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In Good Times and In Bad: An International Water Law Analysis of Minute 323

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Abstract

As the latest agreement between the United States and Mexico on use of the Colorado River, Minute 323 grapples with the challenges of increasing water scarcity in the region. As transboundary river basins across the globe face similar crises, Minute 323 will serve as an imperfect model for responding to scarcity reasonably, equitably, and sustainably.

Minute 323 addresses scarcity from several angles. The agreement creates a detailed plan for changes to Mexico's allocation during times of surplus and drought. It allows Mexico the flexibility to temporarily store waters in Lake Mead in the United States before withdrawing them later. It establishes measures to address Mexico's concerns over the salinity and flow variability of its allocation. In collaboration with a coalition of environmental nongovernmental organizations, the United States and Mexico committed to funding and providing water to replenish the Colorado River Delta. The United States also agreed to provide Mexico with $31.5 million for water conservation and infrastructure projects.

Transboundary water law provides an analytical framework for evaluating both the substantive and procedural features of Minute 323. Applying the principle of equitable and reasonable utilization shows Minute 323's strengths and weaknesses. The shortage- and surplus-sharing mechanisms equitably allocate the benefits and burdens of climatic and hydrological conditions. The agreement's reliance on diverse stakeholders is a procedural commitment to equitable and reasonable utilization. The market-like features provide incentives for efficiency, though the limits on transferability and market participation hinder optimal allocation. Minute 323 does not prevent temporary reductions in Mexico's allocation from conflicting with the human right to water.

Minute 323 reflects another key principle of international environmental law: the obligation not to cause significant harm to other states. The principle

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overlaps with equitable and reasonable utilization to establish that harm, though not absolutely banned, must be shared equitably. The salinity-control measures in Minute 323 prevent and mitigate potential health risks and economic harms in Mexico by establishing methods to limit and monitor salinity levels.

The obligation to protect international watercourses has emerged more recently, but it has become a fixture of international water law. Minute 323's salinity-mitigation measures align with a traditional conception of the principle. The express allocation of water for the environment breaks new ground as proactive commitment to the ecological health of an international river basin.

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I. THE PATH OF COOPERATION

The Colorado River is not the longest or biggest river in North America, but it is "the most legislated, most debated, and most litigated river in the entire

world."[1] The river forms the geological, economic, and political epicenter of the "greatest hydraulic society ever built in history,"[2] yet one that is widely considered unsustainable.[3] The Colorado River provides water to nearly forty million people and irrigates 5.5 million acres of land, supporting significant portions of nine U.S. and Mexican states and twenty-two federally-recognized Indian tribes.[4] Since 2000, the Colorado River Basin has been suffering a historic drought, experiencing its lowest sixteen-year period of inflow in over 100 years of record keeping.[5] Reservoir storage has declined from nearly full to about half of capacity,[6] a level close to triggering severe cutbacks in water allocations among the basin states.[7]

Minute 323 is the latest binational response to the increasing water scarcity in the Colorado River Basin. On September 21, 2017, officials from Mexico, the United States, and the International Boundary & Water Commission ("IBWC") reached a new agreement, adding to the Colorado River's voluminous body of law: Minute 323, "Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado River Basin."[8] An updated implementation plan for a 1944 treaty between the United States and Mexico, Minute 323 clarifies terms for sharing shortages, invests in environmental and infrastructure projects in Mexico, and allows Mexico greater flexibility in drawing on its allotment.[9]

Mexican Commissioner Roberto Salmon said, "This agreement provides certainty for water operations in both countries and mainly establishes a planning tool that allows Mexico to define the most suitable actions for managing its Colorado River waters allotted by the 1944 Water Treaty."[10] U.S. Commissioner Edward Drusina added, "This agreement puts us on a path of cooperation rather

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1. MARC REISNER, CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER 125 (1st ed. 1986).

2. Jonathan S. King et. al., *Getting to the Right Side of the River: Lessons for Binational Cooperation on the Road to Minute 319*, 18 U. DENV. WATER L. REV. 36, 38 (2014) (citing DONALD WORSTER, RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST 276 (1985)).

3. STEPHEN MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES 14 (2d ed. 2007).

4. King, *supra* note 2, at 38.

5. DROUGHT IN THE COLORADO RIVER BASIN, DEP'T. OF INTERIOR, https://www.doi.gov/water/owdi.cr.drought/en/ (last visited Nov. 17, 2017).

6. *Id.*

7. RECORD OF DECISION, COLORADO RIVER INTERIM GUIDELINES FOR LOWER BASIN SHORTAGES AND THE COORDINATED OPERATIONS FOR LAKE POWELL AND LAKE MEAD, DEP'T. OF INTERIOR 1 (Dec. 13, 2007), https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf [hereinafter 2007 Guidelines].

8. Int'l Boundary & Water Comm'n, *United States and Mexico Conclude Colorado River Agreement*, at 1 (Sept. 27, 2017), https://ibwc.gov/Files/Press_Release_092717.pdf [hereinafter IBWC Press Release].

9. Int'l Boundary & Water Comn'n, *Minute 323: Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado River Basin* (Sept. 21, 2017), https://www.ibwc.gov/Files/Minutes/Min323.pdf [hereinafter Minute 323].

10. IBWC Press Release, *supra* note 8, at 3.

than conflict as we work with Mexico to address the Colorado River Basin's many challenges."[11] Commissioner Drusina argued that the deal is "not necessarily the complete fix" to the basin's long-term scarcity risk but is a "monumental achievement in collaboration."[12]

Fresh water scarcity is one of the great crises of the twenty-first century.[13] Some experts predict that the increasingly acute scarcity may lead to severe social and political upheaval.[14] The United States and Mexico have responded to substantial scarcity in the Colorado River Basin with Minute 323 despite challenging circumstances. The relationship between the two countries has often been riddled with conflict, particularly following the election of Donald Trump,[15] and the economic significance of the Colorado River waters made for incredibly high-stakes negotiations. Overcoming a rocky relationship to address a difficult, costly crisis, Minute 323 serves as a good, though imperfect, model for other transboundary river agreements as countries around the world address scarcity. To evaluate the usefulness of Minute 323 as a model for cooperation in a water-scarce world, this paper will explore its procedural history, discuss key provisions, and analyze the agreement based on principles of international water law.

A. THE COMPACT AND THE TREATIES

Minute 323 follows a long history of cooperation between the United States and Mexico. The IBWC traces its roots as far back as the 1848 Treaty of Guadalupe-Hidalgo and the Gadsden Treaty of 1853, which established temporary joint commissions to determine the U.S.–Mexico boundary.[16] The United States and Mexico established the International Boundary Commission ("IBC") on March 1, 1889, to resolve boundary and jurisdictional questions.

In 1922, the seven basin states[17] in the U.S. allocated water rights with the

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11. *Id.* at 2–3.

12. Brandon Loomis, *U.S. and Mexico Agree to Share in Colorado River Conservation and Possible Shortage*, ARIZ. REPUBLIC (Sept. 27, 2017), http://www.azcentral.com/story/news/local/arizona-environment/2017/09/27/u-s-and-mexico-agree-share-colorado-river-conservation-and-possible-shortage/710649001/.

13. EDITH BROWN WEISS, INTERNATIONAL LAW IN A WATER-SCARCE WORLD 51 (The Hague: Martinus Nijhoff, 2013).

14. *See, e.g.*, NAT'L INTELLIGENCE COUNCIL, GLOBAL WATER SECURITY: INTELLIGENCE COMMUNITY ASSESSMENT (Feb. 2012), https://www.dni.gov/files/documents/Special%20Report_ICA%20Global%20Water%20Security.pdf.

