 cents.

MEXICO

Colorado River Salinity

Agreement confirming minute no. 242 of the International Boundary and Water Commission, United States and Mexico.
Effected by exchange of notes
Signed at México and Tlatelolco August 30, 1973:
Entered into force August 30, 1973.

The American Ambassador to the Mexican Secretary of Foreign Relations

EMBASSY OF THE UNITED STATES OF AMERICA

No. 1234

MEXICO, D.F., *August 30, 1973*

EXCELLENCY:

I have the honor to refer to Minute No. 242 of the International Boundary and Water Commission signed August 30, 1973, entitled "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River". Point 10 of that Minute, consistent with the provisions of Article 24 (d) and Article 25 of the Treaty of February 3, 1944,[1] provides that it shall be expressly approved by both Governments.

Accordingly, if the Government of the United Mexican States is in agreement, I propose that the present note and Your Excellency's note in reply to the same effect, constitute an agreement between the Government of the United States of America and the Government of the United Mexican States confirming the provisions of Minute No. 242, which shall enter into force upon the date of these notes, subject, however, to the conditions of point 10 of said Minute.

Accept, Excellency, the assurances of my highest consideration.

ROBERT H. MCBRIDE

His Excellency
EMILIO O. RABASA,
Secretary of Foreign Relations,
Mexico, D.F.

---

[1] TS 994; 59 Stat. 1219.

The Mexican Secretary of Foreign Relations to the American Ambassador

ESTADOS UNIDOS MEXICANOS
SECRETARIA DE RELACIONES EXTERIORES
MEXICO

Núm. 11154 TLATELOLCO, D. F., *a 30 de agosto de 1973.*

SEÑOR EMBAJADOR:

Tengo el honor de referirme a la atenta nota de Vuestra Excelencia número 1234, fechada el día de hoy, cuyo texto vertido al español es el siguiente:

"Tengo el honor de hacer referencia al Acta número 242 de la Comisión Internacional de Límites y Aguas firmada el 30 de agosto de 1973, intitulada "Solución Permanente y Definitiva del Problema Internacional de la Salinidad del Río Colorado". El punto 10 de dicha Acta, de conformidad con lo estipulado en el Artículo 24 (d) y el Artículo 25 del Tratado del 3 de febrero de 1944, estipula que deberá ser expresamente aprobada por ambos Gobiernos.

Por lo tanto, si el Gobierno de los Estados Unidos Mexicanos está de acuerdo, propongo que la presente nota y la nota de respuesta de Vuestra Excelencia constituyan un Acuerdo entre el Gobierno de los Estados Unidos de América y el Gobierno de los Estados Unidos Mexicanos confirmando las estipulaciones del Acta 242, la cual entrará en vigor en la fecha de dichas notas, sujeto, sin embargo, a las condiciones del punto 10 del Acta mencionada".

En respuesta, tengo el honor de comunicar a Vuestra Excelencia que el Gobierno de los Estados Unidos Mexicanos está de acuerdo con los términos de la nota que transcribo y, en consecuencia, considera que dicha nota y la presente constituyen un acuerdo entre nuestros dos Gobiernos, el cual entra en vigor el día de hoy.

Aprovecho la oportunidad para renovar a Vuestra Excelencia el testimonio de mi más alta y distinguida consideración.

E. O. RABASA

Excelentísimo señor
ROBERT HENRY MCBRIDE
Embajador de los Estados Unidos de America,
Ciudad.

Translation

UNITED MEXICAN STATES
DEPARTMENT OF FOREIGN RELATIONS
MEXICO

No. 11154 TLATELOLCO, D.F., *August 30, 1973*

MR. AMBASSADOR:

I have the honor to refer to Your Excellency's note No. 1234, dated today, the text of which, translated into Spanish, reads as follows:

[For the English language text, see p. 1.]

In reply, I have the honor to inform Your Excellency that the Government of the United Mexican States concurs in the terms of the note transcribed above, and accordingly it considers that the aforesaid note and this reply thereto shall constitute an agreement between our two Governments which shall enter into force today.

I take this opportunity to renew to Your Excellency the assurance of my highest and most distinguished consideration.

E. O. RABASA

His Excellency
ROBERT HENRY MCBRIDE,
Ambassador of the United States
of America,
Mexico, D.F.

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO

Mexico, D.F.,
August 30, 1973.

Minute No. 242

PERMANENT AND DEFINITIVE SOLUTION TO THE INTERNATIONAL PROBLEM OF THE SALINITY OF THE COLORADO RIVER.

The Commission met at the Secretariat of Foreign Relations, at Mexico, D.F., at 5:00 p.m. on August 30, 1973, pursuant to the instructions received by the two Commissioners from their respective Governments, in order to incorporate in a Minute of the Commission the joint recommendations which were made to their respective Presidents by the Special Representative of President Richard Nixon, Ambassador Herbert Brownell, and the Secretary of Foreign Relations of Mexico, Lic. Emilio O. Rabasa, and which have been approved by the Presidents, for a permanent and definitive solution of the international problem of the salinity of the Colorado River, resulting from the negotiations which they, and their technical and juridical advisers, held in June, July and August of 1973, in compliance with the references to this matter contained in the Joint Communique of Presidents Richard Nixon and Luis Echeverría of June 17, 1972. [1]

COMISION INTERNACIONAL DE LIMITES Y AGUAS ENTRE MEXICO Y ESTADOS UNIDOS

México, D.F.,
30 de agosto de 1973.

