

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO.

Ciudad Juarez, Chihuahua
September 21, 2017

MINUTE NO. 323

**EXTENSION OF COOPERATIVE MEASURES
AND ADOPTION OF A BINATIONAL WATER SCARCITY CONTINGENCY PLAN
IN THE COLORADO RIVER BASIN**

The Commissioners met in Ciudad Juarez, Chihuahua on September 21, 2017 at 4:00 p.m. to consider extending or replacing the international joint cooperative measures agreed to in Minute No. 319, "Interim International Cooperative Measures in the Colorado River Basin through 2017 and Extension of Minute 318 Cooperative Measures to Address the Continued Effects of the April 2010 Earthquake in the Mexicali Valley, Baja California," signed on November 20, 2012 in Coronado, California, and adopting a Binational Water Scarcity Contingency Plan in the Colorado River Basin.

I. BACKGROUND

The Commissioners referred to the "United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande," signed February 3, 1944 (1944 Water Treaty), and to opportunities for cooperation in the Colorado River Basin in furtherance of the 1944 Water Treaty. The Commissioners referred to joint cooperative activities that preceded Minute 319, including agreements related to environmental issues, the establishment of a framework for discussion of Colorado River joint cooperative actions, and response to the effects of the 2010 earthquake in the Mexicali Valley, Baja California, among others.

The Commissioners observed that Minute 319 established the U.S. and Mexican governments' intention to complete a comprehensive Minute, with an implementation timeline through no later than December 31, 2026, that expands or replaces the substantive provisions of Minute 319. They further referred to the binational meeting convened by the Commissioners in San Diego, California on May 14, 2015, with the participation of local, state, and federal governmental officials and other stakeholders from the United States and Mexico, at which the Commissioners affirmed their governments' interest in continuing the joint cooperative process and requested those participants to assist in developing a successor Minute to Minute 319.

The Commissioners also noted greater uncertainty in the outlook for basin conditions since the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead were adopted in the United States in 2007 (2007 Interim Guidelines), and since Minute 319 was signed in 2012; this requires the governments and stakeholders to seek mechanisms to avoid reaching critically low reservoir elevations. Recognizing these changed conditions, the

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Commissioners expressed a clear need for continued and additional actions due to the impacts on Colorado River storage resulting from various factors, including meeting system demands, the effects of hydrologic conditions, and increased temperatures.

The Commissioners referred to the results achieved in the Minute 319 pilot program on water for the environment, in particular the pulse flow of 2014, and reflected on how to continue the program and maintain its benefits. The Commissioners also recognized that throughout the negotiation of this agreement, they have employed various binational work groups on Hydrology, Salinity, Flow Variability, Environment, Projects and the All-American Canal Turnout to facilitate the analysis and consideration of the elements that should be incorporated into this Minute. The Commissioners further observed a shared desire to maintain existing binational work groups or to establish additional binational work groups to implement various elements of this Minute.

Based on the consultations undertaken and the progress on each issue and particular project, the Commissioners identified the following cooperative measures:

II. DISTRIBUTION OF FLOWS UNDER HIGH ELEVATION RESERVOIR CONDITIONS

The Commissioners considered the appropriateness of coordinating basin operations under high elevation reservoir conditions, noting the importance of aligning operations for both countries. This cooperative approach will result in deliveries to Mexico of volumes of water in addition to the normal annual delivery of 1,500,000 acre-feet (1,850,234,000 cubic meters) stipulated in Article 10(a) of the 1944 Water Treaty when the basin is in a condition such that Lake Mead elevation is projected to be at or above 1,145 feet mean sea level (msl) and Colorado River mainstream water is available for delivery to U.S. water users in the Lower Basin under the 2007 Interim Guidelines. With this understanding, this cooperative approach will be carried out as follows:

- A. In years when Lake Mead is projected to be at or above elevations specified in the following table on January 1 of the following year, Mexico may increase its order for Colorado River system water as follows:

Lake Mead Elevation (feet msl)	Mexico Annual Increase
At or above 1,145 and below 1,170	40,000 acre-feet (49 mcm)*
At or above 1,170 and below 1,200	55,000 acre-feet (68 mcm)
At or above 1,200 and flood control releases are not required	80,000 acre-feet (99 mcm)
When flood control releases are required, regardless of elevation	200,000 acre-feet (247 mcm)

*mcm stands for million cubic meters

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- B. For purposes of making the determinations under paragraph II.A above, the Commission will request from the United States Department of the Interior, Bureau of Reclamation (Reclamation) the August 24-Month Study, which will be used to project the January 1 elevations of Lake Mead. The Commission will review the results of said study and provide it to Mexico's National Water Commission (CONAGUA) through the Mexican Section. The 24-Month Study refers to the operational study conducted each month by Reclamation to project future reservoir operations.
- C. Prior to scheduling delivery of increased flows at high elevation reservoir conditions, the Commission will meet and each Section will consult with its respective authorities or stakeholders with regard to the impact to the basin of taking or not taking increased deliveries.
- D. For delivery of increased flows at high elevation reservoir conditions, the Mexican Commissioner will provide a timely notification to the United States Commissioner of the schedule for increased releases in the subsequent year, indicating the volumes, months, and delivery points in which the delivery of said volumes is desired.
- E. The provisions of this Minute will not affect the operation of Article 10(b) of the 1944 Water Treaty, which provides that additional waters of the Colorado River system may be delivered to Mexico up to 200,000 acre-feet (246,697,000 cubic meters) for a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters).

