A National Obligation to Mexico in the Colorado River Basin

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The law bankrupted the Colorado River from the beginning, promising more water than it could deliver. Among the most consequential of these promises is the "national obligation" the United States owes to Mexico under the 1944 Water Treaty and incorporated into domestic law by the Colorado River Basin Project Act of 1968. This article examines how that obligation has shaped, and continues to reshape, the Law of the River. It argues that the "national obligation" language represents a substantive reordering of water shortage risks within the basin and creates responsibilities and opportunities for the federal government to invest in water supply augmentation to meet its national obligation to Mexico.

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INTRODUCTION

There is an oft-repeated refrain in water law: "Better to be upstream with a shovel than downstream with a right." In the Colorado River Basin, Mexico is the furthest downstream party, holding clearly articulated rights to the river and looking upstream at thousands of shovels looking to move water to thirsty farms, industries, and cities. In the early stages of the development of the hydro-diplomatic relationship between the U.S. and Mexico, the U.S. federal government took the position that American shovels owed nothing to their downstream neighbors on the other side of the border. This position of absolute territorial sovereignty was referred to as the "Harmon Doctrine," named for U.S. Attorney General Judson Harmon who advocated for this approach to transboundary relationships on international rivers in 1895.[1]

The Harmon Doctrine did not last long as a governing principle in the Colorado River. In 1922, the states sharing the Colorado River Basin negotiated the Colorado River Compact, which explicitly contemplated a Mexican right to waters of the Colorado River.[2] As part of an effort to secure a reliable ally at it southern border during World War II, the U.S. abandoned the Harmon Doctrine in 1944 by agreeing to the Treaty for the Utilization of Waters of the Colorado, Tijuana and Rio Grande Rivers (the "1944 Water Treaty").[3] The 1944 Water Treaty recognized Mexico's right to 1.5 million acre-feet each year (af/y) of water from the Colorado River.[4] Despite this recognized right under treaty, Mexico still looked upstream at thousands of shovels within seven basin states with uncertainty as to which shovels would honor its right by letting the water flow south.

The Colorado River Basin Project Act of 1968 (the "CRBPA") resolves that uncertainty. Designed to authorize the Central Arizona Project (CAP), which is the canal that transports a portion of Arizona's Colorado River allotment into central Arizona, the CRBPA also clarified the hierarchy of

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1. *See* Judson Harmon, Treaty of Guadalupe Hidalgo—International Law, 21 Op. Att'ys Gen. 274 (1895); *see also* Stephen C. McCaffrey, *The Harmon Doctrine One Hundred Years Later: Buried, Not Praised*, 36 NAT. RES. J. 965, 967 (1996) ("This opinion has become so synonymous with the doctrine of absolute territorial sovereignty that it now stands as the doctrine's cornerstone, if not its entire foundation.").

2. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324 (1928); ARIZ. REV. STAT. ANN. § 45-1311.

3. Treaty for the Utilization of Waters of the Colorado, Tijuana and Rio Grande Rivers art. 10, Mex.-U.S., Feb. 3, 1944, 59 Stat. 1219 (1946) [hereinafter 1944 Water Treaty]; *see also* Stephen P. Mumme, *The Case for Adding an Ecology Minute to the 1944 United States-Mexico Water Treaty*, 15 TULANE ENV'T. L.J. 239, 241 (2002).

4. 1944 Water Treaty, *supra* note 3, art. 10. One acre-foot is 325,851 gallons or 1,233.48 m^3. It is so named because it is roughly the amount of water of one acre flooded to a depth of one foot.

obligations among the Basin states and between the United States and Mexico.[5] The 1922 Colorado River Compact, the 1944 Water Treaty, and the CRBPA, along with a complex interplay of compacts, statutes, treaties, contracts, and decrees, form the so-called "Law of the River" that governs the allocation of the waters of the Colorado River Basin.