15. Tracy Wilkinson & Brian Bennett, *Trump Has First Meeting with Mexico's Peña Nieto Amid Tense Relations*, L.A. TIMES (July 7, 2017), http://www.latimes.com/politics/washington/la-na-essential-washington-updates-trump-has-1st-meeting-with-mexico-s-1499425322-htmlstory.html.

16. *History of the International Water and Boundary Commission*, INT'L BOUNDARY & WATER COMM'N, https://ibwc.gov/About_Us/history.html (last visited Nov. 17, 2017).

17. The Compact states are Colorado, Utah, New Mexico, Arizona, Nevada, and California. The first four states represent the "Upper Basin" and the last three form the "Lower Basin." Arizona is part of

Colorado River Compact ("the Compact").[18] When negotiating the Compact, the states relied on inordinately high flow estimates to determine allotments.[19] The years preceding the Compact had been some of the wettest on record. As recently as 1907, the Colorado River sent a record twenty-five million acre-feet to the Gulf of California.[20] Compact negotiators assumed the basin would produce around nineteen million acre-feet annually.[21] The initial agreement allotted a total of sixteen million acre-feet per year among the U.S. basin states, and although not a party, the negotiators reserved Mexico 1.5 million acre-feet per year.[22] These figures substantially overestimate the Colorado River's average flow over the past century. The Bureau of Reclamation has reported flows averaging 14.8 million acre-feet per year from 1906 to 2015.[23]

The United States and Mexico relied upon similarly inaccurate presumptions when they came to a formal agreement on boundary water allocation.[24] Though the United States and Mexico likely carried out intermittent discussions regarding the diversion of Colorado River waters in the early twentieth century,[25] it was not until February 3, 1944, that the two countries "ended nearly a half century of controversy by agreeing to divide the waters of the Colorado River."[26] The U.S.–Mexico treaty on the "Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande" ("1944 Treaty") guaranteed Mexico an annual allocation between 1.5 million and 1.7 million acre-feet.[27] During the treaty deliberations, the State Department shared with Mexico a memorandum estimating that the Colorado's average annual flow was eighteen million acre-feet.[28] The treaty also provided for binational shortage-sharing: in the event of "extraordinary drought," Mexico's allotment will be reduced "in the same proportion as consumptive uses in the United States are reduced."[29]

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both groups. *See* Colorado River Compact, 1923 Colo. Sess. Laws 684, COLO. REV. STAT. § 37-61-101, art. II (2016) [hereinafter Compact].

18. Charles J. Meyers & Richard L. Noble, *The Colorado River: The Treaty with Mexico*, 19 STAN. L. REV. 367, 379 (1967).

19. Jason Anthony Robison, *The Colorado River Revisited*, 88 U. COLO. L. REV. 475, 513 (2017).

20. REISNER, *supra* note 1, 128–29.

21. Meyers & Noble, *supra* note 18, at 379.

22. REISNER, *supra* note 1, at 130; Meyers & Noble, *supra* note 18, at 378–80.

23. Robison, *supra* note 19, at 513.

24. Meyers & Noble, *supra* note 18, at 378–80.

25. *Id*. at 367.

26. Norris Hundley, Jr., *The War Against the West Itself: The Colorado River: Major Issues for the Next Century*, *in* NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 12, 25 (Gary D. Weatherford & F. Lee Brown eds., 1986).

27. Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Treaty between the United States of America and Mexico, U.S.-Mex., art. 10, Feb. 3, 1944, T.S. 994 [hereinafter 1944 Treaty].

28. Meyers & Noble, *supra* note 18, at 379 (citing *Memorandum from the Department of State to the Mexican Embassy*, [1942] 6 FOREIGN REL. U.S. 561 (1963)).

29. 1944 Treaty, *supra* note 27, art. 10(b).

The 1944 Treaty also converted the original IBC to the modern-day IBWC and expanded the organization's role, authorizing it to build and manage waterworks; resolve problems and negotiate further agreements regarding international waters; and settle treaty interpretation disputes, subject to each country's approval.[30] The IBWC's decisions, called "Minutes," are international agreements issued pursuant to its Treaty authority.[31] Minutes have the status of executive agreements and are considered approved by each country unless either government disapproves within thirty days.[32]

B. A FEW MINUTES BEFORE

Minutes have proven an effective, if limited, tool for addressing new problems within IBWC's authority, and several Minutes played a key role in the build-up to Minute 323. In 1974, the IBWC finalized Minute 242, resolving disputes over the increasing salinity of Mexico's allotment, as the 1944 Treaty did not address water quality.[33] Through Minute 242, the United States agreed to monitor and limit salinity levels and to finance projects for the purposes of revitalizing the damaged Mexicali Valley and ensuring acceptable salinity levels.[34]

Minute 306 responded to increasing environmental concerns about the Colorado River Delta (the "Delta") in 2000.[35] Before the construction of numerous dams, the Colorado River fed a delta that supported a vibrant array of plant, bird, and marine life covering over nineteen million acres.[36] Decades of dam building deprived the Delta of almost all freshwater flow, damaging the unique ecosystem.[37] Once Lake Mead was filled in 1981, flood flows began to reach the Delta, inadvertently leading the wetlands and riparian vegetation to flourish once again.[38] The Delta's rehabilitation caught the attention of environmental nongovernmental organizations ("NGOs"), who pressured the IBWC to support the burgeoning Delta ecosystem.[39] The IBWC issued Minute 306, which established a "framework for cooperation" through joint studies on Delta restoration.[40] Issues

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30. *Id*. art. 24; King, *supra* note 2, at 58.

31. *See* International Boundary & Water Comm'n, U.S. Sec., Strategic Plan: FY 2011–FY 2016, at 14, https://www.ibwc.gov/Files/Strategic_Plan.pdf.

32. 1944 Treaty, *supra* note 27, art. 25.

33. Allie Alexis Umoff, *An Analysis of the 1944 Treaty: Its Past, Present and Future*, 32 ENVIRONS ENVTL. L. & POL'Y, 69, 78 (2008); Int'l Boundary & Water Comn'n, *Minute 242: Recommendation for extension of the Wellton-Mohawk Bypass Drain in Mexican Territory* (June 10, 1975) [hereinafter Minute 242].

34. Umoff, *supra* note 33, at 78; Minute 242, *supra* note 33.

35. King, *supra* note 2, at 70.

36. Jennifer Pitt et al., *Two Nations, One River: Managing Ecosystem Conservation in the Colorado River Delta*, 40 NAT. RESOURCES J. 819, 820 (2000).

37. *Id*. at 820–21.

38. *Id*. at 821.

39. King, *supra* note 2, at 70.

40. Int'l Boundary & Water Comm'n, *Minute 306: Conceptual Framework for U.S.-Mexico Studies for Future Recommendations Concerning the Riparian and Estuarine Ecology of the Limitrophe Section*

of interest "include possible approaches to ensure use of water for ecological purposes."[41]

A breakthrough series of Minutes issued from 2009 to 2012 laid the foundation for Minute 323. Minute 316 sought to mitigate potential impacts from the Yuma Desalination Plant in Arizona on the Ciénega de Santa Clara wetland in Mexico.[42] The agreement allocated water to the Delta in a joint effort from the United States, Mexico, U.S. water users, and a collective of environmental NGOs.[43]

Minute 317 formalized the IBWC's commitment to both the Delta ecosystem and a process driven by stakeholders, instead of one conducted entirely by official U.S. and Mexican diplomats.[44] The agreement created a "conceptual and practical framework" for cooperation that sought input from IBWC officials and representatives of the United States, Mexico, the basin states, and environmental NGOs.[45] The deliberative, multi-tiered process would "explore opportunities for binational cooperative projects" that minimize the impacts of shortages, generate new water sources, and conserve water.[46]

Minute 318 responded to a devastating earthquake that damaged water infrastructure in the Mexicali Valley in 2010.[47] The agreement permitted Mexico to reduce its annual allotment to "only those volumes of water that Mexico can utilize," due to its damaged infrastructure, for three years.[48] Beginning in 2014, Mexico would receive those allotments, "subject to reconsideration depending on the progress of Mexico's reconstruction efforts."[49]

The most important IBWC precedent was 2012's Minute 319, "Interim International Cooperative Measures in the Colorado River Basin Through 2017 and Extension of Minute 318 Cooperative Measures to Address the Continued

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of the Colorado River and its Associated Delta (Dec. 12, 2000), https://www.ibwc.gov/Files/Minutes/Min306.pdf.