III. DISTRIBUTION OF FLOWS UNDER LOW ELEVATION RESERVOIR CONDITIONS

The Commissioners considered the appropriateness of coordinating basin operations under low elevation reservoir conditions, as was done in Minute 319, noting the importance of aligning operations for both countries. The United States and Mexico recognize that it is in their mutual interests to continue to proactively address the potential for unprecedented reductions on the Colorado River, which would occur when major Colorado River reservoirs reach critical elevations. If these major reservoirs reach critical elevations as a result of hydrologic conditions, meeting system demands, and increased temperatures in the basin, it may no longer be operationally possible to deliver each country's full amount of Colorado River water, which would result in reductions in Colorado River deliveries and adversely affect the interests of water users in both countries.

The Commissioners observed that in the framework of this joint cooperative process, the information regarding Lake Mead reservoir elevations and correlations with drought indicators has been exchanged and modeling has been conducted jointly for the

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purpose of analyzing rainfall and runoff behavior and other factors. The Commissioners also observed that it is appropriate to use the elevation of Lake Mead as the trigger for potential reductions during the term of this Minute.

The Commissioners made note that under the 2007 Interim Guidelines, the following water delivery reductions are applied in the United States: 333,000 acre-feet (411 mcm) when the January 1 Lake Mead elevation is projected to be at or below 1,075 feet msl and at or above 1,050 feet msl; 417,000 acre-feet (514 mcm) when the January 1 Lake Mead elevation is projected to be below 1,050 feet msl and at or above 1,025 feet msl; and 500,000 acre-feet (617 mcm) when the January 1 Lake Mead elevation is projected to be below 1,025 feet msl.

Considering the above, as well as current conditions, projected water availability, potential water shortage in the Colorado River Basin, and the benefit of preventative and proactive management of the basin, the Mexican Commissioner expressed the willingness of the Government of Mexico to implement the measures outlined below, and the United States Commissioner agreed with such measures. These measures will apply as follows:

- A. Water delivery reductions to Mexico: 50,000 acre-feet (62 mcm) when the January 1 Lake Mead elevation is projected to be at or below 1,075 feet msl and at or above 1,050 feet msl; 70,000 acre-feet (86 mcm) when the January 1 Lake Mead elevation is projected to be below 1,050 feet msl and at or above 1,025 feet msl; and 125,000 acre-feet (154 mcm) when the January 1 Lake Mead elevation is projected to be below 1,025 feet msl.
- B. The Commission will request from the Bureau of Reclamation the August 24-Month Study, which will be used for projecting the January 1 elevations of Lake Mead referenced in paragraph III.A above.
- C. Prior to December 31, 2026, Mexico may adjust its order to include deliveries from Mexico's Water Reserve, as defined in paragraph V.D, up to a volume to offset the reductions described in paragraph III.A above, not to exceed a total annual delivery to Mexico of 1,500,000 acre-feet (1,850,234,000 cubic meters).
- D. When the January 1 elevation of Lake Mead is projected to be at or below elevation 1,045 feet msl, the Commission will meet to discuss measures that could be undertaken, recognizing that reductions in both countries may need to increase.
- E. In order for the Government of Mexico to continue to systematically track the basin conditions and prepare in a timely manner for any eventual reductions in its deliveries, the Government of the United States will provide the most current

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information to Mexico on basin conditions as often as required, including precipitation, streamflow, and water storage conditions in the basin and their historical behavior; the consumptive water uses for the different basin states and the historical trend; and the status of the determination of shortage conditions in the Colorado River Basin within the United States, including, on a monthly basis, the 24-Month Study. At least 30 days prior to annual publication of any August 24-Month Study that projects low elevation reservoir conditions for the upcoming calendar year, the Commission will develop a communications plan that provides for simultaneous notification in both countries.

- F. In years when Lake Mead is projected to be at or below the elevations identified in paragraph III.A on January 1, the United States will furnish to Mexico, through the Commission, information on the natural causes for the projected reservoir elevation of Lake Mead.
- G. The Binational Hydrology Work Group, with Federal and State participation, will undertake certain activities during the course of this Minute as follows:
 - 1. Continue to follow and update the Minute 319 Binational Basin Conditions and Hydrology Team Communications Plan, and, in accordance with the plan, meet regularly to review basin conditions and projections.
 - 2. Prepare an annual report and, by December 31, 2026, a final report that include recommendations to the Commissioners of the activities described in numbers 3 to 7 below.
 - 3. Study and analyze data related to the basin, considering runoff, reservoir elevations, and other considerations, to identify mechanisms to enable the United States and Mexico to engage in joint planning activities and decision making in both countries for the period following 2026.
 - 4. Identify acceptable levels of risk of reaching certain low elevation reservoir conditions and the probability of reaching those levels. Further, recognizing the goal of protecting water supplies for both countries while reducing salinity impacts, the work group will analyze and identify the potential impacts of low reservoir levels on salinity and explore binational actions to address them.
 - 5. Explore potential additional actions in the United States and Mexico to reduce the risk of Lake Mead falling below elevation 1,075 feet msl and

each subsequent shortage tier described in this Section III, elevations at which both countries have unrecoverable reductions.

6. Recognizing that the Binational Water Scarcity Contingency Plan as described in this Minute and the U.S. drought contingency efforts may be insufficient to protect the Colorado River system from reaching critically low reservoir storage, the Binational Hydrology Work Group will discuss additional actions that could be considered by the Commission.
7. Analyze the impact on the Colorado River system of the United States and Mexico foregoing delivery of additional waters under high elevation reservoir conditions that they would otherwise be entitled to receive.