Under the CRBPA, the U.S.' obligation to deliver 1.5 million acre-feet annually to Mexico under the 1944 Water Treaty "constitutes a national obligation."[6] The meaning of that clause has profound implications. It reflects Congress's intent that no single state bears the cost of international promises made by the federal government. In the current climate of uncertainty and contention over shortage sharing in the Colorado River Basin, this national obligation to Mexico may intensify disputes between Basin states or perhaps unify them to implement innovative solutions, as surely a "national obligation" is intended.

In this article, I argue that the "national obligation" clause in the CRBPA is not merely a rhetorical flourish but a substantive commitment that redistributes risk and priority within the Law of the River and to develop innovative solutions that include the augmentation of water supplies in the Basin. By recognizing the national character of the obligation owed to Mexico under the 1944 Water Treaty, Congress placed international commitments above intrastate allocations, saying that every shovel upstream of Mexico has a role to play in honoring and preserving the integrity of the U.S. government. Further, the provision implicitly requires interstate solidarity, suggesting that Upper Basin states share responsibility in ensuring treaty compliance, even if shortages are felt most acutely in the Lower Basin. Still, innovative solutions could include "augmentation" projects contemplated within the text of the CRBPA. Those augmentation projects could have profound implications for water supplies, the cost of water provision, and the priority of water rights. Furthermore, water augmentation projects that shift some water supplies from the snowcapped Rocky Mountains to desalination plants on Mexican coasts may shift the power from those diverting water with shovels upstream to those desalting water downstream.

The stakes are not academic. Climate change, prolonged drought, increasing demands, and declining reservoir storage have brought the

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5. Colorado River Basin Project Act of 1968, Pub. L. No. 90-537, 82 Stat. 885 (1968) (codified as amended at 43 U.S.C. §§ 1501–1556).

6. *Id.* § 202.

Colorado River system to the brink of crisis.[7] Recent shortage-sharing agreements and drought contingency plans show that the basin states can unify to adapt water management to these changing circumstances.[8] However, with the expiration of these agreements looming at the end of 2026, we risk shovels being raised in anger to contend over a shrinking river, rather than being lowered to collaboratively manage a shared resource where each shovel is a part in honoring a national obligation to our neighbor.[9]

This Article proceeds in three parts. In Part I, I lay out the basic legal background on the Law of the River, including its application to Mexico. In Part II, I explain the source and meaning of the "national obligation" to Mexico and its implications for shortage sharing in the Colorado River Basin. In Part III, I describe the role of augmentation in meeting that national obligation to Mexico and propose and evaluate various approaches to such water supply augmentation in the Colorado River Basin.

I. ARCHITECTURE OF THE LAW OF THE RIVER

The Law of the River is an extremely complicated governance structure, integrating the state laws of prior appropriation, federally reserved water rights, interstate water law developed by the U.S. Supreme Court, multiple interstate compacts, legislation at the state and federal levels, tribal laws, international treaties, court decrees and orders, and an array of contracts.

The Law of the River operates at times within and other times outside of the broad principles of western water law. Many of the intra-state water disputes along the Colorado River's tributaries are governed by prior appropriation, and the principles of prior appropriation still find their way into aspects of the Law of the River.[10] Prior appropriation is a "first-in-time, first-in-right" regime. A user who puts a certain quantity of water to a certain beneficial use without waste has a superior claim to that quantity of water for that use at that diversion point over any other subsequent user.[11] Water users who fail to put their water to a beneficial use over a period may risk forfeiting their water right.[12] When there is insufficient water in the river to satisfy all users' rights, there is a "call on the river" in which the junior users must

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7. Jason Anthony Robison, *Confluence: The Colorado River Compact's Centennial*, 22 WYO. L. REV. 11, 18–20 (2022).

8. *See generally id.*

9. *Id.* at 19.

10. *See, e.g.*, Arizona v. California, 373 U.S. 546, 581 (1963).

