INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

El Paso, Texas
July 3, 2003

Minute 309

VOLUMES OF WATER SAVED WITH THE MODERNIZATION AND IMPROVED TECHNOLOGY PROJECTS FOR THE IRRIGATION DISTRICTS IN THE RIO CONCHOS BASIN AND MEASURES FOR THEIR CONVEYANCE TO THE RIO GRANDE

The Commission met at the offices of the United States Section in El Paso, Texas at 3:00 p.m. on July 3, 2003, to address the stipulations in recommendation No. 2 of Commission Minute No. 308, entitled "United States Allocation of Rio Grande Water During the Last Year of The Current Cycle", dated June 28, 2002, relative to the fact that the Commission will provide its observations to the two governments and to the North American Development Bank (NADBank), with respect to the estimated volumes of water saved by the projects undertaken by the Government of Mexico to modernize and improve the technology of the Irrigation Districts and Units in the Rio Grande Basin making them sustainable and taking the necessary measures to ensure the conveyance of the saved waters to the Rio Grande.

Part I. - Volumes of Water Conserved

The Commissioners noted the information provided by the Government of Mexico relative to the modernization and improved technology projects proposed for the three Irrigation Districts in the Rio Conchos basin: District 005 Delicias, supplied by La Boquilla Dam located on the Rio Conchos and the Francisco I. Madero Dam located on the Rio San Pedro; Irrigation District 090 Lower Rio Conchos, supplied by the Luis L. Leon Dam located on the Rio Conchos; and District 103 Rio Florido, supplied by the San Gabriel and Pico de Aguila Dams located on the Rio Florido. The Commissioners also noted that the modernization and technology works referenced in Minute No. 308 will be initiated in the three irrigation districts on the Rio Conchos, and the $40 million that corresponds to Mexico from the Water Conservation Investment Fund, created by the NADBank from its retained earnings, following completion of required NADBank approvals and procedures, will be applied totally toward the works in Irrigation District 005 Delicias, which were certified by the Border Environment Cooperation Commission (BECC) on October 17, 2002. The Commissioners observed that the construction projects started at the end of 2002 and ending in 2006, yielding, as a result, water savings that will increase annually until reaching, upon completion of the works, a savings estimated to be 321,043 acre-feet - <af> (396 Million Cubic Meters-<Mm^3>) annually, considering a base volume of water of 846,385 af (1,044 Mm^3), which was the average releases from the dams for the years 1996, 1997 and 1998, measured upon release from the storage dams

that supply each district as shown below:

Irrigation District	Base Volume		Savings	
	af	Mm^3	af	Mm^3
005 Delicias and Labores Viejas	694,782	857	278,075	343
090 Lower Rio Conchos	77,828	96	20,268	25
103 Rio Florido	73,775	91	22,700	28
Total	846,385	1,044	321,043	396

The Commissioners also observed the information from Mexico in the sense that in order to attain the estimated total water savings, a capital investment will be required in the amount of $1,535,000,000 pesos, and that the program of water savings will be subject to the timely availability of resources for its implementation. If this level of investment is not allocated the amount of savings may be reduced.

The Commissioners also observed from the information provided by Mexico that of the total water savings estimated at 321,043 af (396 Mm^3), 21,484 af (26.5 Mm^3) would be reached in the first year, another 86,748 af (107.0 Mm^3) in the second year, another 137,418 af (169.5 Mm^3) in the third year, and another 75,398 af (93.0 Mm^3) in the fourth year.

In the following table the investments required in million pesos and the estimate volumes of savings in thousand acre-feet and millions of cubic meters appear.

	Year 1		Year 2		Year 3		Year 4		Total	
Irrigation District	Investment	Savings (Mm^3)	Investment	Savings (Mm^3)	Investment	Savings (Mm^3)	Investment	Savings (Mm^3)	Investment	Savings (Mm^3)
005 Delicias and Labores Viejas	78.5	16.2 (20.0)	357.0	73.0 (90.0)	594.0	121.6 (150.0)	330.5	67.3 (83.0)	1,360.0	278.1 (343.0)
090 Lower Rio Conchos	15.0	2.8 (3.5)	38.0	7.3 (9.0)	42.0	7.7 (9.5)	15.0	2.4 (3.0)	110.0	20.2 (25.0)
103 Rio Florido	5.5	2.4 (3.0)	18.0	6.5 (8.0)	23.0	8.1 (10.0)	18.5	5.7 (7.0)	65.0	22.7 (28.0)
TOTAL	**99.0**	**21.4 (26.5)**	**413.0**	**86.8 (107.0)**	**659.0**	**137.4 (169.5)**	**364.0**	**75.4 (93.0)**	**1,535.0**	**321.0 (396.0)**

The Commissioners observed that the Government of Mexico considered that the estimated volumes of water conserved by the proposed modernization and technology activities are similar to water savings from projects carried out in other irrigation districts in Mexico and the estimated volumes of water saved were determined utilizing two methodologies, which were

provided to the Commission and discussed in the meeting of November 7, 2002, in the main offices of the Mexican Section.