IV. BINATIONAL WATER SCARCITY CONTINGENCY PLAN

The Commissioners observed that, in accordance with the analysis and models undertaken by the Binational Hydrology Work Group, the application by themselves of the Minute 319 measures as reflected in Section III of this Minute, the 2007 Interim Guidelines, and voluntary conservation measures is not sufficient to reduce the risk of temporary or prolonged interruptions in water supplies that would result in adverse impacts on the society, environment, and economy of the Colorado River system.

Considering the above, the United States and Mexico share a common vision on a clear need for additional and continued actions due to the impacts on Lake Mead elevation from meeting system demands, hydrologic conditions, increased temperatures, and other factors.

For this reason, the United States and Mexico need to take additional immediate measures to protect and benefit the Colorado River system by seeking to avoid reaching critical reservoir elevations at Lake Mead. To accomplish this, the Commissioners noted the interest in adopting a Binational Water Scarcity Contingency Plan that provides for each country to save specified volumes of water at certain low reservoir elevations for recovery at a later date when reservoir conditions improve. By saving agreed-upon amounts of water through this plan, they will significantly reduce the risk of critically low reservoir elevations.

The Commissioners made note of various elements of a U.S. Lower Basin Drought Contingency Plan that currently is under development. The proposed plan contains the following water contributions applicable to the United States:

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Projected January 1 Lake Mead Elevation (ft msl)	U.S. Savings that Contribute to the Lower Basin Drought Contingency Plan
At or below 1,090 and above 1,075	200,000 acre-feet (247 mcm)
At or below 1,075 and above 1,050	200,000 acre-feet (247 mcm)
At or below 1050 and above 1,045	200,000 acre-feet (247 mcm)
At or below 1,045 and above 1,040	450,000 acre-feet (555 mcm)
At or below 1,040 and above 1,035	500,000 acre-feet (617 mcm)
At or below 1,035 and above 1,030	550,000 acre-feet (679 mcm)
At or below 1,030 and above 1,025	600,000 acre-feet (740 mcm)
At or below 1,025	600,000 acre-feet (740 mcm)

In light of the above, the Mexican Commissioner stated the willingness of the Mexican government to implement the measures of the Binational Water Scarcity Contingency Plan, described below, provided a U.S. Lower Basin Drought Contingency Plan is put into effect, and the U.S. Commissioner agreed with such measures; therefore, the following water savings will be applied to Mexico:

Projected January 1 Lake Mead Elevation (ft msl)	Mexico's Savings that Contribute to the Binational Water Scarcity Contingency Plan
At or below 1,090 and above 1,075	41,000 acre-feet (51 mcm)
At or below 1,075 and above 1,050	30,000 acre-feet (37 mcm)
At or below 1,050 and above 1,045	34,000 acre-feet (42 mcm)
At or below 1,045 and above 1,040	76,000 acre-feet (94 mcm)
At or below 1,040 and above 1,035	84,000 acre-feet (104 mcm)
At or below 1,035 and above 1,030	92,000 acre-feet (113 mcm)
At or below 1,030 and above 1,025	101,000 acre-feet (125 mcm)
At or below 1,025	150,000 acre-feet (185 mcm)

For the purpose of making the determinations provided for in the above tables, the August 24-Month Study prepared by Reclamation will be used to project Lake Mead elevations on January 1 of the following year.

The water savings under the Binational Water Scarcity Contingency Plan and a U.S. Lower Basin Drought Contingency Plan are recoverable, including when reservoir conditions improve such that the August 24-Month Study projects Lake Mead to reach a January 1 elevation in the following year equal to or greater than 1,110 feet msl, subject to certain limitations such as evaporation losses. In any given year, the total annual scheduled delivery to Mexico may not exceed 1,700,000 acre-feet (2,096,931,000 cubic meters).

The implementing details of both plans should be in harmony to ensure parity and equivalent implementation of these important efforts. The following elements of both

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contingency plans will be identical: a) evaporation/losses, b) recovery timing and limitations, and c) the term for recovery.

Section IV will take effect only after the U.S. Commissioner communicates to the Mexican Commissioner that the United States Secretary of the Interior has provided notice that a U.S. Lower Basin Drought Contingency Plan, consistent with the water savings described in the first table of Section IV, is effective as authorized by U.S. Federal law. Within 100 calendar days of the date the U.S. Commissioner notifies the Mexican Commissioner, the implementing details of the Binational Water Scarcity Contingency Plan will be specified in a Joint Report of the Principal Engineers.