11. Rhett B. Larson, *Overcoming Constitutional Obstacles to the Resolution of General Stream Adjudications*, 8 ARIZ. J. ENV'T L. & POL'Y 52, 54 (2018).

12. *Id.* at 55.

forebear from diverting water to satisfy senior water rights holders who have not forfeited their rights.[13] Water users with junior priority rights may take water out of priority if there is insufficient hydraulic head and a usable quantity of water would not reach a downstream senior water right holder, under the "futile call doctrine."[14]

Western water law integrates this state-based prior appropriation regime with a federal water rights regime of reserved rights. Under the U.S. Supreme Court's decision in 1908 in *Winters v. United States*, all federal reservations of land (including for Native American reservations, national forests, military bases, etc.) have implicitly reserved water rights.[15] Generally speaking, the priority date for these federally reserved rights (sometimes called "*Winters* rights") is the date the reservation was created.[16] The amount of water for these rights depends on a variety of factors and the nature of the reservation, but in at least some instances the amount is the minimum quantity of water necessary to meet the primary purpose of the reservation.[17] For tribal reservations and under federal law, the amount of water under these rights is based on the tribe's practicably irrigable acreage ("PIA").[18] Arizona takes a different approach to quantifying a tribe's *Winters* rights, quantifying the amount necessary to establish a permanent homeland based on a variety of considerations.[19]

Within this framework of broad western legal principles, this Part provides background on the Law of the River, including expansive inter-state legal relationships, to contextualize the more specific aspects governing the relationship between the U.S. and Mexico in sharing the river.

A. The Colorado River Compact & Boulder Canyon Project Act

The foundation of the Law of the River is the *Colorado River Compact of 1922*.[20] Negotiated under the authority of the Reclamation Act of 1902 and the Compact Clause of the U.S. Constitution, the Compact sought to resolve growing disputes among the seven basin states regarding the equitable

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13. *Id.* at 56.
14. *Id.*
15. Winters v. United States, 207 U.S. 564 (1908).
16. Cappaert v. United States, 426 U.S. 128, 138 (1976).
17. *Id.* at 141; *see also* United States v. New Mexico, 438 U.S. 696, 718 (1978).
18. Arizona v. California, 373 U.S. 546, 600–01 (1963).
19. *In re* Gen. Adjudication of All Rts. to the Use of Water in the Gila River Sys. & Source, 35 P.3d 68, 78–80 (Ariz. 2001).
20. *See* Arizona v. California, 373 U.S. at 564–65 (describing the development of the Compact and further legal structures that affect the Law of the River).

division and apportionment of the waters of the Colorado.[21] Certain decisions reached by the U.S. Supreme Court had catalyzed the desire to reach a negotiated compact solution rather than attempt to litigate states' relative priorities. In 1911, the Court, in *Bean v. Morris*, applied the doctrine of prior appropriation in a dispute between water users in Montana and Wyoming.[22] In 1922, the Court applied the same approach in *Wyoming v. Colorado*, holding that when two states share the same intra-state water rights regime, that same regime will be applied between states.[23] These decisions meant that, absent a Compact, prior appropriation would have governed the allocation of water between the seven basin states. The rapid agricultural and urban development in California threatened to lock of much of the river for California users based on prior appropriation.[24]

Under this looming concern, and at the urging of then-Commerce Secretary Herbert Hoover, commissioners from Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming convened to address the increasing demands on the river and the growing interstate rivalry.[25] The Compact divided the Colorado River system into two hydrological and political units: the *Upper Basin* (Colorado, New Mexico, Utah, Wyoming, and part of Arizona) and the *Lower Basin* (Arizona, California, and Nevada).[26] Each Basin was allocated the beneficial consumptive use of 7.5 million acre-feet (MAF) of water annually, measured at Lee Ferry, Arizona, a point just downstream of Glen Canyon Dam and upstream of the Grand Canyon.[27] In addition, Article III(b) of the Compact authorized the Lower Basin to increase its beneficial consumptive use by an additional 1 MAF annually from the mainstream of the River.[28] Article III(d) provides that

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21. Reclamation Act of 1902, Pub. L. No. 57-161, 32 Stat. 388 (codified as amended in scattered sections of 43 U.S.C.); U.S. CONST. art. I, § 10, cl. 3 ("No State shall, without the Consent of Congress . . . enter into any Agreement or Compact with another State.").