Acta Num. 242

SOLUCION PERMANENTE Y DEFINITIVA DEL PROBLEMA INTERNACIONAL DE LA SALINIDAD DEL RIO COLORADO.

La Comisión se reunió en la Secretaría de Relaciones Exteriores, en México, D.F., a las 17:00 horas del 30 de agosto de 1973, en cumplimiento de las instrucciones que recibieron los dos Comisionados de sus respectivos Gobiernos, a fin de incorporar en una Acta de la Comisión las recomendaciones conjuntas que hicieron a sus respectivos Presidentes el Secretario de Relaciones Exteriores de México, Lic. Emilio O. Rabasa, y el Representante Especial del Presidente Richard Nixon, Embajador Herbert Brownell, y que fueron aprobadas por los Presidentes, para una solución permanente y definitiva del problema internacional de la salinidad del Río Colorado, como resultado de las negociaciones que, con sus asesores técnicos y jurídicos, tuvieron en junio, julio y agosto de 1973, en cumplimiento de lo que sobre esta materia expresaron los Presidentes Luis Echeverría y Richard Nixon en su Comunicado Conjunto del 17 de junio de 1972.

[1] *Department of State Bulletin*, July 10, 1972, p. 66.

Accordingly, the Commission submits for the approval of the two Governments the following

RESOLUTION:

1. Referring to the annual volume of Colorado River waters guaranteed to Mexico under the Treaty of 1944, of 1,500,000 acre-feet (1,850,234,000 cubic meters):

a) The United States shall adopt measures to assure that not earlier than January 1, 1974, and no later than July 1, 1974, the approximately 1,360,000 acre-feet (1,677,545,000 cubic meters) delivered to Mexico upstream of Morelos Dam, have an annual average salinity of no more than 115 p.p.m. ± 30 p.p.m. U.S. count (121 p.p.m. ± 30 p.p.m. Mexican count) over the annual average salinity of Colorado River waters which arrive at Imperial Dam, with the understanding that any waters that may be delivered to Mexico under the Treaty of 1944 by means of the All American Canal shall be considered as having been delivered upstream of Morelos Dam for the purpose of computing this salinity.

b) The United States will continue to deliver to Mexico on the land boundary at San Luis and in the limitrophe section of the Colorado River downstream from Morelos Dam approxi-

Consecuentemente, la Comisión somete a la aprobación de los dos Gobiernos la siguiente

RESOLUCION:

1. Con referencia al volumen anual de las aguas del Río Colorado garantizados a México por al Tratado de 1944, de 1,850,234,000 metros cúbicos (1,500,000 acres-pies):

a) Los Estados Unidos adoptarán medidas para dar seguridades de que no antes del 1° de enero de 1974, y no despúes del 1° de julio de 1974, los 1,677,545,000 metros cúbicos (1,360,000 acres-pies), aproximadamente, que se entregan a México aguas arriba de la Presa Morelos, tengan una salinidad media anual que no sobrepase en más de 121 p.p.m. ± 30 p.p.m., normas de México, (115 p.p.m. ± 30 p.p.m., normas de los Estados Unidos), a la salinidad media anual de las aguas del Río Colorado que lleguen a la Presa Imperial, entendido que las aguas que se entreguen a México por conducto del Canal Todo Americano de conformidad con el Tratado de 1944, se considerarán como si se hubieran entregado aguas arriba de la Presa Morelos para el propósito de calcular esta salinidad.

b) Los Estados Unidos continuarán entregando a México en la línea divisoria terrestre en San Luis y en el tramo limítrofe del Río Colorado, aguas abajo de la Presa Morelos, aproxima-

mately 140,000 acre-feet (172,689,000 cubic meters) annually with a salinity substantially the same as that of the waters customarily delivered there.

c) Any decrease in deliveries under point 1(b) will be made up by an equal increase in deliveries under point 1(a).

d) Any other substantial changes in the aforementioned volumes of water at the stated locations must be agreed to by the Commission.

e) Implementation of the measures referred to in point 1(a) above is subject to the requirement in point 10 of the authorization of the necessary works.

2. The life of Minute No. 241[1] shall be terminated upon approval of the present Minute. From September 1, 1973, until the provisions of point 1(a) become effective, the United States shall discharge to the Colorado River downstream from Morelos Dam volumes of drainage waters from the Wellton-Mohawk District at the annual rate of 118,000 acre-feet (145,551,000 cubic meters) and substitute therefor an equal volume of other waters to be discharged to the Colorado River above Morelos Dam; and, pursuant to the decision of President Echeverría expressed in the

damente 172,789,000 metros cúbicos (140,000 acres-pies) anuales, con una salinidad substancialmente igual a la de las aguas habitualmente entregadas ahí.

c) Cualquiera disminución en las entregas a que se refiere el apartado b) de este punto 1 será compensada por un aumento igual en las entregas a que se refiere el apartado a) de este punto 1.

d) Cualesquiera otros cambios substanciales en los volúmenes de agua antedichos en los lugares indicados deberán ser convenidos por la Comisión.

e) La ejecución de las medidas a que se refiere arriba el apartado a), está sujeta a los requisitos de la autorización de las obras necesarias a que se refiere el punto 10.