41. *Id*. at 3.

42. Int'l Boundary & Water Comm'n, *Minute 316: Utilization of the Wellton-Mohawk Bypass Drain and Necessary Infrastructure in the United States for the Conveyance of Water by Mexico and Non-Governmental Organizations for Both Countries to the Santa Clara Wetland During the Yuma Desalting Plant Pilot Run* (April 16, 2010), https://www.ibwc.gov/Files/Minutes/Minute_316_w_JR.pdf [hereinafter Minute 316].

43. *Id*.; King, *supra* note 2, at 87.

44. *Id*.

45. Int'l Boundary & Water Comm'n, *Minute 317: Conceptual Framework for U.S.-Mexico Discussions on Colorado River Cooperative Actions* (June 17, 2010), https://www.ibwc.gov/Files/Minutes/Minute_317.pdf.

46. *Id*. at 3.

47. Int'l Boundary & Water Comm'n, *Minute 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*, (Dec. 17, 2010), https://www.ibwc.gov/Files/Minutes/Min_318.pdf (Dec. 17, 2010) [hereinafter Minute 318].

48. *Id*. at 2.

49. *Id*. at 4.

Effects of the April 2010 Earthquake in the Mexicali Valley, Baja California."[50] Minute 319 culled together features from prior decisions in creating a five-year pilot program to comprehensively address increasing scarcity in the Basin. Minute 323 adopted and expanded most of the substantive provisions: shortage and surplus sharing,[51] a water-banking program called the Intentionally Created Mexican Allocation ("ICMA"),[52] salinity-mitigation measures,[53] a "Water for the Environment" program,[54] and recommendations to study mutually beneficial infrastructure projects.[55] Minute 319 serves as the primary source of Minute 323's significant innovations. The agreement has been well-received as a model of outcome-oriented cooperation[56] that "expanded the scope of those benefitting"[57] from binational river basin decisions.

II. OVERVIEW OF MINUTE 323'S SUBSTANTIVE PROVISIONS

A. SHARING SHORTAGE AND SURPLUS

In 2007, the Department of Interior promulgated the "Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead" ("2007 Guidelines").[58] Initially proposed by the seven basin states,[59] the 2007 Guidelines specified changes in water allocations to the Lower Basin states based on the water level of Lake Mead, which serves as the primary storage site for the Lower Basin states and Mexico.[60] States would share surplus and, more importantly during the historic drought, shortage.[61] Cutbacks to Lower Basin states begin when the water elevation at Lake Mead dips below 1,075 feet mean sea level ("msl") and become more severe at 1,050 feet msl and 1,025 feet msl.[62] Elevation levels are based on the Secretary of Interior's

50. Int'l Boundary & Water Comm'n, *Minute 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*, (Nov. 20, 2012), https://www.ibwc.gov/Files/Minutes/Minute_319.pdf.

51. *Id.* § III.2.

52. *Id.* § III.4.

53. *Id.* § III.5.

54. *Id.* § III.6.

55. *Id.* § III.7.

56. A. Dan Tarlock, *Toward a More Robust International Water Law of Cooperation to Address Droughts and Ecosystem Conservation*, 28 GEO. ENVTL. L. REV. 261, 284–85 (2016).

57. Michael L. Connor, *Expanding the Watershed: Certainty and Sustainability in the Twenty-First Century, Second Annual Getches-Wilkinson Center for Natural Resources Energy & Environment Distinguished Lecture Series, University of Colorado Law*, 26 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 277, 288 (2015).

58. 2007 Guidelines, *supra* note 7.

59. Douglas L Grant, *Collaborative Solutions to Colorado River Water Shortages: The Basin States' Proposal and Beyond*, 8 NEV. L.J. 964, 964–65 (2008).

60. 2007 Guidelines, *supra* note 7, at 36–37.

61. *Id.*

62. *Id.*

projections for January 1, as determined by the August "24-Month Study" of reservoir conditions.[63]

Minute 323 applies the principles of shared shortage and surplus by creating additions and reductions to Mexico's allotment in proportion to Lower Basin states' reductions outlined in the 2007 Guidelines. In the event of "extraordinary drought," the 1944 Treaty calls for Mexico's allocation to be reduced "in the same proportion as consumptive uses in the United States are reduced."[64] During years of surplus, the United States "undertakes to deliver to Mexico . . . additional waters" not to exceed 1.7 million acre-feet.[65]

Using the same Lake Mead elevation triggers, Minute 323 specifies the precise reductions and increases to Mexico's annual allocation. In times of high elevation (projections above 1,145 feet msl), Mexico will receive additional quantities ranging from 40,000 to 200,000 acre-feet.[66] In times of low elevation (below 1,075 feet msl), Mexico's allotment will decrease between 50,000 acre-feet and 125,000 acre-feet.[67]

B. BINATIONAL WATER SCARCITY CONTINGENCY PLAN

Recognizing that the binational mandatory reductions are "not sufficient to reduce the risk of temporary or prolonged interruptions in water supplies," Minute 323 created the Binational Water Scarcity Contingency Plan "to avoid reaching critical reservoir elevations at Lake Mead."[68] Various water level projections, from 1,090 feet to less than 1,025 feet msl, automatically trigger water savings for both the United States and Mexico.[69] Distinct from the obligatory reductions, savings under this program are recoverable. Subject to several limitations, including evaporation losses and the 1944 Treaty-imposed maximum delivery of 1.7 million acre-feet, Mexico may recover its water savings when reservoir elevations in Lake Mead are projected to exceed 1,110 feet msl by January 1.[70]

C. MEXICO'S WATER RESERVE

Section V of Minute 323 offers Mexico an assortment of options to defer delivery of its annual apportionment. The first is "Emergency Storage."[71] The provision cross-references Minute 318, which allowed deferred delivery following the 2010 Mexicali earthquake, when irrigation infrastructure and farmland were

63. *Id*.
64. 1944 Treaty, *supra* note 27, art. 10(b).
65. *Id*.
66. Minute 323, *supra* note 9, § II.A.
67. *Id*. § III.
68. *Id*. § IV.
69. *Id*.
70. *Id*.
71. *Id*. § V.A.

severely damaged.[72] The provision establishes a tool "similar to the deferral mechanism established in Minute No. 318," allowing Mexico to defer the delivery of up to 260,000 acre-feet (until the Minute expires on December 31, 2026) "to address potential emergencies."[73]

Minute 323 next creates a "Revolving Account for Mexican waters in storage in the United States." The Revolving Account includes any water deferred under Minutes 318 and 319 due to the Mexicali earthquake.[74] The parties likewise agreed to extend the Intentionally Created Mexican Allocation ("ICMA"), allowing Mexico to voluntarily defer delivery if it is engaging in "water conservation projects or new water sources projects."[75] ICMA, the Revolving Account, and Emergency Storage collectively form "Mexico's Water Reserve."[76]

Waters saved as part of the Binational Water Scarcity Contingency Plan are not part of Mexico's Water Reserve, subjecting them to different restrictions.[77] Some notable restrictions for the delivery and storage of Mexico's Water Reserve include the following: Mexico may use the water for any purpose;[78] the maximum volume Mexico may create annually is 250,000 acre-feet;[79] the maximum volume deliverable per year is 200,000 acre-feet;[80] a 3% evaporation reduction will be applied annually;[81] 2% of the water will be reserved for environmental purposes in Mexico;[82] and Mexico may accumulate a maximum balance of 1.5 million acre-feet.[83]