V. EXTENSION OF COOPERATIVE MEASURES TO ADDRESS POTENTIAL EMERGENCIES IN MEXICO, ESTABLISHMENT OF A REVOLVING ACCOUNT, AND INTENTIONALLY CREATED MEXICAN ALLOCATION (ICMA)

- A. The Commissioners observed that it would be appropriate to allow Mexico to continue to be able to defer delivery of a portion of its allotment of Colorado River water under the 1944 Water Treaty in order to address potential emergencies, such as earthquakes, failures in the conveyance system, unforeseeable circumstances or force majeure, among others, which could prevent Mexico from using its full allotment of water, similar to the deferral mechanism established in Minute No. 318, "Adjustment of Delivery Schedules for Water Allotted to Mexico for the Years 2010 through 2013 as a Result of Infrastructure Damage in Irrigation District 014, Rio Colorado, Caused by the April 2010 Earthquake in the Mexicali Valley, Baja California," dated December 17, 2010, and Minute No. 319. This water will be known as "Emergency Storage."
- B. Similarly, the Commissioners observed the appropriateness of establishing a Revolving Account for Mexican waters in storage in the United States. The Revolving Account involves replenishing up to a volume of 366,136 acre-feet (451.623 mcm) of water, the cumulative volume deferred in accordance with the provisions of Minutes 318 and 319. The Revolving Account will include any remaining balance of volumes deferred under Minutes 318 and 319.
- C. Further, the Commissioners noted Mexico's interest in maintaining the ability to generate Intentionally Created Mexican Allocation (ICMA) by deciding to defer delivery of water volumes through adjustments to its annual delivery schedule resulting from water conservation projects or new water sources projects. The ICMA balance under this Minute will include any remaining volume of ICMA created under Minute 319.
- D. The waters identified in paragraphs V.A, V.B, and V.C above will be referred to collectively as "Mexico's Water Reserve." Mexico's Water Reserve will not include

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any waters saved as part of the Binational Water Scarcity Contingency Plan described in Section IV nor reductions described in paragraph III.A.

- E. Storage and delivery of Mexico's Water Reserve are subject to the following provisions:
1. Mexico may use Mexico's Water Reserve for any purpose, subject to the specific provisions of this Minute.
 2. Mexico may create an annual maximum volume of water for Mexico's Water Reserve of 250,000 acre-feet (308 mcm) through December 31, 2026, by making a downward adjustment to the schedule for the annual delivery to Mexico of its Article 10(a) allotment under the 1944 Water Treaty.
 3. The maximum volume from Mexico's Water Reserve that may be delivered to Mexico in any one calendar year is 200,000 acre-feet (246,697,000 cubic meters) until all available water in Mexico's Water Reserve is used. In any given year, the total annual scheduled delivery to Mexico may not exceed 1,700,000 acre-feet (2,096,931,000 cubic meters).
 4. When Lake Mead is below elevation 1,025 feet msl, water from Mexico's Water Reserve will not be available for delivery.
 5. A 3% reduction for evaporation will be applied annually on December 31 to Mexico's Water Reserve beginning in the year of creation. This reduction will not be applied in years when Lake Mead elevation is below 1,025 feet msl on January 1.
 6. Whenever Mexico stores waters that it identifies as ICMA, 2% of this water will be reserved for environmental purposes in Mexico.
 7. Volumes from Mexico's Water Reserve will not be delivered to Mexico when doing so would reduce the projected January 1 elevation of Lake Mead, triggering the first water delivery reduction level (at or below 1,075 feet msl) or a subsequent water delivery reduction level (below 1,050 or below 1,025 feet msl) as provided in paragraph III.A.
 8. Mexico may create volumes for Mexico's Water Reserve in any year except when flood control releases are being made from Lake Mead.

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9. When Lake Mead is at or above 1,145 feet msl, Mexico may only create volumes for Mexico's Water Reserve by means of a conservation or new water sources project or due to an emergency in accordance with paragraph V.A above. The Mexican Commissioner will submit a letter to the United States Commissioner describing the conservation or new water sources project or the emergency if applicable.
10. If during the effective period of this Minute, flood control releases are foreseeable, the United States and Mexico will cooperate and communicate regarding management of Mexico's Water Reserve, such that Mexico may potentially make use of this water. The Commission will establish a Binational System Operations Work Group to explore options for beneficial use of this water, including direct use or water exchanges, downstream storage, groundwater storage, environmental uses or aquifer recharge prior to or during flood control years. When there are flood control releases from Lake Mead, Mexico's Water Reserve will be treated in such a manner that ensures parity with U.S. waters stored as "Intentionally Created Surplus" under the 2007 Interim Guidelines.
11. Given that in years when Mexico is scheduled to receive 1,700,000 acre-feet (2,096,931,000 cubic meters) in accordance with Article 10(b) of the 1944 Water Treaty, it is possible that volumes in excess of this amount may be released into the Colorado River, the United States and Mexico will cooperate and communicate regarding management of Mexico's Water Reserve, such that Mexico may potentially make use of it.
12. The Mexican Commissioner will provide timely notification to the United States Commissioner of the creation of water for Mexico's Water Reserve by means of a letter indicating the total volume, the specific volumes for each category (Emergency Storage, Revolving Account, and ICMA), and the schedule for the creation of volumes for Mexico's Water Reserve. The United States and Mexico will consider operational constraints to ensure that creation of Mexico's Water Reserve does not adversely affect U.S. operations.
13. For delivery to Mexico of water from Mexico's Water Reserve, the Mexican Commissioner will submit a request for the corresponding delivery to the United States Commissioner, indicating the volumes and months in which the delivery of said volumes is required, including the volumes for each category (Emergency Storage, Revolving Account, and ICMA). The United States Commissioner, upon receipt of the

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request and in consultation with the United States Secretary of the Interior, will review the Colorado River system's status and approve the order subject to available balances of Mexico's Water Reserve as well as operational issues identified in the review of the Colorado River system's status, taking into consideration the desire of both countries to schedule the delivery from Mexico's Water Reserve so as to avoid triggering the first water delivery reduction level (at or below 1,075 feet msl) or a subsequent water delivery reduction level (below 1,050 or below 1,025 feet msl) as provided in Section III of this Minute and to avoid potential adverse effects on United States operations. Reclamation will forward to the Commission the water accounting records that will be used by the Commission to account for the creation, delivery, and resulting balances of Mexico's Water Reserve.