2. La vigencia del Acta 241 se dará por concluida con la aprobación de la presente Acta. Desde el 1° de septiembre de 1973 hasta que se pongan en vigor las disposiciones del apartado a) del punto 1, los Estados Unidos descargarán al Río Colorado, aguas abajo de la Presa Morelos, volúmenes de las aguas de drenaje del Distrito de Wellton-Mohawk a razon de 145,551,000 metros cúbicos (118,000 acres-pies) anuales y los sustituirán con volúmenes iguales de otras aguas que serán descargados al Río Colorado aguas arriba de la Presa Morelos; y, de conformidad con la decisión

[1] TIAS 7404, 7696; 23 UST 1256; 24 UST.

Joint Communique of June 17, 1972, the United States shall discharge to the Colorado River downstream from Morelos Dam the drainage waters of the Wellton-Mohawk District that do not form a part of the volumes of drainage waters referred to above, with the understanding that this remaining volume will not be replaced by substitution waters. The Commission shall continue to account for the drainage waters discharged below Morelos Dam as part of those described in the provisions of Article 10 of the Water Treaty of February 3, 1944.

3. As a part of the measures referred to in point 1(a), the United States shall extend in its territory the concrete-lined Wellton-Mohawk bypass drain from Morelos Dam to the Arizona-Sonora international boundary, and operate and maintain the portions of the Wellton-Mohawk bypass drain located in the United States.

4. To complete the drain referred to in point 3, Mexico, through the Commission and at the expense of the United States, shall construct, operate and maintain an extension of the concrete-lined bypass drain from the Arizona-Sonora international boundary to the Santa Clara Slough of a capacity of 353 cubic feet (10 cubic

del Presidente Echeverría, expresada en el Comunicado Conjunto del 17 de junio de 1972, los Estados Unidos descargarán al Río Colorado, aguas abajo de la Presa Morelos, las aguas de drenaje del Distrito de Wellton-Mohawk que no forman parte de los volúmenes de agua de drenaje arriba citados, entendido que ese volumen restante no será reemplazado por otras aguas de sustitución. La Comisión continuará contabilizando las aguas de drenaje que se descarguen aguas abajo de la Presa Morelos como parte de las que se describen en las estipulaciones del Artículo 10 del Tratado de Aguas del 3 de febrero de 1944.

3. Como parte de las medidas a que se refiere el apartado a) del punto 1, los Estados Unidos prolongarán en su territorio el dren de desvío de Wellton-Mohawk, revestido de concreto, desde la Presa Morelos hasta la línea divisoria internacional entre Sonora y Arizona, y operarán y mantendrán las partes del dren de desvío de Wellton-Mohawk ubicadas en los Estados Unidos.

4. Para completar el dren a que se refiere el punto 3, México, por conducto de la Comisión, y a expensas de los Estados Unidos, construirá, operará y mantendrá una prolongación del dren de desvío, revestido de concreto, desde el límite internacional entre Sonora y Arizona hasta el Estero de Santa Clara, con

meters) per second. Mexico shall permit the United States to discharge through this drain to the Santa Clara Slough all or a portion of the Wellton-Mohawk drainage waters, the volumes of brine from such desalting operations in the United States as are carried out to implement the Resolution of this Minute, and any other volumes of brine which Mexico may agree to accept. It is understood that no radioactive material or nuclear wastes shall be discharged through this drain, and that the United States shall acquire no right to navigation, servitude or easement by reason of the existence of the drain, nor other legal rights, except as expressly provided in this point.

5. Pending the conclusion by the Governments of the United States and Mexico of a comprehensive agreement on groundwater in the border areas, each country shall limit pumping of groundwaters in its territory within five miles (eight kilometers) of the Arizona-Sonora boundary near San Luis to 160,000 acre-feet (197,358,000 cubic meters) annually.

6. 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

una capacidad de 10 metros cúbicos (353 pies cúbicos) por segundo. México permitirá a los Estados Unidos descargar por este dren al Estero de Santa Clara todas o una parte de las aguas de drenaje de Wellton-Mohawk, los volúmenes de salmuera resultantes de las operaciones de desalación que se hagan en los Estados Unidos para cumplir con la Resolución de esta Acta, y cualesquiera otros volúmenes de salmuera que México convenga en aceptar. Queda entendido que no se descargarán por este dren materiales radioactivos ni desperdicios nucleares, y que los Estados Unidos no adquirirán derechos de navegación, ni a servidumbres de cualquiera índole a causa de la existencia del dren, ni otros derechos legales, excepto los que expresamente se citan en este punto.

5. Mientras se llega a la celebración por los Gobiernos de México y los Estados Unidos de un convenio de alcance general sobre aguas subterráneas en las áreas fronterizas, cada país limitará el bombeo de las aguas subterráneas en su propio territorio, dentro de los 8 kilómetros (5 millas) de la línea divisoria entre Sonora y Arizona y cerca de San Luis, a 197,358,000 metros cúbicos (160,000 acres-pies) anuales.