22. Bean v. Morris, 221 U.S. 485 (1911).

23. Wyoming v. Colorado, 259 U.S. 419 (1922).

24. Joe Gelt, *Sharing Colorado River Water: History, Public Policy and the Colorado River Compact*, 10 ARROYO, no. 1, 1997, https://wrrc.arizona.edu/publication/sharing-colorado-river-water-history-public-policy-and-colorado-river-compact [https://perma.cc/7QDE-RN8R].

25. *See* REPORT OF THE COLORADO RIVER COMMISSION (1922), *reprinted in* DOCUMENTS ON THE USE AND CONTROL OF THE WATERS OF INTERSTATE AND INTERNATIONAL STREAMS 39 (T. Richard Witmer ed., U.S. Dep't of Interior 1956); *see also generally* Lawrence J. MacDonnell, *The 1922 Colorado River Compact at 100*, 33 W. LEGAL HIST. 97 (2023) (discussing the Compact negotiations and Hoover's role).

26. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. II(f)–(g) (1928).

27. *Id.* art. III(a).

28. *Id.* art. III(b).

Upper Basin "shall not cause the flow at Lee Ferry to be depleted below 75 MAF for any period of ten consecutive years."[29]

Notably, the Compact did not apportion water among individual states within each Basin, nor did it specify the method for satisfying any international obligations to Mexico, which had not yet been established in 1922. Under Article III(c) of the Compact, the United States' potential obligations to Mexico should first be fulfilled with surplus water, not apportioned by the compact, and if the surplus is not enough, "the burden of such deficiency shall be equally borne" by the Upper and Lower Basins.[30] This provision foreshadowed later controversies and the articulation of the "national obligation," as it implied that the Basin states collectively should share responsibility for future international commitments, though it left open whether and how the federal government or the states themselves would ultimately bear or share that burden.

Arizona initially refused to ratify the Compact, objecting that it did not adequately protect its share of Lower Basin water from California's rapidly expanding appropriations.[31] For more than two decades, Arizona resisted ratification, fearing that California's senior rights and aggressive development of the All-American Canal and the Metropolitan Water District's aqueduct system would leave Arizona with little practical access to its apportionment.[32] Only in 1944, when Arizona sought federal support for projects such as the Central Arizona Project, did it ratify the Compact.[33] It is not a coincidence that Arizona ratified the Compact in the same year that the U.S. and Mexico agreed to the Water Treaty. Arizona's ability to influence federal policy vis a vis Mexico would be severely limited if it remained outside of the Compact's structure, especially once that structure becomes more federalized by law and infrastructure investments.

During the period after the Compact's negotiation in 1922 and Arizona's ratification in 1944 along with the ratification of the 1944 Water Treaty, California sought federal support for the development of storage and conveyance infrastructure on the River.[34] If the 1922 Compact established the basic interjurisdictional legal structure, the Boulder Canyon Project Act of 1928 (the "BCPA") provided the operational and infrastructural machinery

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29. *Id.* art. III(d).
30. *Id.* art. III(c).
31. MacDonnell, *supra* note 25, at 119–21.
32. *Id.*
33. *See* WENDY NELSON ESPELAND, THE STRUGGLE FOR WATER: POLITICS, RATIONALITY, AND IDENTITY IN THE AMERICAN SOUTHWEST 99–100 (1998).
34. JASON ANTHONY ROBISON, CORNERSTONE AT THE CONFLUENCE: NAVIGATING THE COLORADO RIVER COMPACT'S NEXT CENTURY 24–25 (2022).