In both methodologies, the volume of water saved is a function of the increase in the global efficiency of an irrigation district in a given year with regard to the baseline year of reference. The conveyance and application efficiencies are established on the two dates being compared.

One methodology calculates the conveyance efficiency based on inflow and outflow balances in the system; the application efficiency is a function of the water being applied and crop requirements.

The other methodology determines the conveyance efficiency by considering the total canal length, including those to be lined, as well as the efficiencies of existing lined and unlined canals, so that application efficiency considers the irrigated surface areas and efficiencies for each type of improved irrigation technology works against the current irrigated surface areas and efficiencies in the district.

- The Commissioners observed that the principal modernization and improved technology activities are the following: The lining of canals to reduce losses in: 7.5 miles - (mi) <12 kilometers - (km)> of main canals, 321.9 mi (518 km) of lateral canals, and 130.5 mi (250km) in smaller systems. The control structures will be improved and measurement structures will be installed to improve the operation of the distribution network and the delivery of water to the irrigation users.
- The installation of low pressure supply systems for water distribution and the application of water with multi-gate pipes on 56,216 acres - (ac) (22,750 hectares - ha), to take advantage of the existing hydraulic head and reduce losses and maintenance.
- Land leveling of 80,309 ac (32,500 ha) to reduce water losses in gravity flow irrigation. The rehabilitation of stilling wells and pumping equipment, water distribution in high pressure lines and the implementation of drip irrigation or sprinkler systems in 49,421 ac (20,000 ha), of fruits, vegetables and alfalfa.
- The construction of pumping stations, supplied by open channels, low pressure water distribution networks and the application of water with multi-gated piping on 34,595 ac (14,000 ha). The rehabilitation of stilling wells and pumping equipment, the distribution of the water by low pressure lines tubing and the irrigation with multi-gated piping on 17,298 ac (7,000 ha). In both cases crops such as cereals, bean, cotton, peanuts and olive trees will be irrigated.

Upon completion of construction of the infrastructure modernization and irrigation technology works, the global efficiency in the irrigation districts is estimated to increase: from 33 to 55 percent in Irrigation District 005, Delicias; from 35 to 47 percent in Irrigation District

090, Lower Rio Conchos; and from 33 to 48 percent in Irrigation District 103, Rio Florido.

The Commissioners observed that Mexico's National Water Commission (CNA), will prepare an annual report on: a) The volume of water released from the storage dams in the three irrigation districts on the Rio Conchos, b) The types and areas of crops irrigated with waters from the storage dams, c) The efficiency reached by each district, d) The volume of water saved through the modernization and improved technology activities, e) The progress made during the past year regarding works constructed and amounts expended, f) The volumes saved transferred to the Rio Grande and, g) The program of activities proposed for the following year. This report will be sent to Mexico's Secretariat of Foreign Relations during the last week of November of each year, which will provide it to the International Boundary and Water Commission.

Part II. - Measures necessary to ensure conveyance to the Rio Grande

The Commissioners noted the information of the Government of Mexico in the sense that the volume estimated at 321,043 af (396 Mm^3) would be saved considering the use of an annual volume of 846,385 af (1,044 Mm^3) in conditions prior to the improved modernization and technology works. The volume saved is measured at the release points from the storage dams that supply each irrigation district. They observed that in the years in which the volumes of water released to the irrigation districts from the storage dams and registered at the same release points are less than 846,385 af (1,044 Mm^3), the volumes saved will be proportionally reduced. In these cases, the saved volumes will be determined by CNA, using the methodology described in Part I of this Minute. This information will be sent to Mexico's Secretariat of Foreign Relations to be reviewed by the International Boundary and Water Commission.

The Government of Mexico will transfer to the Rio Grande the saved volumes of water taking into account the attainment of the annual average deliveries in accordance with the "Treaty between the United States of America and Mexico for the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande", signed on February 3, 1944, as well as any volume that could be applied to cover shortages in a previous cycle.

The Commission took note of the legal and regulatory framework, as well as of the operation of the hydraulic system that will be established by the Mexican government to transfer the volume of water saved in the three Rio Conchos irrigation districts to the Rio Grande in the following way:

- The volumes of water saved by the modernization and technology projects in any given agricultural year will be transferred from the San Gabriel-Pico de Aguila and La Boquilla-Francisco I. Madero dam systems and Luis L. Leon Dam during December and January of each year. The transfer to the Rio Grande of the volumes saved that arrive at Luis L. Leon Dam plus the volumes saved pertaining to the Irrigation District 090 Lower

Rio Conchos will begin in January of each year.