D. SALINITY CONTROL

The creation and delivery of Mexico's Water Reserve and recoverable water savings may present novel salinity problems, which the Minute addresses in Section VI.[84] Both reaffirming and building off Minute 242, the IBWC established several mitigation-control measures. A Binational Salinity Work Group will calculate an acceptable "salinity differential," the difference in salinity levels between the waters in the United States, as measured at the Imperial Dam near Yuma, Arizona, and the waters delivered to Mexico upstream of the Morelos Dam.[85] Mexico is permitted to continue use of the Wellton-Mohawk bypass

72. Minute 319, *supra* note 50, § III.1; *see also* Minute 318, *supra* note 47.
73. Minute 323, *supra* note 9, § V.A; Minute 318, *supra* note 47.
74. Minute 323, *supra* note 9, § V.B.
75. *Id*. § V.C.
76. *Id*. § V.D.
77. *Id*. § V.D.
78. *Id*. § V.E.1.
79. *Id*. § V.E.2.
80. *Id*. § V.E.3.
81. *Id*. § V.E.5.
82. *Id*. § V.E.6.
83. *Id*. § V.E.16.
84. *Id*. § VI.
85. *Id*. § VI.A.1; Minute 242, *supra* note 33.

drain.[86] Water passing through the Wellton-Mohawk Irrigation District in Yuma becomes highly saline, and the bypass system redirects these higher-salinity flows to the Delta, thereby aiding the restoration of the Delta ecosystem and reducing salinity levels in the rest of Mexico's delivered water.[87] The United States agreed to fund the removal of sediment from, and Mexico agreed to maintain, the Sanchez Mejorada Canal,[88] which serves a similar function in diverting higher-salinity flows. The parties also agreed to modernize their salinity monitoring operations.[89]

E. VARIABILITY OF FLOWS

The Commission sought to resolve Mexico's concern about excessive variability of its daily flow.[90] In the short term, the IBWC committed to studying the issue, utilizing existing storage capacity at Mexico's Morelos Dam, and scheduling deliveries at midnight.[91] It also established a goal of controlling variability within 3% of Mexico's daily request and to limit charges to no more than two cubic meters per second.[92] In the "medium term," an IBWC working group would explore additional storage options in Mexico and recommend operational improvements in the border-area delivery system.[93] The United States agreed to modernize operational technologies at the Northerly and Southerly International Borders.[94] Both countries formally recognized the need to increase storage in Mexico in the long term.[95]

F. WATER FOR THE ENVIRONMENT

Section VIII, simply titled "Environment," devises an operational framework to enhance the riparian and estuarine ecology of the Colorado River Limitrophe and Delta.[96] Citing experience gained from the foundational work of Minutes 306 and 319, IBWC's Binational Environmental Work Group set goals of providing 45,000 acre-feet of water for the environment per year and up to forty million dollars over the term of the Minute.[97]

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86. Minute 323, *supra* note 9, § VI.A.2.
87. King, *supra* note 2, at 63, 69.
88. Minute 323, *supra* note 9, § VI.B; *Water Resources Research Center, Desalination Opportunities Lead to Binational Cooperation*, UNIV. OF ARIZ., https://wrrc.arizona.edu/awr/s11/binational (last visited Nov. 17, 2017).
89. Minute 323, *supra* note 9, at § VI.C.
90. *Id.* § VII.
91. *Id.* § VII.A.1.
92. *Id.* § VII.A.3.
93. *Id.* § VII.B.1.
94. *Id.* § VII.B.2.
95. *Id.* § VII.C.
96. *Id.* § VIII.
97. *Id.*

To achieve these goals, the United States and Mexico will coordinate with a binational coalition of NGOs,[98] called Raise the River.[99] The United States, Mexico, and Raise the River will each contribute an equal share of 210,000 acre-feet of water for environmental purposes, nine million dollars for scientific research, and nine million dollars for restoration projects. The Binational Environmental Work Group, featuring federal and state representatives from the United States and Mexico as well as representatives from Raise the River, will implement the program, creating binational criteria for restoration projects and submitting proposals to the IBWC for approval.[100]

G. INVESTMENTS AND PROJECTS

The United States agreed to contribute $31.5 million in water conservation projects expected to generate savings of more than 200,000 acre-feet of water.[101] Such projects may include canal lining, on-farm conservation, regulating reservoirs, fallowing, modernization and technical improvements to irrigation districts, system operational improvements, the creation of wetlands, and wastewater effluent reuse.[102] The water savings will be distributed to the United States, Mexico, and the Section VIII environmental projects, with an additional 50,000 acre-feet reserved "for the system to benefit all users."[103] By December 31, 2017, Mexico must transfer 124,000 acre-feet to the United States from its Water Reserve.[104] The IBWC's Binational Projects Work Group will oversee the projects, facilitating coordination between the IBWC Commissioners and the project's funders, including water agencies, Bureau of Reclamation, and Raise the River.[105] The Work Group will also evaluate prospective projects with the potential of increasing delivery and exchange of Colorado River water.[106]

H. ALL-AMERICAN CANAL

The Minute briefly noted studies exploring a binational connection between the All-American Canal in the United States and Mexico's Colorado River Tijuana Aqueduct Pump Station PBO.[107] The connection would allow for consistent binational delivery, despite conveyance interruptions either within the United States or Mexico.[108] Acknowledging the project's merits, the "Commissioners

98. *Id*.
99. RAISE THE RIVER, raisetheriver.org/ (last visited Nov. 17, 2017).
100. Minute 323, *supra* note 9, § VIII.C.
101. *Id*. § IX.A; RAISE THE RIVER, *supra* note 99.
102. Minute 323, *supra* note 9, § IX.A.
103. *Id*. § IX.A.
104. Minute 323, supra note 9, § IX.A; Minute 319, *supra* note 50, § III.6.e.iii.
105. Minute 323, *supra* note 9, § IX.A.
106. *Id*. § IX.B.
107. *Id*. § X.
108. *Id*.

determined that a separate Minute" would be necessary to adequately address the topic.[109]

III. INTERNATIONAL WATER LAW ANALYSIS OF MINUTE 323

Three concepts of transboundary water law are helpful to understand both the innovations and shortcomings of Minute 323: the principle of reasonable and equitable utilization, the duty to prevent significant harm to other states, and the burgeoning obligation to protect international watercourses.

A. REASONABLE AND EQUITABLE UTILIZATION

Derived from United States Supreme Court decisions, reasonable and equitable utilization has become "the fundamental rule governing the use of international watercourses."[110] The principle served a foundational role in the International Law Association's 1966 Helsinki Rules[111] on international rivers and was confirmed in 1997 by the International Court of Justice in the *Case concerning the Gabcíkovo-Nagymaros Project (Hungary/Slovakia)*.[112] The 1997 United Nations "Convention on the Law of the Non-navigational Uses of International Watercourses" ("U.N. Watercourses Convention") declares, "Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner."[113] They must do so "with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse."[114] Though not yet in force, the U.N. Watercourses Convention is "widely regarded by academic scholars as codifying the fundamental rules of customary international water law" and equitable and reasonable utilization is one of its "primary principles."[115]

1. Reductions and Savings

The 1922 Compact went against the contextual tide of prior appropriation in the American West "to provide for the equitable division and apportionment of

109. *Id.*

110. MCCAFFREY, *supra* note 3, at 384, 404.

111. Int'l Law Ass'n, Helsinki Rules on the Uses of the Waters of International Rivers and Comments, *Report of the Fifty-Second Conference* 484, art. IV (1966).