that began the transformation of the Lower Basin into a regulatable plumbing system.[35] The Act authorized construction of Hoover Dam and the All-American Canal, cementing federal control over major storage and delivery facilities on the Lower Colorado River and accelerating California's ability to more rapidly access the water.[36] It also gave congressional consent to the Colorado River Compact, contingent upon ratification by at least six of the seven Basin states.[37]

California quickly ratified the Compact in 1929, joined by Nevada, Utah, New Mexico, Colorado, and Wyoming, thereby satisfying the six-state threshold.[38] Under § 4(a) of the BCPA, the Lower Basin states were authorized to enter into a compact for the allocation of their 7.5 MAF/y allocations established by the Compact. The BCPA provided suggested raw water allocations, with 4.4 MAF/y to California and more than half of any surplus of unapportioned water, 2.8 MAF/y to Arizona with up to one-half of any surplus of unapportioned water, and 300,000 af/y to Nevada.[39] The three Lower Basin states never agreed on this authorized compact, but these allocations suggested in the BCPA became highly relevant in future Supreme Court decisions on the River.

With regards to Mexico, the BCPA provides that the Gila River (a tributary of the Colorado originating in New Mexico and flowing mostly through Arizona) is not subject to any diminution to provide water to Mexico.[40] The BCPA provides that if any obligation to Mexico cannot be satisfied from surplus, then California and Arizona "will mutually agree . . . to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin."[41] Otherwise, the BCPA provides, "Nothing in this Act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the water of the Colorado River system."[42]

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35. Boulder Canyon Project Act, Pub. L. No. 70-642, 45 Stat. 1057 (1928) (codified as amended at 43 U.S.C. §§ 617–617t).

36. *Id.*

37. *Id.* § 13(a).

38. NORRIS HUNDLEY, WATER AND WEST: THE COLORADO RIVER COMPACT AND THE POLITICS OF WATER IN THE AMERICAN WEST 276–81 (2d ed. 2009).

39. Boulder Canyon Project Act § 4(a).

40. *Id.*

41. *Id.*

42. *Id.* § 20.

B. The 1944 Water Treaty & Salinity Challenge

The 1944 Water Treaty represented a turning point in the legal regime of the Colorado River. For the first time, the United States formally bound itself by international law to deliver a fixed quantity of water from the Colorado River to its southern neighbor. Under Article 10(a) of the Treaty, the United States guaranteed Mexico an annual allocation of 1.5 MAF/y of Colorado River water, with an additional 200,000 af/y available in years of surplus.[43]

The Treaty must be understood against the backdrop of wartime diplomacy and domestic water politics. Negotiations with Mexico over transboundary water issues had been ongoing since the early twentieth century, but most particularly related to disputes over the Rio Grande.[44] However, it was the geopolitical context of World War II that accelerated the resolution.[45] The United States sought to solidify relations with Mexico as a hemispheric ally, and the Roosevelt Administration recognized that resolving longstanding water disputes could strengthen bilateral cooperation.[46] At the same time, California and Arizona were rapidly developing massive irrigation systems near the border dependent on Colorado River flows.[47] Mexican agriculture in the Mexicali Valley, dependent on both the Colorado River as well as groundwater seepage from irrigation infrastructure in Arizona and California, pressed the Mexican federal government for assurances that upstream U.S. development would not impact its water supply.[48]

The Treaty's allocation to Mexico was both a foreign policy instrument and a domestic allocation decision. By committing 1.5 MAF annually, the federal government effectively reduced the water available for apportionment among the Basin states, even though the Compact had left international obligations unresolved, and increased the transaction costs of negotiation by recognizing another vested party.[49] Arizona and other Basin states initially resisted assuming responsibility to satisfy the Treaty right held by Mexico, arguing that the federal government had undertaken the obligation unilaterally and should satisfy it from national resources rather than intrastate

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43. *See* 1944 Water Treaty, *supra* note 3, art. 10(a)–(b).