6. A fin de evitar problemas futuros, México y los Estados Unidos se consultarán recíprocamente antes de emprender, en el área fronteriza de sus respectivos territorios,

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.

7. The United States will support efforts by Mexico to obtain appropriate financing on favorable terms for the improvement and rehabilitation of the Mexicali Valley. The United States will also provide nonreimbursable assistance on a basis mutually acceptable to both countries exclusively for those aspects of the Mexican rehabilitation program of the Mexicali Valley relating to the salinity problem, including tile drainage. In order to comply with the abovementioned purposes, both countries will undertake negotiations as soon as possible.

8. The United States and Mexico shall recognize the undertakings and understandings contained in this Resolution as constituting the permanent and definitive solution of the salinity problem referred to in the Joint Communique of President Richard Nixon and President Luis Echeverría dated June 17, 1972.

9. The measures required to implement this Resolution shall be undertaken and completed at the earliest practical date.

10. This Minute is subject to the express approval of both

cualquier nuevo desarrollo de aguas superficiales o de aguas subterráneas, o de emprender modificaciones substanciales de sus desarrollos actuales, que pudieran afectar adversamente al otro país.

7. Los Estados Unidos apoyarán las gestiones de México para obtener financiamiento apropiado y en términos favorables para el mejoramiento y rehabilitación del Valle de Mexicali. Los Estados Unidos también proporcionarán asistencia no reembolsable, sobre una base mutuamente aceptable a ambos países, exclusivamente para aquellos aspectos del programa mexicano de rehabilitación del Valle de Mexicali relacionados con el problema de la salinidad, incluyendo drenaje tubular. A fin de cumplir con los propositos arriba mencionados, ambos países emprenderán negociaciones tan pronto como sea posible.

8. México y los Estados Unidos reconocerán que las medidas y entendimientos contenidos en esta Resolución constituyen la solución permanente y definitiva del problema de la salinidad a que se refiere el Comunicado Conjunto del Presidente Luis Echeverría y del Presidente Richard Nixon, fechado el 17 de junio de 1972.

9. Las medidas requeridas para poner en práctica esta Resolución serán emprendidas y terminadas en la fecha más próxima factible.

10. La presente Acta requiere la aprobación específica

As for the groundwater issue, guidelines for a future solution to this issue were set out in two provisions whereby each side of the border would be limited to 160,000 acre-feet within five miles of the international boundary pending the conclusion of a comprehensive groundwater agreement, and the requirement that the United States and Mexico consult each other before undertaking any developments of either surface or groundwater which might create unfavorable effects to the other country (U.S. Dept. of State, 1973:8,9).

Although Minute 242 is entitled the "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River," many issues remain to be resolved. Some of these issues include the ultimate question of what constitutes the absolute level of salinity acceptable and proper for the Mexicali Valley, the exact amount of reparation for the Mexicali Valley, the potential effects of salt flowing to the Gulf of California, and determining whether or not salinity can be considered a pollutant. This last issue would be based on the conclusion that salinity is entirely a natural process or subordinate to water and soil management activities.

A major issue that deserves immediate attention is groundwater allocation. In view of its significance in the hydrological cycle in these times of water scarcity, a critical examination of groundwater policy in each country can aid in formulating groundwater policy for the border region.

Bibliography

Brownell, Herbert and Samuel D. Eaton. "The Colorado River Salinity Problem with Mexico." American Journal of International Law, 69, No. 2 (1975), pp. 255-271.

Cabrera, Luis. "Use of the Waters of the Colorado River in Mexico. Pertinent Technical Commentaries." Natural Resources Journal, 15, No. 1 (1975), pp. 27-34.

Furnish, Dale Beck and Jerry R. Ladman. "The Colorado River Salinity Agreement of 1973 and the Mexicali Valley." Natural Resources Journal, 15, No. 1 (1975), pp. 83-107.

Holburt, Myron B. "International Problems of the Colorado River." National Resources Journal, 15, No. 1 (1975), pp. 11-26.

Hundley, Norris. Water and the West. Los Angeles: University of California Press, 1975.

LeMarquand, David G. International Rivers. Canada: Westwater Research Centre, 1977.

Meier, Matt S., and Feliciano Rivera. The Chicanos. New York: Hill and Wang, 1972.

U.S. Department of State. Colorado River Salinity; Confirming Minute No. 242 of the International Boundary and Water Commission, United States and Mexico. Washington, D.C.: Government Printing Office, 1973.

Vela, Salgado, E. Hernández. "Principal Economic Aspects of the Problem of Salinity of the Colorado River." Natural Resources Journal, 15, No. 1 (1975), pp. 129-133.

VI. GROUNDWATER POLICY IN THE UNITED STATES AND MEXICO

I will discuss the national groundwater policy in the United States and Mexico. This information is helpful in understanding the policymaking context specifically in the U.S.-Mexico border region.

Minute 242 of the International Boundary and Water Commission limited groundwater pumping within the Arizona-Sonora borderland area "pending the conclusion of the governments of Untied Sates," and "with the objective of avoiding future problems, the United States and Mexico shall consult with each other prior to undertaking any new developments of either the surface or water resources,..." (U.S. Dept. of State, 1973:8,9). Thus, the process of policymaking was formally initiated from this isolated incident on the Arizona-Sonora border. It is imperative to take the steps to assure that groundwater pumping does not follow in the same manner of exploitation as the surface water. The first step toward the development of a logical groundwater resource management and planning approach is the procurement of information on that resource.