112. Gabcikovo-Nagymaros Project, Judgement, 1997 I.C.J. 7, ¶¶ 78, 85, 147, 150 (Sept. 25, 1997); MCCAFFREY, *supra* note 3, at 384–85.

113. G.A. Res. 51/229, art. 5.1, Convention on the Law of the Non-Navigational Uses of International Watercourses (May 21, 1997) [hereinafter UN Convention].

114. *Id.*

115. Sharmila L. Murthy, *Iraq's Constitutional Mandate to Justly Distribute Water: The Implications of Federalism, Islam, International Law and Human Rights*, 42 GEO. WASH. INT'L L. REV. 749, 774 (2010).

the use of the waters of the Colorado System."[116] The 1944 Treaty entitled Mexico to its apportionment of 1.5 million acre-feet per year, but the parties did not expressly consider the factors of equitable and reasonable utilization as set out in Article 6 of the U.N. Watercourses Convention.[117] Instead, negotiators were reluctant to encourage inquiry into uses on either side of the border.[118] Royce Tipton, an engineer for the American Section of the International Boundary Commission who was active in Treaty negotiations, stated, "We have no business looking over the border to see what Mexico does with the water."[119]

Regardless of whether 1.5 million acre-feet would be an equitable apportionment under more rigorous scrutiny, Minute 323 equitably shares the burdens of drought and benefits of surplus between the two countries. The proportional sharing of the burdens and benefits of climactic conditions is consistent with the U.N. Watercourses Convention, which calls for consideration of "hydrological, climatic, ecological and other factors of a natural character."[120] Though the 1944 Treaty addressed only the proportional sharing of drought, Minute 323 affirms a reciprocal right to surplus, as well.

The sharing provisions are also equitable in a narrow, mathematical sense. The 2007 Guidelines require the Lower Basin states to accept reductions of 333,000 acre-feet when the Lake Mead water level is projected between 1,050 feet msl and 1,075 feet msl.[121] That reduction represents 4.44% of the Lower Basin allocation and 2.22% of the total United States allocation.[122] Mexico's comparable reduction is 3.33% of its annual allocation, splitting the difference between two reasonable metrics.[123] The figures remain consistent for the next level of reductions: the U.S. reduction represents 5.56% of the Lower Basin allocation and 2.78% of the total allocation, whereas Mexico's reduction is 4.67%. Mexico's proportionate burden increases at Lake Mead's lowest elevation levels to 8.33%, compared with 6.67% for Lower Basin and 3.33% for the United States overall.

The Binational Water Scarcity Contingency Plan furthers the concept of equitable apportionment, particularly "with a view to attaining optimal and sustainable utilization"[124] of the Colorado River. The parties recognized that the shortage-sharing provisions in Section II of the Minute would be inadequate to prevent "interruptions in water supplies that would result in adverse impacts on the society, environment, and economy of the Colorado River system."[125] The proactive plan expressly accounts for multiple U.N. Watercourses Convention

116. Compact, *supra* note 17, art. 1.
117. UN Convention, *supra* note 113, art. 6.
118. Meyers & Noble, *supra* note 18, at 383–86.
119. *Id*. at 385.
120. UN Convention, *supra* note 113, art. 6.1(a).
121. Minute 323, *supra* note 9, § III.
122. *Id*.
123. *Id*.
124. UN Convention, *supra* note 113, art. 5 ¶ 1.
125. Minute 323, *supra* note 9, § IV.

factors: ecological, social and economic need, dependent populations, and existing uses.[126] Future agreements in the Colorado River Basin and transboundary river basins worldwide should emulate Minute 323's shortage-sharing provisions. By fairly dividing the burdens of scarcity with an eye towards long-term, sustainable use, Minute 323 exemplifies the principle of reasonable and equitable utilization in times of water scarcity.

2. Stakeholder-Driven Process

Equitable and reasonable utilization focuses not merely on the outcome but also on the process.[127] It is not an "abstract and static state of affairs" but a dynamic relationship, premised on open communication and, incorporating Article 9 of the U.N. Watercourses Convention, the exchange of scientific information.[128] Minute 323 requires the collection and exchange of scientific information throughout,[129] including a commitment from the United States to fund and implement updates to the monitoring systems for salinity control and border operations, with the goal of sharing real-time data.[130] It also credits several of its achievements, including "Water for the Environment," to the joint studies initiated under past agreements.[131]

One of the most remarkable aspects of Minute 323 may be its commitment to including a broad range of key stakeholders. The innovation of the Section VIII's "Water for the Environment" plan is premised on the inclusion of Raise the River and the binational coalition of NGOs which will share significant coordination and funding responsibilities.[132] Raise the River will even contribute one-third of the water,[133] through water rights the groups acquired in preceding years through its Colorado River Delta Water Trust.[134] The environmental NGOs provided scientific information, project-based expertise, and linguistic and cultural communication skills that helped the IBWC forge the innovative program.[135]

The agreement relied on other stakeholders, as well. The IBWC's working groups feature federal and state representatives from both countries, as well as environmentalists from the NGOs.[136] Minute 323's predecessor, Minute 319,

126. UN Convention, *supra* note 113, art. 6(a)–(e).

127. MCCAFFREY, *supra* note 3, at 401–402.

128. *Id*. at 402; UN Convention, *supra* note 113, art. 9.

129. Minute 323, *supra* note 9, §§ III.E, III.G, VI.A.I, VI.C, VII.A.1, VII.A.3, VII.B.1, VII.B.2, VII.C.

130. *Id*. §§ VI.C, VII.B.2.

131. *Id*. § VIII.

132. *Id*.

133. *Id*. § VIII.B.

134. Brian Clark Howard, *Saving the Colorado River Delta, One Habitat at a Time*, NATL. GEOGRAPHIC (Dec. 15, 2014), https://news.nationalgeographic.com/news/special-features/2014/12/141216-colorado-river-delta-restoration-water-drought-environment/.

135. King, *supra* note 2, at 110.

136. *See, e.g*., Minute 323, *supra* note 9, §§ VIII.C, IX.A.

began as informal discussions with the Bureau of Reclamation, the Basin states, U.S. water agencies, NGOs, the IBWC, La Comisión de Límites y Agua (the Mexican section of IBWC), CONAGUA (the Mexican federal water authority), and other local stakeholders.[137] The coalitions established leading up to Minute 319 continued to serve as a basis for Minute 323, which relied upon input from the groups' varying perspectives.[138] By incorporating localized, technical, and pragmatic expertise, cooperation among diverse stakeholders has paid off in a functional and comprehensive agreement. Additionally, the inclusive process is itself grounded in the principle of reasonable and equitable utilization. Like Minute 323, other scarcity-focused transboundary river basin negotiations should seek to include such broad coalitions to achieve reasonable and equitable utilization both in substance and process.

3. Moving to Market

a. Investments and Projects Exchange as a Market Transaction

The increased flexibility of water use under Minute 323 contributes to the optimal utilization of Mexico's allocation. Efficiency and conservation are factors of reasonable and equitable utilization[139] and are especially critical in times of increasing scarcity. Mexico's Water Reserve allows Mexico to store portions of its entitlement in Lake Mead for future withdrawals.[140] Minute 323's Investment and Projects section facilitated the transfer of 124,000 acre-feet of Mexico's water to the United States, in exchange for $31.5 million.[141] Allowing Mexico greater choice in when and whether to use its full allocation in exchange for pursuing water conservation and infrastructure projects permits Mexico to conserve water when it isn't needed and to use water more efficiently when it is.

These provisions form a limited water market. Water markets recognize transferable rights in water that "facilitate voluntary exchanges and market pricing of water resources."[142] There is increasing recognition in international law that water is, in part, an economic good.[143] The 1992 U.N. Conference on Environment and Development in Rio endorsed the concept: "Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource, and a social and economic good."[144]

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137. King, *supra* note 2, at 89.