44. *See* STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES 285 (2d ed. 2007).

45. *See* ESPELAND, *supra* note 33, at 99–100.

46. *Id.*

47. Benjamin P. Warner & Anthony Meluso, *"We Are Fingers of a Hand That Make a Fist": Working-Class Alliances in Colorado River Water Protests in the Mexicali Valley, Mexico*, 15 WATER ALTS. 341, 344–49 (2022).

48. *Id.*

49. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(c) (1928).

allocations.[50] The Bureau of Reclamation, at the time, operated on the premise that the obligation would be satisfied from the mainstream, thereby effectively reducing the pool available to U.S. users in the basin.[51] While the diplomatic and equitable considerations certainly weigh in favor of recognizing and protecting a Mexican right to Colorado River water, such recognition undoubtedly makes an already complicated legal knot downright Gordian.

To manage, if not untangle, this knot, the Water Treaty expanded on the powers of the already-existing International Boundary Commission established in 1899 and reorganized it into the International Boundary and Water Commission (the "IBWC").[52] The IBWC is a bilateral commission, with one commissioner appointed as an ambassador representing each country (the Mexican side is referred to as the Comisión Internacional de Límites y Agua, or "CILA").[53] The IBWC was empowered to interpret the Water Treaty, oversee water deliveries, and negotiate subsequent implementing agreements ("Minutes").[54] In subsequent years, the IBWC has been empowered to own and operate certain water infrastructure relevant to the transboundary relationship, including critical wastewater and stormwater collection and treatment facilities relied on by border communities.[55] The IBWC has since played a central role in adapting the otherwise largely rigid allocation regime in the basin to account for changing hydrological and political realities. Because of its ability to own and operate infrastructure and negotiate and adopt Minutes, the IBWC may be the nimblest aspect of the Colorado River's governance.

The Treaty created an immediate challenge of integrating a new international law into a two-decade-old, but still developing, interstate water management regime. While the Compact had contemplated possible international obligations in Article III(c), it left ambiguous whether such obligations would be met from "surplus waters" or, in case of insufficiency, proportionally shared between the Basins.[56] The 1.5 MAF/y guarantee,

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50. *See* Charles J. Meyers & Richard L. Noble, *The Colorado River: The Treaty with Mexico*, 19 STAN. L. REV. 367, 381–82 (1967).

51. HUNDLEY, *supra* note 38, at 91–92.

52. 1944 Water Treaty, *supra* note 3, art. 2.

53. *Id.* at 5–6.

54. *See* DAVID H. GETCHES ET AL., WATER LAW IN A NUTSHELL 429–32 (5th ed. 2015).

55. Paul Ingram, *Long-Delayed Cross-Border Sewer Pipe Rehab Completed in Nogales*, TUCSON SENTINEL (May 17, 2024), https://www.tucsonsentinel.com/local/report/051724_ioi_completion/long-delayed-cross-border-sewer-pipe-rehab-completed-nogales/ [https://perma.cc/LU46-ZH6C].

56. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(c) (1928).

however, exceeded what could be considered mere surplus, particularly as long-term hydrologic data began to reveal that the Compact's assumption of water availability was increasingly and apparently overly optimistic.[57]

The Treaty not only had to be integrated into an already crowded water supply regime, but also itself integrated new water quality concerns as part of the broader management of the river. While the Treaty guaranteed Mexico a fixed quantity of water, it was silent on quality.[58] However, what good is a guaranteed quantity of unusable water? By the 1960s, return flows from irrigated agriculture in the Lower Basin had raised salinity levels to the point of causing severe damage to Mexican agriculture in the Mexicali Valley.[59]

Salinity in the headwaters of the Colorado River is less than 50 parts per million (ppm).[60] But due to agricultural runoff, the Colorado River crossed the U.S.-Mexico border with salinity levels over 1200 ppm, causing significant environmental and ecological harm in northern Mexico.[61] Mexico issued a formal protest that these salinity levels effectively violated the 1944 Water Treaty.[62] The two countries reached an agreement, culminating in one Minute to the 1944 Water Treaty, one piece of domestic U.S. legislation, and an ongoing infrastructure development and management challenge.[63]