14. Beginning on January 1, 2027, Mexico may order delivery from Mexico's Water Reserve only when the elevation of Lake Mead is greater than 1,075 feet msl but cannot order delivery of such water when the elevation of Lake Mead is at or below 1,075 feet msl; delivery of these volumes remains subject to the terms established in paragraphs V.E. 1, 3, 4, 5, 7, 10, and 13.
15. Water created under paragraph V.A (Emergency Storage) or paragraph V.B (Revolving Account) may be converted to ICMA. The Mexican Commissioner will submit a letter to the United States Commissioner requesting this change, and the Commission will update its water accounting records accordingly.
16. Through December 31, 2026, Mexico may accumulate a maximum balance in Mexico's Water Reserve not to exceed 1,500,000 acre-feet (1,850,234,000 cubic meters).
17. At least annually, the Commission will prepare a record of the volumes of water in each category: Emergency Storage, Revolving Account, and Intentionally Created Mexican Allocation.

VI. SALINITY

The Commissioners referred to the provisions of Minute No. 242, "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River," dated August 30, 1973, and observed the need to comply with it.

- A. Salinity Measures During Creation and Delivery of Mexico's Water Reserve and recoverable savings as described in Section IV of this Minute.

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1. The salinity differential will be calculated using the formula developed in the Binational Salinity Work Group. This procedure was documented by means of an exchange of letters of the Principal Engineers completed on July 25, 2017.
2. The Commissioners observed the appropriateness of minimizing salinity impacts during years in which Mexico is creating Mexico's Water Reserve or recoverable savings as follows:
 - a. Mexico may continue to use the Wellton-Mohawk bypass drain to convey volumes it considers appropriate. The United States and Mexico will take into account operational constraints to ensure that water conveyance does not adversely affect United States water operations.
 - b. The volumes of water that Mexico conveys to the Wellton-Mohawk bypass drain and/or discharges directly to the channel of the Colorado River downstream from Morelos Dam will be added to and accounted for in their quantity and quality with the deliveries at the Northerly International Boundary (NIB) in order to comply with the volumes and salinity limits stipulated in Minute 242 and the 1944 Water Treaty.
 - c. For purposes of this section, those volumes that Mexico expressly requests to be conveyed in accordance with subparagraphs a and b above will be accounted for as part of Mexico's 1944 Water Treaty allotment.

B. Actions at the Southerly International Boundary (SIB)

The Commissioners noted the binational cooperation that has occurred on salinity management and, in particular, the infrastructure constructed by the United States to reduce the variability of flows arriving at the SIB, and a canal to bypass higher-salinity flows to improve the water quality to approximately 1,200 parts per million during four months critical for agriculture in Mexico (September, October, November, and December).

1. To improve operational capabilities at the SIB, the capacity of the Sanchez Meiorada Canal will be restored by undertaking the following actions by December 31, 2019:
 - a. The United States will provide funding of up to \$300,000 dollars to Mexico to remove sediment in the Sanchez Meiorada Canal

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and its related structures to restore its carrying capacity of 220 cubic feet per second (cfs) (6.2 cubic meters per second [cms]).

- b. After this sediment removal project is completed, Mexico will maintain the Sanchez Mejorada Canal to assure the 220 cfs (6.2 cms) capacity to enable conveyance of the scheduled deliveries at the SIB.
- c. These actions will not alter the provisions of Resolution 1.b) of Minute 242 which provide for the United States to deliver to Mexico at the SIB approximately 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. Additional Joint Cooperative Efforts

1. The following actions will be completed by December 31, 2019:
 - a. The Binational Salinity Work Group will work to modernize salinity monitoring equipment so that both countries can utilize real-time salinity levels in daily operational decision-making.
 - b. The United States will fund, install, operate and maintain electrical conductivity monitoring equipment at key measuring points including Imperial Dam, Morelos Dam, and the SIB.
 - c. The Binational Salinity Work Group will develop reporting tools to make real-time data available for operators in both countries.
2. The Binational Salinity Work Group will consider and evaluate the data in the context of the current procedures used and, if appropriate, provide further recommendations to the Commissioners to improve current procedures.

VII. MEASURES RELATED TO VARIABILITY OF FLOWS ARRIVING IN MEXICO

The Commissioners noted Mexico's ongoing concern about variability in the daily flow of water that it receives from the Colorado River with respect to its demand. To address this situation, the Commissioners agreed to maintain the Binational Flow Variability Work Group, made up of operations personnel from the United States and Mexico, to propose, analyze, and evaluate joint actions that would make it possible to

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eliminate or reduce these variations to levels that are manageable by Mexico. In light of the above, the following actions will be undertaken:

A. Immediate actions:

1. The Commission will undertake an analysis and study the application of the first paragraph of Article 10(b) of the 1944 Water Treaty, corresponding Minutes, current conditions of the system, and other factors with regards to the variability of the daily flow rate of deliveries relative to Mexico's daily request. The Commission will complete this analysis by December 31, 2018.
2. The Binational Flow Variability Work Group will undertake the following actions through the Commission:
 - a. Implement a pilot program to utilize existing storage capacity at Morelos Dam to reduce daily flow variability. The pilot program is expected to reduce flow variability and simultaneously allow the operations staff from both countries to evaluate the feasibility of and necessary actions for increasing operational storage capacity at Morelos Dam, considering current conditions, potential for periodic sediment removal from the river channel upstream of the dam, and possible infrastructure modifications.
 - b. Implement procedures to schedule deliveries at 00:00 (midnight) hour, subject to evaluation and potential modification by means of an exchange of letters of the Commissioners.
3. The United States and Mexico agree to review their operating procedures in their respective hydraulic systems with the goal of reducing variability in the daily flow rate to a tolerable limit for both countries. To do so, the United States and Mexico have identified the following targets:
 - a. Control variability in daily flow rate within 3% of Mexico's daily request.
 - b. Limit changes in Mexico's daily request to no more than 70.629 cubic feet per second (2 cubic meters per second).