138. RAISE THE RIVER, *supra* note 99.

139. MCCAFFREY, *supra* note 3, at 397; UN Convention, *supra* note 113, art. 6(f).

140. Minute 323, *supra* note 9, § V.

141. *Id.* § IX.

142. Jonathan H. Adler, *Warming Up to Water Markets*, 31.4 REG. (Cato Inst., D.C.), Winter 2008–09, at 14–15.

143. ALINE BAILLAT, INTERNATIONAL TRADE IN WATER RIGHTS: THE NEXT STEP 13–14 (2010).

144. U.N. Conference on Environment and Development, Agenda 21, Chapter 18.8 U.N. Doc. A/CONF.151/26/Rev.1 (Vol. 1), annex II (1993); BAILLAT, *supra* note 143, at 14.

Use of the Colorado River's waters is notoriously inefficient, with large allocations supporting water-intensive crops due to inadequate pricing.[145] Water markets promote efficient use by reallocating water to the highest-value use "through voluntary exchange and the generation of information about relative scarcity and demand."[146] If an individual is using a transferable resource inefficiently, there is an opportunity for someone else to gain from acquiring the resource and putting it to better use.[147] Transferability creates incentives for conservation, as rights holders can sell water they conserve to other users.[148]

The Investment and Projects exchange is a step towards the transferability of water rights. The United States valued 124,000 acre-feet of water more than $31.5 million, and for Mexico the inverse is true. The water will go to the highest-valued use between the two parties. Not only has Mexico committed to using the money for infrastructure projects that use water more efficiently, but, to the extent that the transaction sets a repeatable precedent, the new transferability of Mexico's 1944 Treaty allocation promotes conservation: Mexico now has the option to sell a portion of the water it does not use.

There are substantial limitations to the potential efficiency of the exchange. Competitive markets usually include the following characteristics: "(1) a large number of buyers and sellers; (2) products that are fungible, or indistinguishable to consumers; (3) consumers and producers with perfect information about prices and quality; and (4) firms with equal knowledge of and access to relevant technology."[149] Markets without all four characteristics may fail to allocate goods efficiently.[150]

Minute 323's market is far from competitive. The considerable cooperation and information exchange in the decision-making process[151] likely establishes the fourth characteristic: shared knowledge of and access to technology. However, other characteristics of a competitive market are lacking. There are only two countries that participate in the exchange of Colorado River water. Economists have questioned the fungible nature of water in any water market.[152] The exchange was a one-time transfer after years of negotiation, representing substantial transaction costs. The money also comes with significant restrictions, as Mexico may use it only for certain conservation and infrastructure projects.[153] Minute 323 does not establish a mechanism for continued exchanges, and there is

145. APRIL R. SUMMIT, CONTESTED WATERS 214–15 (Univ. Press of Colo., 2013).
146. *Id*.; Adler, *supra* note 142, at 15.
147. Adler, *supra* note 142, at 16.
148. *Id*.
149. Mark Squillace, *Water Transfers and Climate Change*, NAT. RESOURCES J. 55, 68 (Spring 2013) (citing DAVID BESANKO & RONALD R. BRAEUTIGAM, MICROECONOMICS 330 (4th ed. 2011)).
150. *Id*. at 68.
151. *See* Minute 323, *supra* note 9, § III.A.2.
152. Squillace, *supra* note 149, at 69–70.
153. Minute 323, *supra* note 9, § IX.A.

no clear indication that the parties will be able to continue transferring water for money.

Because of the one-off, two-party nature of the transaction, traditional market forces did not determine the water's price. In a competitive market, prices "adjust constantly to all of the supply and demand variables, providing each buyer and seller with up-to-date information on changes in relative values in the world around them."[154] Instead of comprehensive, real-time data, the uncompetitive market means the water price reflects two countries' valuations, which are inherently less informed.[155]

b. Mexico's Water Reserve as Water Banking

Storage under Mexico's Water Reserve is a limited step towards a market-based water banking system. In their simplest form, water banks allow users to store water temporarily and to withdraw it later. Water banks have a long history in the American West, dating back to the early 1930s in Idaho.[156] Before Minute 323, water banking already played an important role in the Colorado River Basin by allowing flexibility in Lower Basin allocations. The Arizona Water Bank allows the Southern Nevada Water Authority ("SNWA") to store part of Nevada's Colorado River water in Arizona's groundwater aquifer in exchange for payments to the state.[157] When SNWA needs its entitlement, it takes water from its regular diversion point on Lake Mead.[158]

Water banks are an institutionalized process to facilitate the transfer of developed waters to new users.[159] They involve two features: (1) a repository or "bank" where parties can store water, and (2) a program for other parties to withdraw water from the bank.[160] Like water markets overall, water banks can provide access to parties with critical needs, especially during dry years, and they can also promote conservation by allowing water rights holders to sell what they do not need.[161] They may involve "paper transactions" in which sellers forego part of their entitlement that a buyer may use.[162] They more commonly rely on physical storage, either in a reservoir or underground.[163] Some water banks charge for the right to store water temporarily and allow the original owner to take the water at some later time.[164]

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154. Adler, *supra* note 142, at 16 (quoting environmental economist Richard Stroup).
155. *Id.*
156. Squillace, *supra* note 149, at 113.
157. *Id.* at 101.
158. *Id.* at 114.
159. *Id.* at 113.
160. *Id.*
161. *Id.*
162. *Id.*
163. *Id.*
164. *Id.* at 113–14.

Mexico's Water Reserve certainly features the first characteristic of a water bank: storage in Lake Mead. The second feature, a withdrawal program for other users, is minimal. Mexico itself has the right to withdraw from its own reserves, subject to the requirements in Section V.[165]

There is no permanent mechanism to sell the water to other users, though the Investments and Projects did in fact provide the United States with water from Mexico's Water Reserve in exchange for project funding.[166]

Though limiting withdrawal to Mexico is a substantial hindrance to efficient water banking, Mexico's Water Reserve provides incentives for greater efficiency and conservation. The temporal flexibility allows Mexico to anticipate when it will find the water more valuable. Over the duration of Minute 323, Mexico has reason to conserve up to 1.5 million acre-feet of water[167] for its most valuable use, whether that is responding to a natural disaster, increasing domestic storage capacity, or developing more efficient irrigation systems. By requiring Mexico to invest in water conservation projects, the Investments and Projects exchange makes it especially likely that Mexico's Water Reserve will go towards more efficient uses.[168]

c. Market Failures and the Human Right to Water

Mexico's Water Reserve and the Investments and Projects Exchange represent a small shift towards a market-based system. Each program could likely achieve more efficient water allocation by embracing features of a competitive market. Yet even in its moderate shift towards the transferability of water rights, Minute 323 does nothing to address one of the most consistent criticisms of water markets: conflict with the principle of water as a human right.[169]

Though not expressly recognized in the 1948 Universal Declaration of Human Rights, the human right to water has gained increasingly widespread acceptance through subsequent legal instruments.[170] In 2002, the United Nations Committee on Economic, Social and Cultural Rights issued a definition of the right in its General Comment 15: "The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses."[171] In 2010, the United Nations General Assembly recognized

165. Minute 323, *supra* note 9, § V.
166. *Id.* § IX.A.
167. *Id.* § V.E.16.
168. *Id.* § IX.A.
169. BAILLAT, *supra* note 143, at 14.
170. Stephen McCaffrey, *The Human Right to Water: A False Promise?*, 47 U. PAC. L. REV. 221, 224–27 (2016).
171. U.N. Comm. on Econ., Soc., and Cultural Rights, General Comment No. 15: The Right to Water (Arts. 11 and 12 of the Covenant), E/C.12/2002/11, (Jan. 20, 2003), *available at* http://www.refworld.org/docid/4538838d11.html.