At the time of the treaty there was little understanding of the behavior of underground water among the negotiators (U.S. Cong. Senate, 1945: 1281-1219). There is no evidence that geologists or geographers were consulted regarding this specific matter. Knowledge of the intrinsic characteristics particular to groundwater, and how groundwater and surface water as integral parts of the hydrological cycle is crucial information for policymaking.

There are two major classifications of groundwater: (1) those that serve as tributaries to surface water flows and; (2) those that are not connected hydrologically with a stream or lake. The latter is thus interconnected within the underground system. All water which is pumped from underground is either being replaced or it is not. If withdrawals exceed rates of discharge, the groundwater is said to be of a "mining yield." The "perennial yield" of underground water occurs when the rate of pumping allows for a continuous use. Thus, such pumping provides a sustained yield which can be defined as water capable of being withdrawn annually without incurring undesirable results. Undesirable results include progressive reduction of water resource, development of uneconomic pumping conditions, deterioration of groundwater quality and land subsidence caused by lowered groundwater levels.

It is also necessary to distinguish between flow and stock resources. Flow resources are self-replenishing, and include those groundwaters being recharged continuously as part of the hydrological cycle of precipitation and evaporation. Policy regarding this particular resource should emphasize the best use of this continuously available supply, but not necessarily at a constant rate of usage (Utton, 1978:657).

Stock resources include those aquifers with a low rate of replenishment, but with large amounts of water in underground storage. Thus, it is no longer regarded as self-replenishing, and classified as an exhaustible resource, similar, for example, to the non-renewable resource of petroleum. Hence, continuous

extraction will eventuate its complete exhaustion. Hence continuous extraction will eventuate its complete exhaustion. Policymaking regarding this type of groundwater reflects decisions on whether and when to make use of it.

A number of considerations are involved in the orderly development of groundwater supplies. However, as the world is not neat and orderly, a situation may arise whereby it is advisable to "mine" a basin with inadequate replenishment to meet water needs. Such a decision should be reached based upon the knowledge of the various potential consequences - social, economic, political, and legal implications, to name just a few.

The states of Arizona, California, New Mexico, and Texas which border Mexico are the heaviest users of groundwater in the United States. At the same time, groundwater within the U.S.-Mexico border area has been determined to be scarce, although it is not known exactly how much groundwater is located in this area (Clark, 1978:153,155). A report in 1973 of the National Water Commission recognized some of the problems confronting the makers of groundwater law, management, and administration. The main problem includes the integration management of surface and groundwater quality.

Other considerations included aquifer protection, subsidence, and the collection of data on groundwater accompanied by a complete and meaningful interpretation of such data. Thus far, the law has not adequately responded to the increased technical knowledge of groundwater in one area to the groundwater located in another area. Therefore, the right of a landowner to

pump groundwater frequently conflicts with rights of surface water appropriatons downstream (Clark, 1976:472).

The Colorado basin states of Arizona, California, and New Mexico which border Mexico each have different groundwater law. Not only does it vary from state to state, but differs from their laws pertaining to surface waters. Although the State of Arizona has the most systematized water code which was recently revised in 1980, none of these states has a system which regulates such supplies within the state and along the border areas. Traditionally, the role of the federal government in groundwater legislation has been limited (Smith, 1945:145). The implications of groundwater as an exploitive resource in view of the impending exhaustion of surface and water supplies, will increase the likelihood of the expansion of federal intervention. In 1982 a U.S. Supreme Court decision, Sporhase v. Nebraska, placed groundwater located on non-federal lands subject to federal control. Groundwater was newly defined as an article of commerce and thereby subject to federal regulation under the commerce clause (Smith, 1985:149).

The management of Arizona groundwater demonstrates the interest of the federal government in the issue of groundwater and its capacity to force the states to conduct groundwater management which reflect federal policies. This state exemplifies the greatest overuse of groundwater. Since the 1940's, the U.S. Department of Interior has pressured policymakers of Arizona to enact a comprehensive groundwater management program which would mitigate the potentiality of overdrafting. Its

threats took the form of impeding their much desired Central Arizona Project through the withholding of funds and water. This Project was designed to transport Colordao River water to Phoenix and Tucson. Such pressure continued until the Carter administration in 1980. Interviews conducted with people active in the passage of the 1980 Arizona Groundwater Management Act conclude that such an intensive management code was only achieved because of the federal pressure involved (Smith, 1985:150).

In 1983, there were forty-four programs with either groundwater quality or quantity as their primary responsibility. Agencies ranged from the Army Crops of Engineers to the Fish and Wildlife Service. But these programs, for the most part, have not yet compiled data regarding groundwater specifically in the border region. The Environmental Protection Agency (EPA) created an office of Groundwater Protection in order to increase the effectiveness of groundwater pollution control programs. Part of the EPA program for 1984 gave the states primary responsibility to protect groundwater. This decentralized nature of the United States water management has tended to create an ad hoc pattern of groundwater development. However, it is clear that as the federal government grapples with expanding uses of water in areas of energy development, seeking solutions to problems in the agricultural sector of the economy, and its international competition with Mexico, its presence as the dominant groundwater policymakers is certain to increase. The jurisdiction over such matters has slowly evolved, while Mexico's

national government has largely maintained a high level of regulation of its natural resources.