In 1973, the IBWC agreed to Minute 242 to limit the salinity of Colorado River water delivered to Mexico pursuant to the 1944 Water Treaty to no more than 115 ppm salinity, plus or minus 30 ppm above the salinity of water delivered to U.S. users at Imperial Dam.[64] This agreement effectively imposed new operational requirements on the Lower Basin and highlighted how international obligations could expand beyond the four corners of the 1944 Treaty, binding domestic users to evolving international norms. It also altered domestic laws and infrastructure. To maintain the agreed-upon salinity level, the U.S. government enacted the Colorado River Basin Salinity

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57. *See* Robert Adler, *Climate Change and the Hegemony of State Water Law*, 29 STAN. ENV'T. L.J. 1, 14–16 (2010) (noting that the Compact relied on an unusually wet hydrologic period).

58. *See* 1944 Water Treaty, *supra* note 3, art. 10.

59. *See* Francisco Oyarzabal-Tamargo & Robert A. Young, *International External Diseconomies: The Colorado River Salinity Problem in Mexico*, 18 NAT'L RES. J. 77, 79 (1978).

60. U.S. DEP'T OF THE INTERIOR GEOLOGICAL SURV., RIVER BASINS OF THE UNITED STATES: THE COLORADO 8.

61. Oyarzabal-Tamargo & Young, *supra* note 59, at 79.

62. Rhett B. Larson, *Innovation and International Commons: The Case of Desalination under International Law*, 2012 UTAH L. REV. 759, 768.

63. For an overview of the history and laws related to the salinity conflict in the Colorado River Basin between Mexico and the U.S., see *id.* at 767–69.

64. Agreement Confirming Minute No. 242 of the International Boundary and Water Commission, U.S.-Mex., Aug. 30, 1973, 24 U.S.T. 1968 [hereinafter Minute 242].

Control Act, which authorized the construction and operation of a desalination plant in Yuma, Arizona to treat elevated salinity levels in the Colorado River before it crossed into Mexico.[65] The cost of this plant was more than $245 million in 1974, and the cost of its operation is so high that it has only operated sporadically since its completion.[66]

Without the desalting plant's operation in Yuma, the U.S. has attempted to comply with its treaty obligation and domestic law regarding salinity levels by diverting agricultural runoff away from the Colorado River to the Cienega de la Clara wetlands in Mexico.[67] This diverted water amounts to more than 130,000 af/y, and while elevated in salinity and other contaminants from the runoff, it supports a wetland protected under international law and home to a number of endangered species.[68] Operating the Yuma desalting plant would be expensive and potentially damaging to the wetland, but would make more water accessible to users in the Basin while complying with treaty obligations on salinity levels. The U.S. can continue to meet those water quality obligations by diverting agricultural runoff to support (and contaminate) the wetlands while keeping a large amount of potentially usable water out of reach. Or the U.S. can violate its treaty obligations regarding salinity. As with so many aspects of the hydro-diplomatic relationship between the U.S. and Mexico, there are winners and losers, even with real innovations and investments.

The 1944 Treaty remains a central pillar of the Law of the River. It not only binds the United States internationally but also shapes the domestic allocation system by reducing the water available to U.S. states and tribes. Its incorporation into federal law through the BCPA, the CRBPA, and Supreme Court decrees underscores the centrality and priority of international commitments in the hierarchy of Colorado River obligations. The Treaty also sets the stage for the "national obligation" clause in the CRBPA and the impact those two words have on the questions of both water supply allocation and water quality related to salinity. More fundamentally, the Treaty cemented the principle that the Colorado River is not merely a domestic interstate resource but an international river, whose governance must balance federalism with diplomacy.