- The Government of Mexico, through the CNA, will install, operate and maintain automatic gauging stations at strategic points on the Florido, Conchos and San Pedro Rivers, downstream of Pico de Aguila, La Boquilla, Francisco I. Madero and Luis L. Leon dams, to provide monitoring of releases of the saved volumes from the said dams.
- The Government of Mexico, through the CNA, will have legal authority over the volume of water saved and will ensure its conveyance to the Rio Grande, after joint technical analysis by CNA and the Commission as previously described.

The Commissioners observed that, because the modernization and technology projects in the three Rio Conchos irrigation districts will occur over several years, it is important that the Commission be informed of the advances reached annually, regarding works, investments and volumes of water saved, as well as the program of activities proposed for the following year. Also, they noted that the Government of Mexico, through CNA, will provide the required technical information and allow physical access to project sites, at a frequency the Commission considers appropriate, so it can conduct joint field observations to view the construction and progress of works.

The Commissioners took note of the exchange of letters by the Department of Treasury of the United States, and the Secretaría de Hacienda y Crédito Público de México on June 28, 2002, regarding the potential financial support for water conservation projects in Mexico.

Based on the above, the Commissioners recommend the following for the approval of the two governments:

1. That this Minute constitutes the report that Minute No. 308 stipulated that the Commission present to the two Governments and to the NADBank regarding the modernization and technology projects proposed for the three Rio Conchos irrigation districts, to be executed between the end of 2002 and the end of 2006, which will generate savings that will increase annually until they reach, at their completion, an annual volume estimated at 321,043 af (396 Mm^3). The volume is estimated on an average of 846,385 af (1,044 Mm^3), measured at the release points from the storage reservoirs that supply each irrigation district, as described in Part I of this Minute. The modernization and technology works stated in Minute No. 308 will be initiated by the three irrigation districts of the Rio Conchos and the $40 million that corresponds to Mexico from the Water Conservation Investment Fund, created from the NADBank's retained earnings, following completion of required NADBank approvals and procedures, will be applied totally to the works in the Delicias Irrigation District No. 005, which were certified by BECC on October 17, 2002.
2. In order to attain the estimated total water savings, a capital investment will be required in the amount of $1,535,000,000 pesos, and the program of water savings will be subject to the timely availability of resources for its implementation. If this level of investment is not allocated, the

amount of savings may be reduced.

3. When the volumes of water released to the irrigation districts from the storage dams and registered at the same release points are less than 846,385 af (1,044 Mm^3), the volumes saved will be proportionally reduced.

4. The Government of Mexico through the CNA, will prepare an annual report on: a) The volume of water released from the storage dams in the three irrigation districts on the Rio Conchos, b) The types and areas of crops irrigated with waters from the storage dams, c) The efficiency reached by each district, d) The volume of water saved through the modernization and improved technology activities, e) The progress made during the past year regarding works constructed and amounts expended, f) The volumes saved transferred to the Rio Grande and, g) The program of activities proposed after the following year. This report will be sent to Mexico's Secretariat of Foreign Relations during the last week of November of each year and discussed within the Commission, as outlined in Part II of this Minute.

5. The Government of Mexico, through CNA, will have legal authority over the volume of water saved as a result of the modernization and technology works that are mentioned in Part I of this Minute.

6. The Government of Mexico will transfer to the Rio Grande the saved volumes of water taking into account the attainment of the annual average deliveries in accordance with the 1944 Water Treaty, as well as any volume that could be applied to cover shortages in a previous cycle.

7. The Government of Mexico through CNA, will install, operate and maintain automatic gauging stations at strategic points on the Florido, Conchos and San Pedro Rivers, downstream of Pico de Aguila, La Boquilla, Francisco I. Madero and Luis L. Leon dam systems, to provide monitoring of the volumes saved from the said dams.

8. The volumes of water saved by the modernization and technology projects in any given agricultural year will be transferred from the San Gabriel-Pico de Aguila and La Boquilla-Francisco I. Madero dam systems and Luis L. Leon Dam during December and January of each year. The transfer to the Rio Grande of the volumes saved that arrive at Luis L. Leon Dam plus the volumes saved pertaining to the Irrigation District 090 Lower Rio Conchos will begin in January of each year. Transfers will be accomplished as described in Part II of this Minute.

9. The Government of Mexico, through CNA, will provide the required technical information and allow physical access to facilities so that the International Boundary and Water Commission can conduct joint field observations to view the construction and advancement of works, at a frequency it considers appropriate.

10. That both Governments continue giving priority to the development of water conservation projects consistent with the terms, objectives and spirit of cooperation of Minute No. 308 and the present Minute.

11. That this Minute will enter into force upon notification of approval by the Governments of he United States of America and Mexico through the respective Sections of the Commission.

The meeting was adjourned:

Carlos M. Ramírez
United States Commissioner

J. Arturo Herrera Solís
Mexican Commissioner

Carlos Peña, Jr.
Secretary of the United States Section

Jesus Luevano Grano
Secretary of the Mexican Section