In Mexican water policy, surface water is more regulated than groundwater. Although groundwater is basically left for private appropriation, the Ministry of Agriculture and Water Resources (Secretaria de Agricultura y Recursos Hidraulicos, SARH) can exercise full power in prohibiting pumping in particular zones if effects prove undesirable to the aquifer, existing developments, or unfavorable to public interests. The Ministry is one of the prestigious and powerful organizations of the government. Its budget for 1975 amounted to 662.4 million U.S. dollars, and its employees numbered 59,500. However, water resource programs in developing nations suffer from a lack of skilled employees. Of these 59,500 employees, only 32% can be classified as either technicians, professionals or administrators. Concurrent with this program, is the high turnover rate of those in professional positions. Approximately 45% to 60% hold their position for less than three years (Schramm, 1976:928). Generally in all high level positions and in many medium level positions, a turnover occurs every six years. This consideration is important in respect to establishing a continuity of policy.

The lack of skilled employees is reflective of the higher education system in the developing country. Presently, the output of the higher education system is not able to fill these needs as well as to provide for the other sectors of the growing economy. Thus, many water resource programs have suffered both at the national and local levels because of this deficiency.

Nevertheless, in Mexico, regulation of groundwater and its integration into a systematic water policy is well advanced. In 1971, national water planning was initiated and culminated in an official National Water Plan in 1975. However, since 1964 a subministry of groundwater has existed. Presently, it is actively undertaking an extensive program highlighting groundwater development and conservation as a fundamental in its contribution to the national plan (Cummings, 1972:45-46).

The structure of SARH insures that policy formation directly reflects the political objectives of the regime, while allowing the agency to handle the agreed upon technical aspects of the policies. It functions as the basic instrument for the articulation of water resources needs, and its influence is perhaps greater than any U.S. federal water-related agency. In ideological as well as practical terms, the legitimacy of the government is heavily gauged on its ability to develop the agriculture sector within the larger development scheme of the country. Mexico, as a developing country, has traditionally placed high priority on both domestic and international water policy as the key to the future. That groundwater will play prominent role in such development is already evident in the San Luis region.

In their respective approaches to the achievement of national water policy objectives, the United States and Mexico are predisposed to espouse differing perspectives on water resource issues. These perspectives combined with the larger, historical context of bilateral relations will shape United States-Mexico groundwater negotiations.

Bibliography

Clark, Robert E. "Institutional Alternatives for Managing Groundwater Resources: Notes for a Proposal." Natural Resources Journal, 18, No. 1 (1978), pp. 633-664.

Clark, Robert E. "Role of Legislation in Groundwater Management." Creighton Law Review, 2, No. 10 (1976), pp. 469-487.

Cummings, Robert. Water Resources Management in Northern Mexico. Baltimore: Resources for the Future John Hopkins University, 1972.

Hayton, Robert. "Institutional Alternatives for Mexico-U.S. Groundwater Management." Natural Resources Journal, 18, No. 1 (1978), pp. 201-212.

Jamail, Milton H., and Stephen P. Mumme. "Disputing the Hidden Waters; Dimensions of Groundwater Conflict Along the U.S./Mexico Border." New Scholar, 9, No. 1,2 (1984), pp. 215-230.

Mumme, Stephen P. "U.S.-Mexican Groundwater Problems." Journal of Interamerican Studies and World Affairs, 22, No. 1 (1980) pp. 31-55.

Schramm, Gunter. "Human-Institutional Factors." Natural Resources Journal, 16, No. 4 (1976), pp. 923-937.

Smith, Zachary. "Federal Intervention in the Management of Groundwater Resources: past Efforts and Future Prospects." Publius: The Journal of Federalism, 15, No. 1 (1985), pp. 145-159.

U.S. Department of State. Colorado River Salinity; Conifrming Minute No. 242 of the International Boundary and Water Commission, United States and Mexico. Washington, D.C.: Government Printing Office, 1973.

VII. THE FUTURE OF WATER POLICY IN THE U.S.-MEXICO BORDER REGION

The Colorado River is an international water resource regardless of which nation develops of which nation develops it first or in which nation it originates. The role of water as a critical determinant in the promotion of general socio-economic advancement is striking in the U.S.-Mexico border region with its continuously increasing population projected to double by the year 1000 (Utton, 1982:1108). On the basis of this projection and the lack of guidelines for transnational usage of groundwater "a situation exists which encourages each nation to outdo its neighbors by developing its groundwater resources as quickly as possible, perhaps even to a joint depletion of the groundwater resource." (Teclaff & Utton, 1981:162-163).

For this reason, effective water resource policy should reflect the integration of all water resources of this particular geographic region. Specifically, this entails the consideration of surface and groundwater which flow in, stand on, are present within, and pass over this territory. Thus, the concept of the Colorado River as an international drainage basin should be expanded to an international water resource system which recognizes the entire hydrological system (Bradley & DeCook, 1978:31).