B. Medium term actions to be completed by December 31, 2019:

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1. The Binational Flow Variability Work Group will undertake a comparative analysis of options for implementing regulatory storage in Mexico to include, at a minimum, storage at Morelos Dam, the Alamo Regulating Reservoir, for which a Feasibility Study was completed as part of Minute 319, and other storage options in Mexico. The costs of this study will be shared between the two governments. A report will be developed for the Commissioners' consideration that includes recommendations for implementation.
2. The United States will modernize operational technologies at the NIB and SIB to improve operational control and provide real-time data.
3. The Binational Flow Variability Work Group will analyze the operational procedures and provide recommendations to the Commissioners for implementation by December 31, 2019, with particular emphasis on:
 - a. The combined operations at the NIB and SIB.
 - b. The relationship between Mexico's monthly request and the minimum flow stipulated in Article 15 of the 1944 Treaty for the months of August, September, and October in order to consider adjusting the monthly water order.
 - c. Communications procedures between the United States and Mexico regarding daily flow rate of deliveries.

C. Long term actions

The United States and Mexico recognize that additional storage in Mexican territory is an important measure to address the challenges of variability in the daily flow rate of deliveries and will continue to rely on the efforts of the Binational Flow Variability Work Group to provide the Commissioners with recommendations through the duration of this Minute.

VIII. ENVIRONMENT

The Commissioners noted the continued interest of both governments in cooperating with regards to the riparian and estuarine ecology of the Colorado River Limitrophe and Delta as expressed in Minute 306, "Conceptual Framework for United States-Mexico Studies for Future Recommendations concerning the Riparian and Estuarine Ecology of the Limitrophe Section of the Colorado River and its Associated Delta," dated December 12, 2000, and in Minute 319. They referred to the results achieved in the Minute 319 pilot program for water for the environment, including

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enhancing the ecosystem's vegetation and wildlife, generating social and recreational benefits, improving conditions in the estuary, and recharging the aquifer. They also reflected on how to maintain the benefits of the pilot program while continuing joint cooperative efforts to provide water for the environment.

The Commissioners also noted the analysis of different scenarios undertaken by the Binational Environmental Work Group and considered the Work Group's recommendations. Specifically, the Binational Environmental Work Group has analyzed environmental benefits that could be generated under this Minute and, after considering various amounts of environmental water, recommended as a target an average annual volume of 45,000 acre-feet (55 mcm) and restoration funding of up to \$40 million dollars over the term of the Minute would be desirable to maintain existing environmental restoration sites and to benefit other sites in the Colorado River Delta riparian corridor and estuary. The group has also identified opportunities to expand the existing 1,076 acres (435 hectares) of restored native habitat to 4,300 acres (1,700 hectares).

In order to take steps towards this goal, the following actions will be undertaken:

- A. During the term of this Minute, the Governments of the United States and Mexico will coordinate with a binational coalition of nongovernmental organizations (NGOs) to share in the generation of water for the environment, as indicated in paragraph VIII.B below, with each anticipated to contribute one-third of the total. The U.S. Government share of water for the environment will be generated solely by its investment in water conservation projects in Mexico.
- B. The two Governments will each provide one-third of the following: 210,000 acre-feet (259 mcm) of water for environmental purposes within Mexico over the duration of the Minute; \$9 million dollars of funding for scientific research and monitoring; and \$9 million dollars of funding for restoration projects. The Commissioners note that the binational coalition of NGOs has pledged to provide an equivalent one-third portion of water and funding. These funding commitments for restoration projects are expected to be provided within three years of the effective date of this Minute. Water for the U.S. government environmental commitment, in the amount of 70,000 acre-feet (86 mcm), will be provided in the first five years of this Minute. Further, during the term of this Minute, the two governments will cooperate with the binational coalition of NGOs to identify additional funding, water supply sources, and to advance water conservation projects to meet the targets for environmental water and restoration recommended by the Binational Environmental Work Group.
- C. The Binational Environmental Work Group will include Federal and State representatives from the United States and Mexico as well as representatives

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from the binational coalition of NGOs, and will convene regularly during the term of this Minute on issues that include:

1. Identification of water sources and funding to achieve the desired benefits.
2. Development and maintenance of an annual comprehensive Water Delivery and Restoration Plan with the support of a binational science expert team.
3. Development within the first year of the Minute of binational criteria for restoration projects.
4. Field verification of restoration and water delivery efforts to be completed at appropriate intervals during the course of this Minute.
5. Preparation of reports every two years on progress in the Water Delivery and Restoration Plan program, to include environmental benefits achieved, water deliveries and funding toward commitments, including funding provided by private entities, acres/hectares restored/maintained, implementation progress and monitoring results.
6. Discussion of monitoring program objectives, design, and implementation based on available budget.