"the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights."[172]

The U.N. Watercourses Convention provides implicit support for the human right to water. Article 10 states that conflicting uses shall be resolved with reference to Article 5 ("Factors relevant to equitable and reasonable"), Article 7 ("Obligation not to cause significant harm"), and "with special regard being given to the requirements of vital human needs."[173] Though the language falls short of an express recognition of a human right to water, "vital human needs" arguably includes, at a minimum, water for drinking and sanitation.

Minute 323 does not include any language identifying a human right to water. Mexico has agreed to forego a portion of its allocation and has incentive to temporarily defer even more of its water. The qualitative limits on Mexico's ability to contribute to its reserve are primarily that it must invest in water conservation projects and new water sources projects.[174] The quantitative limitations will allow Mexico to contribute a maximum of 250,000 acre-feet per year of its total 1.5 million acre-feet.[175] Roughly 85% of Mexico's allocation goes to agricultural uses in the Mexicali Valley, but the water also serves urban areas like Tijuana, Tecate, and Rosarito.[176] Although it seems likely that farmers will bear the brunt of any foregone allocation, Minute 323 provides no assurance that Mexico will continue to provide water for basic human needs.

The incorporation of market features offers tremendous potential for increasing efficiency, but it also has potential to interfere with the provision of safe and clean water for drinking and sanitation to all. The agreement allows Mexico to forego its allocation in ways that could deprive some individuals of water for their vital human needs. Water scarcity increases the likelihood of conflicting uses, and Article 10 of the U.N. Watercourses Convention declares that parties must reconcile such conflict with special regard for vital human needs.[177] Minute 323 falls short as a model for dealing with water scarcity by neglecting the broadly recognized human right to water. Future transboundary water agreements should take several lessons from Minute 323's tentative steps towards market features: in times of scarcity, efficient water markets can increase efficient use of water, but parties must correct a purely economic approach by guaranteeing water for basic human needs.

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172. G.A. Res. 64/292, Human Right to Water and Sanitation (July 28, 2010).
173. U.N. Convention, *supra* note 113, art. 10(b).
174. Minute 323, *supra* note 9, § V.C.
175. *Id.* § V.E.2.
176. Sandra Dibble, *Baja California Farmers Confront Prospect of Water Shortage*, LA TIMES, July 7, 2015, http://www.latimes.com/local/california/la-me-border-drought-watch-20150707-story.html.
177. U.N. Convention, *supra* note 113, art. 10.

d. Proposals for Improving Minute 323's Market Features

Although creating a more efficient market would likely require a wholesale amendment to the 1944 Treaty, there are several tools that could correct the shortcomings of Minute 323's market provisions. One option to increase efficiency would be to increase the number of buyers and reduce transaction costs. Creating a flexible exchange through which any Basin state could purchase part of Mexico's allocation would more consistently put the water to its highest-value use. Allowing all rights holders to freely transfer water would be ideal, but the 1944 Treaty would probably not authorize state-to-state transfers within the United States, as the treaty governs international water management.[178] Some likely impediments could be the political backlash of upsetting the current balance among basin states. The Colorado Compact allocates waters in fixed quantities, and suddenly granting a more economically developed and water-stressed state like California the power to supplement its Colorado River allocation might be politically unpopular in less populous states like Nevada and Arizona. Upsetting the balance through a little-known, technocratic body might be subject to further criticism as undemocratic.

Addressing a human right to water might be simpler. The water banking system already features numerous restrictions on Mexico's ability to create and use its reserves.[179] In a subsequent Minute, the parties could borrow language from Article 10 of the U.N. Watercourses Convention, adding that Mexico's Water Reserve must be used with "special consideration for vital human needs."[180] Though ambiguous, the provision could empower the IBWC to monitor the impacts of Mexico's reductions on the availability of water for drinking and sanitation. If there are indications that Mexico's Water Reserve is interfering with vital human needs, the program could be suspended until the problem is corrected. Mexico might consider such a mechanism to encroach upon its sovereignty by peering into its domestic uses. Yet Mexico would likely agree due to the overall scheme's valuable benefits to its water resources and infrastructure.

B. OBLIGATION TO PREVENT HARM TO OTHER RIPARIAN STATES

In addition to reasonable and equitable utilization, another core principle of transboundary water law is the obligation to prevent harm to other riparian states. Article 7 of the U.N. Watercourses Convention obligates states to "take all appropriate measures to prevent the causing of significant harm to other watercourse States."[181] When harm does in fact occur, states are further obligated to "take all appropriate measures" to eliminate or mitigate the harm.[182] The no-harm

178. *See generally* 1944 Treaty, *supra* note 27, art. 24.
179. *See* Minute 323, *supra* note 9, § II.C.
180. U.N. Convention, *supra* note 113, art. 10.
181. *Id*. art. 7.1.
182. *Id*. art. 7.2.

principle is not considered an absolute prohibition on causing harm to neighboring states, as such a prohibition would encroach deeply upon state sovereignty.[183] Instead, the principle works to complement but not supplant reasonable and equitable utilization: "the law may permit the causing of factual harm if that is equitable under the circumstances."[184]

The no-harm doctrine was most famously articulated in the *Trail Smelter* arbitration between the United States and Canada settled in 1941.[185] The dispute began in 1925, when air pollution drifted from a zinc and lead smelter in British Columbia into Washington state, damaging crops and forests.[186] Though the case involved transboundary air pollution, the problem is closely analogous to transboundary harm via international watercourses.[187] The 1941 judgment included a statement that is among the most cited propositions in international environmental law:

> [N]o State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury established by clear and convincing evidence.[188]

The tribunal sought to strike a balance between the interests of the Canadian industry and American agriculture by creating a detailed regime for the smelter's operation that accounted for factors like winds, climate, and growing season.[189] If the smelter adhered to the restrictions but nonetheless caused transboundary damages, it would provide compensation for the harm.[190]

Minute 323 aligns with and confirms the no-harm principle, particularly in Section IV (Salinity Control Provisions). The 1944 Treaty notoriously omitted any reference to water quality, and it was not until 1974 that the IBWC first successfully addressed quality concerns with Minute 242.[191] The Minute required the United States to monitor and limit salinity, which had reached harmful levels as the Colorado River waters passed through irrigation districts in the Lower Basin states of the United States.[192] Minute 323 confirms the United States' obligation not to harm Mexico by providing further assurance that Mexico's allocation will maintain safe levels of salinity. The increased flexibility of Mexico's

183. *See* MCCAFFREY, *supra* note 3, at 415–19.
184. *Id*. at 416.
185. *Id*. at 419.
186. John D. Wirth, *Trail Smelter Dispute: Canadians and Americans Confront Transboundary Pollution, 1927-1941*, ENVTL. HIST. 34, 34 (Apr. 1996).
187. *See* MCCAFFREY, *supra* note 3, at 419.
188. U.N. Reports of Int'l Arbitral Awards, *Trail smelter case*, 1938, 1965 (1941). Available at http://legal.un.org/riaa/cases/vol_III/1905-1982.pdf.
189. *See id*. Part IV, at 1966–80.
190. *Id*. Part V, at 1980.
191. *See generally supra* note 31, at 29.
192. *See* 1944 Treaty, *supra* note 27, art. 25.