However, the ability to formulate and implement policy effectively requires the appropriate institutional framework. Such an institution must extend its scope beyond the sole consideration of the technical and engineering aspects of

hydrological resources to the consideration of the economical, sociological, and political elements of the region. Such an institution must facilitate the reconciliation of the different interests involved so that feasible decisions can be reached. Finally, it must foster a faithful implementation of policies and a continuous evaluation of such policies.

Today the International Boundary and Water Commission, with its experience since the establishment by the 1944 Treaty, is the most logical agency to undertake such a task. As pursuant to the Treaty, its major responsibility is "to settle all differences that may arise between the two governments with respect to the interpretation and application of the treaty" (Art. 24(d)). The Commission and its personnel are allowed to move freely in the border region of both countries for the purpose of observational studies. Although the sections of the Commission negotiate an agreement in the form of "Minute" such agreements are subject to the approval of both central governments especially in respect to the appropriation of funds to fulfill the project agreed upon. Therefore the Commission has no final authority in its own right.

Within this context, the U.S. section operates under the Department of State where the proposed policies are examined for approval before the Commissioner proceeds with the formal action of a "Minute." The capacity of the Commission is as such that it does have a considerable amount of freedom in the areas specified in the Treaty, but it is quite limited in areas not specified. However, the regional nature of the Commission's

jurisdiction allows the Section considerable functional independence from the Department of State (Mumme, 1984:118).

As it oversees the whole length of the border, the Commission has nearly a dozen offices established between San Diego, California and Brownville, Texas (Mumme, 1984:120). Administratively, it is more independent than its Mexican counterpart, Comisión Internacional de Límites y Aguas (CILA). Depending upon the type of projects that are being pursued at a given time, there are about 3425 people employed in the U.S. Section. In contrast, the CILA operates with fewer than 100. However, this is due in part to the greater administrative responsibility that the U.S. section possesses which requires more personnel to carry it out.

The relationship of the U.S. Section to the CILA and the border states further defines its unique role in its regional nature. Depending on its varying activity, it has generated employment and business for the border population. This has occurred on both sides of the border. Thus, in its service to the border area, the Commission has cultivated a viable domestic constituency. Therefore, the U.S. Section has to reconcile the interests of the Department of State and the border states.

The position of Commissioner is one that is held for a long period, and usually until the person decides to retire. This long period allows for the accumulation of experience which contributes to the strength of the Commission in providing a framework of continuity of policy formulation. However, suppose the Commissioner proves to be uncompromising or acts in an

overwhelmingly political fashion which violates the 1944 Treaty that limits the Commissioner to a technical status. There is nothing in the Treaty which serves to resolve such potential problems. Nevertheless, having an extensive knowledge of the border area and the history of negotiations play a major role in the Commission's effectiveness.

Since the 1944 Treaty, the Commission has had to deal with many controversial issues, and its shortcomings, due to changing social, economic and political priorities, are being exposed. Its functions have expanded somewhat, for example, Minute No. 261 of 1979 deals with border sanitation problems which focuses on the concern of the health and well-being of the border populations. But in many aspects it has ceased to accommodate the passage of time and the increasing complexity of issues. Thus, presently we are faced with non-management rather than mismanagement of groundwater (Clark, 1976:475). This issue marks a distinctive evolution in bilateral relations as it points to the complexity of transboundary ecology (Mumme, 1980:31).

There is also a dire lack of data on border groundwater. Data collection for this resource is time consuming and costly. Once one knows what type of groundwater exists and where it is located, understanding the entire interactive situation of water and its connection to the region's agriculture, industry, urban growth and the natural ecosystem is necessary.

Presently, the International Boundary and Water Commission's informational system operates on two levels of data collection. Such data collection reflects the responsibility of each section

to its own office concurrent to the Commission. However, just as the water resource system should be viewed as a whole, so should the institution reflect this wholeness. Thus, the designation of one central place of information regarding all water-related activity should be established.

One way to determine if the quality or quantity of the information is adequate is to examine it in terms of its ability to identify the consequences of alternative courses of action subordinate to the different values espoused by the various interests. This particular quality of information combined with feedback from past experiences provides a strong foundation upon which to formulate policy. Needless to say, sufficient resources must be available to handle such an intense data collection. However, most of the intransigent problems arise as it becomes necessary to move from the process of data collection to the planning and development stages.

Once the information is gathered, the manner by which it is put to use or even perhaps ignored is largely subordinate to other factors, but mainly political ones. As illustrated in the negotiations of the 1944 Treaty and Minute 242 - the occurrence of a disaster has been the catalyst for concerted action. This phenomenon is not unusual as it is a common tendency for institutions to maintain their attention on previously encountered problems than to plan for the future (Sewell, 1976:795). Thus, an intense water shortage or severe deterioration of water quality must occur before any changes occur. For the Commission, this has resulted in ad hoc solutions. Such policies do not

represent the more desirable ongoing planning process that operates to facilitate a long-range scheme of management.

The Commission does not possess any means by which to enforce implementation of policy. The projects proposed in the "Minutes" do not become actual solutions until the execution of the proposed projects. On the U.S. side the role of Congress is decisive in the ultimate realization of the "Minutes."