The above activities will be subject to consultation with the Principal Engineers, and the approval of the Commissioners as may be required.

All restoration work will be carried out in accordance with the binational criteria developed by the Binational Environmental Work Group and approved by the Commission. The Government of the United States will provide funds to the Government of Mexico through the Commission. Non-federal funding (private entities, NGOs, etc.) may be provided directly to a Mexican entity carrying out work. All funding and associated work will be reported to the Commission.

The water for the environment will be subject to reductions and savings during low reservoir conditions and application of the Binational Water Scarcity Contingency Plan in amounts that are proportionate to the reductions and savings applied to Mexico's total water deliveries under paragraph III.A and Section IV.

The Commissioners noted the importance of designating for the environment a portion of the water generated in Mexico and including it as part of Mexico's Water

Reserve in order to provide for the delivery of variable quantities of water to the environment from year to year, considering the recommendations of the Binational Environmental Work Group. The Commission will keep a record of the volumes designated and delivered for this purpose.

IX. INVESTMENTS AND PROJECTS

The Commissioners observed the appropriateness of continuing to develop and construct projects and implement actions that conserve or augment Colorado River water supplies through the mechanism of investments in infrastructure that will enable a portion of the water generated to be used for environmental water needs, and another portion to be distributed between the two countries for a fixed period as was done in Minute 319. They also observed the potential benefits of generating water for the Colorado River system to help maintain Lake Mead reservoir levels and reduce the likelihood of shortages (system water).

A. Water Conservation Projects

The Commissioners referenced the Binational Projects Work Group recommendations and observed that mutual benefits could be obtained by undertaking construction of international projects in Mexico and implementing international actions that generate or conserve volumes of water, a portion of which could be used for different uses including to offset reductions during low elevation reservoir conditions. In that context, the Commissioners observed the possibility of developing and implementing conservation projects in the following categories:

1. Canal lining
2. On-farm conservation
3. Regulating reservoirs
4. Fallowing
5. Modernization and technical improvements to irrigation districts
6. System operational improvements
7. Creation of wetlands and wastewater effluent reuse

The United States will contribute a total amount of \$31.5 million dollars to Mexico, through the Commission, to develop conservation projects in Mexico. All of the waters generated or conserved from this investment will be allocated to Mexico except for the following volumes: 70,000 acre-feet (86 mcm) of water to satisfy the U.S. commitment noted in Section VIII above to provide water for the environment, especially the Colorado River Limitrophe and Delta; 50,000 acre-feet (62 mcm) of water for the system to the benefit of all users; and, 109,100 acre-feet (135 mcm) of water for use in the United States in consideration for the referenced investments. It is anticipated that the binational coalition of NGOs, in fulfilling part of its commitment to provide water for the

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environment, will fund a project for creation of wetlands and wastewater effluent reuse consistent with item 7 above in the approximate amount of \$1 million dollars to generate water for ongoing delivery into the Rio Hardy system for environmental purposes.

Of the total investments in projects under this Minute, the investment to generate the volume of 109,100 acre-feet (135 mcm) of water described in the above paragraph will not be less than \$5.0 million dollars through December 31, 2020, not less than \$10.0 million dollars through December 31, 2023, and not less than \$15.0 million dollars through December 31, 2026.

During the effective period of this Minute, Mexico will take the actions necessary to fulfill its obligations in the same proportion and at the same time as the U.S. fund transfers are made. The above will be formalized by means of an exchange of letters of the Commissioners who will confirm the receipt of funds and simultaneous provision of water from Mexico's Water Reserve or from any other source.

Both governments recognize and accept that, before the United States provides funding for projects under this Minute, the transfer agreed to in Section III.6.e.iii of Minute 319 will take place on or before December 31, 2017.

The Binational Projects Work Group will:

- Meet at least twice per year with all project funders and the Principal Engineers to review projects underway or to be developed to generate the amount of water identified in the second paragraph of this Section IX.A. The project funders for the United States include water agencies, Reclamation, and NGOs.

- As needed, review requests by either country to consider additional projects.

If the Binational Projects Work Group identifies additional projects or actions to be considered for inclusion in this program, it will forward to the Commissioners the projects' executive summaries that include the amount of water to be generated, the funding commitment, the volume of water that will be provided to the United States in consideration of its investment, the schedule for funding and water transfers, and any other project details. The Commissioners will review the project executive summaries and engage in appropriate consultations in their respective countries. If, as a result of said consultations, any additional project is determined to be appropriate, the Commissioners will agree to it by means of an exchange of letters. Implementation of any such projects will be considered to be pursuant to this Minute. The investments and water transfers resulting from the additional projects will be undertaken as described in this Minute.

B. New Water Sources Projects

The Commissioners referred to the recommendations submitted by the Binational Projects Work Group, that a number of other opportunities exist for joint cooperative projects with the potential for increasing delivery or exchange of Colorado River water benefiting both nations, including the following projects:

1. Binational Desalination Plant at the Pacific Ocean coast
2. Binational Desalination Plant in the New River
3. Binational Desalination Plant, Sea of Cortez
4. Reuse of the effluent from the Mexicali Valley wastewater treatment plants in wetlands or riparian restoration of the Colorado River
5. Re-use in the United States of South Bay International Wastewater Treatment Plant effluent

The Commissioners considered that the study and implementation of these projects will require the specific agreement of the two governments by means of a Commission Minute. Accordingly, the Commissioners recommended that the Binational Projects Work Group continue to evaluate all pertinent aspects for each project including the volume of water to be generated, its cost and distribution between the two countries, its potential for exchange, and the benefits that will be generated for both governments, among other relevant information. When exchanging water of varying quality (desalinated water or surface water), the financial analyses should consider mutually beneficial scenarios for both countries.