Water Reserve and recoverable water savings allows Mexico to import lower quantities in some years and higher quantities in others. If Lower Basin irrigation districts continue to use normal quantities while Mexico receives less, then the salt would be less diluted. This might result in salinity levels too high for human and even agricultural consumption, possibly causing significant harms to health and the economy in Mexico. Minute 323 seeks to avoid such harms with several features in the Salinity Control Provisions: monitoring and limiting salinity levels, use of the Wellton-Mohawk bypass drain, and maintenance of the Mejorada Canal.[193]

A key distinction between these provisions and more typical manifestations of the no-harm principle is the mutual responsibility for potential harm. In the *Trail Smelter* arbitration, the harm was caused by the unilateral actions of one state, Canada's smelter being the sole source of the degradation at issue. Conversely, the United States and Mexico have jointly devised a scheme in Minute 323 that benefits both parties by allowing the Lower Basin states to avoid austere cutbacks and granting Mexico greater flexibility to call on its allocation. Activities in the United States proximately cause the harm, though the parties already had mitigation measures in place, like those of Minute 242. Through Minute 323, the United States agrees to take appropriate measures to prevent *additional* harm caused by joint activities in a shared developmental scheme.

This broader conception of the no-harm principle is essential for addressing scarcity in transboundary river basin agreements. States must act jointly to respond to scarcity, and it will always be true that multiple states contribute to and benefit from international water marketing schemes. The no-harm obligation overlaps with reasonable and equitable utilization by ensuring that states share only their equitable portion of the burdens imposed by use of shared water resources. International river basin stakeholders should look to Minute 323's salinity control provisions as a model for guaranteeing that even joint activities do not cause disproportionate harm to individual states.

Though Minute 323 seeks to prevent the harm of increased salinity, there are other harms left unaddressed. The 1944 Treaty did not address groundwater in the Colorado River Basin, and the IBWC has given only minimal consideration to the issue.[194] Yet what happens to the Colorado River surface waters impacts groundwater resources in the region. Farmers in the Mexicali Valley are heavily dependent on their water allocations, and any reduction is likely to increase their reliance on groundwater.[195] Minute 323 gives no consideration to the risks of over-pumping groundwater aquifers, which may cause harm through land subsidence and the depletion of Mexico's water resources not covered by the agreement.

193. Minute 323, *supra* note 9, § VI.
194. *See* Umoff, *supra* note 33, at 85, 86, and 95–97.
195. Dibble, *supra* note 176.

The absence of any groundwater protections reveals that the parties have not in fact taken "all appropriate measures" to prevent significant harm to basin states. The lack of any framework with which to address groundwater in general also complicates the parties' ability to address it on a case-by-case basis. In the long term, the United States and Mexico need to comprehensively address groundwater issues in the Colorado River Basin.[196] In the short term, the IBWC could include in a subsequent Minute financing and technical support for groundwater monitoring in transboundary aquifers and aquifers likely impacted by Mexico's use of its Water Reserve. The provision could also trigger suspension of contributions to Mexico's Water Reserve if groundwater aquifers reach critical levels. Mexico may be reluctant to further limit its flexibility and to allow the United States to monitor its domestic agricultural practices, but the technical support from the IBWC and the long-term vision Mexico has shown in Minute 323 might persuade it to embrace groundwater monitoring.

C. OBLIGATION TO PROTECT INTERNATIONAL WATER COURSES: SALINITY CONTROL AND WATER FOR THE ENVIRONMENT

Section VIII's water allocation under the Water for the Environment program aligns with a developing principle of transboundary water law: the obligation to protect international watercourses. In 1997, the International Court of Justice in the *Gabcikovo-Nagymaros Project* case observed "new norms" that require reconciling "economic development with protection of the environment."[197] International law has increasingly recognized the obligation as applied to transboundary, non-navigational water uses since the early 1990s.[198]

Minute 323's salinity provisions in Section VI comport with the obligation as traditionally understood: mitigating downstream environmental harms due to upstream development.[199] The commitment of the United States to maintain an appropriate level of salinity in Mexico's allocation and to divert higher-salinity flows to the Delta helps to ensure that upstream water usage, particularly agricultural, does not cause significant degradation to the basin ecosystem in Mexico.

The Water for the Environment program goes a step further. Instead of mitigating environmental harms concurrent to utilization of water resources, the program proactively seeks improvements in a long-degraded area of the basin ecosystem.[200] Minute 319, which started Water for the Environment as a pilot

196. *See generally* Robert C. Gavrell, *The Elephant Under the Border: An Argument for a New, Comprehensive Treaty for the Transboundary Aquifers of the United States and Mexico*, 16 COLO. J. INT'L ENVTL. L. & POL'Y 189 (Winter 2005).

197. Gabcikovo-Nagymaros Project, Judgement, 1997 I.C.J. 7, ¶ 78 (Sept. 25, 1997).

198. *See* MCCAFFREY, *supra* note 3, at 453–58.

199. Minute 323, *supra* note 9, § VI; *see* MCCAFFREY, *supra* note 3, 449.

200. The United States' mid-century dam projects were largely responsible for the Delta's degradation. *See* Pitt, *supra* note 36.

program, appeared to be the first international treaty to allocate a quantity of water expressly for environmental purposes.[201]

It is important to note the program's market-based origins. Buying and leasing water for environmental purposes has been a developing tactic in the western United States since the 1980s.[202] There are several inherent limitations of the approach. The first is the high cost of water rights in regions experiencing scarcity,[203] making substantive environmental projects challenging. Another is that "long-term success in this endeavor will require funding levels in proportion to the cost of providing enough water to be ecologically meaningful."[204]

The Raise the River coalition acquired water rights from voluntary sellers in the Mexicali Valley.[205] Minutes 319 and 323 built on the legwork and momentum of Raise the River in establishing its Water for the Environment program. The inclusion of the United States and Mexico as equal partners helped to overcome the high cost of water as a barrier to entry. The second challenge remains: the program has allocated water through December 31, 2026, but it will require substantial funding and water forever. Without consideration of increasing demand through population growth, scarcity will likely intensify: climate change is expected to reduce Colorado River flows by over 9% by 2060.[206] Delta restoration will come under increasing pressure from competing uses, and there is no guarantee that the Minute negotiators in 2026 and beyond will find water to spare.

Water for the Environment sets a new standard for transboundary river agreements, showing that even in times of scarcity, parties have a duty to protect the environment. Such agreements can go further than simply mitigating environmental harm. They can and should affirmatively create environmental benefits to basin ecosystems.

CONCLUSION

By the IBWC's own admission, Minute 323 is not a complete fix.[207] But within the constraints of the 1944 Treaty, Minute 323 moves the basin-wide cooperation towards both a market-based system and greater care for the environment. The parties share drought and surplus equitably. The Binational Water Scarcity Contingency Plan helps the United States avert austere cutbacks without

201. King, *supra* note 2, at 104; *U.S. and Mexico to send water into parched Colorado River Delta*, ENVTL. DEF. FUND (Mar. 3, 2014), https://www.edf.org/media/us-and-mexico-send-water-parched-colorado-river-delta.

202. Reed D. Benson, *Public Funding Programs for Environmental Water Acquisitions: Origins, Purposes, and Revenue Sources*, 42 ENVTL. L. 265, 266 (2012).

203. *Id*. at 272–73.

204. *Id*. at 274.

205. RAISE THE RIVER, *supra* note 99.

206. Squillace, *supra* note 149, at 57.

207. *See* IBWC Press Release, *supra* note 8.

significant losses to Mexico's allocation. Both Mexico's Water Reserve and the Investments and Projects exchange promote a more efficient allocation of water resources. The salinity control provisions ensure that Mexico is not disproportionately harmed by the more flexible allocation scheme. The Water for the Environment project is a groundbreaking commitment to fulfill the parties' obligation to protect the watercourse ecosystem. The parties reached the comprehensive agreement through an equitable process that relied on stakeholders to provide localized, expert, and diverse perspectives. The limited nature of the market will hinder efficiency, the silence regarding a human right to water is troubling, and the long-term health of the Delta remains uncertain. But in the face of imminent climatic challenges, Minute 323 represents progress towards the optimal and sustainable utilization of one of North America's most important rivers.