A direct means of enforcement including the use of penalties would not be feasible since it may intensify the present tensions representing each nation's fear of encroachment on their sovereignty. However, some type of supervisory power assigned to the Commission would help to enforce its agreements as it carries out its duties under the 1944 Treaty.

It is clear that an evaluation of the Commission, whereby opportunities for improvement can be identified, is long overdue. This would allow for the modification of policies and procedures to ensure that increased knowledge and understanding of the issues can be successfully incorporated in the decision-making process. It is time for both governments to agree to enlarge the Commission's existing responsibilities derived from the 1944 Treaty. This would accommodate a broader and more comprehensive water resource program at the border. However, it must be emphasized that his broader orientation, does not in any way represent an encroachment of the authority of either country in this border region.

Thus, I believe a reasonable solution would be to build upon the existing Commission to allow for this complex context of

policymaking while maintaining the strengths it has demonstrated in the past. It is necessary to reassess the area unit which is defined in the 1944 as the "limitrophe"* (Article 24(f)). Redefining the border region by disregarding the political boundary and viewing it as a regional unit could result in more realistic negotiations.

I believe that the possibility of achieving a treaty similar to the 1944 Treaty but which focuses on groundwater allocation is highly unlikely. Groundwater allocation would have to consider surface water distributions which might bring parts of he 1944 Treaty into question. Yet a comprehensive treaty incorporating the entire resource system, superseding the 1944 Treaty, would be even more unlikely.

A tribunal of arbitration has always existed as an alternative. Mexico was especially eager to voice its willingness to resort to this alternative in the negotiations for the 1944 Treaty, although it is difficult to determine exactly what the results might have been. In general, international law which would be used as the basis for a ruling tends to be more primitive than national law (Alheritiere, 1976:915). This could result in devastating effects in respect to the groundwater issue. Moreover, the United States and the International Court of Justice have concluded that cooperation rather than a judicial is the most effective route to resolve international water problems. This is especially true since the United States has

---

*Of or pertaining to areas contiguous to an international frontier.

demonstrated in other situations that it can successfully ignore such rulings. Thus, it can be concluded that a judicial ruling could intensify friction between the United States and Mexico. Moreover, courts resolve problems on a case by case basis and are not equipped for any long term planning and management approaches.

As can be seen in the Minute 242 agreement, solutions to water problems feature decisions which are primarily based on political feasibility rather than on economic criteria. For example, the desalting plant proposed in this Minute was originally estimated by Congress to cost $99,575,000 is now estimated to be $225 million (Keating, 1985:4). Hence, it can be concluded that the ability of the Commission to handle the groundwater issue is also largely politically dominated. This conclusion has also been affirmed by an engineering representative of the California Water Board. Therefore much is dependent on the spirit of willingness, which is highly unlikely in the United States, to achieve the necessary political consensus to determine the management of the border region groundwater.

In the larger U.S.-Mexico bilateral context, international water issues have repeatedly placed Mexico in the role as the petitioner of grievances. Mexico's bargaining stance with the United States has always placed it as the weaker against the overpowering. Mexico has had to accept many unilateral decisions of the United States. However, the increasing interdependence of both countries which is highlighted at the border region should make the United States think in more equitable

terms when dealing with border issues since inequitable settlements could harm the U.S. side of the border as well. Thus, even for reasons of self-interest, it is imperative that the United States promotes the advancement from initial data collection to policy formulation soon, as the groundwater may well dry up through haphazard and greedy usage.

Bibliography

Alheritiere, Dominique, "International Cooperation and Inland Waters: The Influence of Federalism." Natural Resources Journal, 16, No. 4 (1976), pp. 29-48.

Bradley, Michael D., and Kenneth J. DeCook. "Groundwater Occurrence and Utilization in the Arizona-Sonora Border Region." Natural Resources Journal, 18, No. 1 (1978), pp. 29-48.

Clark, Robert E. "Role of Legislation in Ground Water Management." Creighton Law Review, 2, No. 10 (1976), pp. 469-487.

Keating, Michael. "Water Overuse Haunts U.S. West." The Globe and Mail, August 21, 1985, p. 4.

Mumme, Stephen P. "Regional Power in National Diplomacy: The Case of the U.S. Section of the International Boundary and Water Commission." Publius: The Journal of Federalism, 14 No. 4 (1984), pp. 115-135.

Mumme, Stephen P. "U.S.-Mexico Groundwater Problems." Journal of Interamerican Studies and World Affairs, 22, No. 1 (1980), pp. 31-55.

Sewell, W.R. Derrick. "The Changing Context of Water Resources Planning: The Next 25 Years." Natural Resources Journal, 16, No.4 (1976), pp. 791-805.

Teclaff, Ludwick, and Albert E. Utton, eds. International Groundwater Law. New York: Oceana, 1981.

Utton, Albert E. "The Development of International Groundwater Law." Natural Resources Journal, 22, No.1 (1982), pp. 95-118.



Map 1. United States-Mexico Border Region. Adapted from Nestor Valencia, "Twentieth Century Urbanization in Latin America and a Case Study of Ciudad Juarez" (M.A. thesis, University of Texas at El Paso, 1969, in UTEP Archives, no. 518), p. 29.