The Commissioners observed the interest in forming a Binational Desalination Work Group that would study potential new water sources projects as listed above including the development of a study of water desalination opportunities in the Sea of Cortez, as proposed by the Arizona-Mexico Commission. The group is expected to develop the scope of work for a binational investigation of this item within six months after this Minute enters into force.

In addition, the Commissioners noted Mexico's interest in assessing the feasibility of providing treated effluent to the United States in exchange for investment in potable water and sanitation infrastructure in Tijuana, Baja California, or wherever Mexico considers appropriate, in a manner that benefits both countries.

The Commissioners also observed the appropriateness of analyzing the possibility of discharging through the South Bay Ocean Outfall the treated wastewater originating from the Mexican system in excess of the 25 million gallons per day (1,100 liters per second) stipulated in Minute 283, "Conceptual Plan for the International Solution to the Border Sanitation Problem in San Diego, California/Tijuana, Baja California," signed July 2, 1990.

C. Direct Delivery or Water Exchange

The Commissioners referred to the results presented by the Binational Work Groups, in particular the Binational Projects Work Group, which indicated potential for conserving water or generating new water sources through joint construction projects. They observed that part of these volumes could be provided to users in the United States through direct delivery or through an exchange for water allotted under the 1944 Water Treaty. The Commissioners considered that while both mechanisms could be viable, any direct deliveries to the United States may require a separate Minute of the Commission.

X. ALL-AMERICAN CANAL

The Commissioners noted the efforts of the binational All-American Canal Turnout Project Work Group to examine the processes and timelines necessary to construct, operate and maintain a binational connection between the All-American Canal in the United States and Mexico's Colorado River Tijuana Aqueduct Pump Station PBO. That connection, or a similar adjacent connection, could serve to provide binational deliveries of water if a naturally-occurring event or other mutually acceptable conditions were to cause conveyance interruptions either within the United States or Mexico. The Commissioners observed that the availability of flows, final design elements, proportional operation and maintenance costs, and corresponding legal reviews and compliance, among other relevant matters, still need to be resolved. Consultation within each country will be necessary to ensure binational deliveries would not harm users in either country. The Commissioners determined that a separate Minute of the Commission would be necessary to address all matters relating to the design, construction, operation and maintenance of a binational connection.

RESOLUTIONS

Based on the above, the Commissioners submit the following resolutions for the approval of both governments:

1. Distribution of flows under high elevation reservoir conditions will be carried out in accordance with the provisions of this Minute, particularly Section II.
2. Distribution of flows under low elevation reservoir conditions will be carried out in accordance with the provisions of this Minute, particularly Section III.
3. The Binational Water Scarcity Contingency Plan will be carried out in accordance with the provisions of this Minute, particularly Section IV.
4. Creation and delivery of Mexico's Water Reserve volumes will be carried out in accordance with the provisions of this Minute, particularly Section V.

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5. Operations, actions, and cooperative efforts to address salinity will be carried out in accordance with the provisions of this Minute, particularly Section VI.
6. Actions related to variability of flows arriving in Mexico will be carried out in accordance with the provisions of this Minute, particularly Section VII.
7. Actions and funding related to the environment will be carried out in accordance with the provisions of this Minute, particularly Section VIII.
8. Investments in projects and associated water exchanges will be carried out in accordance with the provisions of this Minute, particularly Section IX.
9. Actions related to the All-American Canal will be carried out in accordance with the provisions of this Minute, particularly Section X.
10. The limitations as to the rates of deliveries specified in Article 15 of the 1944 Water Treaty continue to apply.
11. The United States will be deemed to have fulfilled its delivery obligations to Mexico under the 1944 Water Treaty during the term of this Minute, notwithstanding any reduction or adjustment of delivery schedules to Mexico pursuant to this Minute.
12. The interim measures agreed to in Resolutions 1-9 of this Minute will apply through December 31, 2026.
13. The provisions of this Minute will not be regarded as a precedent for developing further necessary implementing agreements within the United States, nor for future delivery of Colorado River water allotted to Mexico annually under Article 10 of the 1944 Water Treaty, nor for future salinity management via the mechanism described in Resolution 5 above.
14. The provisions of this Minute do not affect the interpretation or application of the provisions of Article 10(b) of the 1944 Water Treaty, including reduction of water allotted to Mexico under Article 10(a) of said treaty.
15. All activities undertaken pursuant to this Minute will be subject to the availability of funds, resources, and corresponding personnel, as well as to applicable laws and regulations in each country.
16. This Minute will supersede Minute 319 except that those provisions of Section III.6 WATER FOR THE ENVIRONMENT AND ICMA/ICS EXCHANGE PILOT PROGRAM that

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are not inconsistent with this Minute will remain in force through December 31, 2017.

17. This Minute will enter into force upon notification of approval by the Government of the United States of America and the Government of the United Mexican States through the respective Section of the Commission.

The meeting was adjourned.



Edward Drusina
U.S. Commissioner



Roberto F. Salmón Castelo
Mexican Commissioner



Sally E. Spener
U.S. Section Secretary



José de Jesús Luévano Grano
Mexican Section Secretary