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65. Colorado River Basin Salinity Control Act, Pub. L. No. 93-320, 88 Stat. 266 (1974).
66. Larson, *supra* note 62, at 768–69.
67. *Id.* at 769.
68. *Id.*

C. Arizona v. California and Its Decree

The conflicts around supply between the U.S. and Mexico on the Colorado River were a part of the broader conflict, which came to a head in the seminal U.S. Supreme Court decision in *Arizona v. California*.[69] Filed originally in 1952, the case represented Arizona's attempt to break California's control over the Lower Basin's mainstream allocations, exclude Arizona's tributaries from counting toward its allocation from the mainstem of the River, and to secure a judicially enforceable entitlement to water for its long-sought Central Arizona Project.[70]

At issue was the proper interpretation of the BCPA and its relationship to the Colorado River Compact. Arizona argued that the BCPA effected a congressional apportionment of the mainstream among the Lower Basin states, whereas California contended that the Compact, not the BCPA, governed allocations and that interstate disputes should be resolved through state law appropriation doctrines.[71] While early in the development of its jurisprudence on interstate water law, the Court applied prior appropriation between states that shared that water rights regime, the Court had moved in a different direction by the early 1960s. In 1945, the Supreme Court decided a transboundary water dispute between Nebraska and Wyoming, two states that share prior appropriation regimes, but stated that shared state water rights principles are only a guide, and the Court's ultimate goal is to secure a "just and equitable" allocation of water.[72] The Court's integration of broader considerations than just shared state water rights principles has evolved into its "equitable apportionment" jurisprudence.[73]

The decreasing strict reliance on prior appropriation, and the increasing tensions on the Colorado River caused by integrating the Mexican treaty right and new federal infrastructure investments, made the outcome of *Arizona v. California* unpredictable and critical for water law throughout the country. The United States, intervening both as trustee for Indian tribes and as the operator of federal reclamation facilities, complicated the litigation by asserting that the Secretary of the Interior possessed plenary authority to allocate mainstream water through contracts under § 5 of the BCPA.[74] Thus,

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69. 373 U.S. 546 (1963).

70. Josh Patashnik, Arizona v. California *and the Equitable Apportionment of Interstate Waterways*, 56 ARIZ. L. REV. 1, 10–11 (2014).

71. *Id.* at 24–25.

72. Nebraska v. Wyoming, 325 U.S. 589, 618 (1945).

73. *See generally* Lauren D. Bernadett, *Equitable Apportionment in the Supreme Court: An Overview of the Doctrine and the Factors Considered by the Supreme Court in Light of Florida v. Georgia*, 29 J. ENV'T L. & LITIG. 511 (2014).

74. Arizona v. California, 373 U.S. at 580–81.

the case became not just one of critical importance to state and tribal water rights, but to understandings of federalism and executive power.

In a landmark opinion authored by Justice Hugo Black, the Court sided largely with Arizona, holding that the BCPA constituted a congressional apportionment of the Lower Basin's mainstream.[75] Specifically, the Court, despite the absence of the compact called for in the BCPA, determined that Congress had allocated 4.4 MAF/y to California, 2.8 MAF/y to Arizona, and 0.3 MAF/y to Nevada, with any surplus subject to further apportionment.[76] The Court also excluded tributaries in Arizona from the accounting of Arizona's entitlement to the mainstream of the Colorado River.[77] The Court rejected California's claim that the Compact alone governed allocations, reasoning that Congress had spoken clearly in the BCPA to resolve uncertainties left by Arizona's refusal to ratify the Compact until 1944.[78] The Court also recognized the broad authority granted by Congress to the Secretary of the Interior to decide allocations in times of shortage.[79]

Perhaps the most significant doctrinal innovation of *Arizona v. California* was its recognition of substantial federal reserved water rights for Indian tribes along the mainstream and its articulation of the PIA standard for quantifying tribal water rights. The Court held that, under the *Winters* doctrine, reservations established by the federal government carried with them implied rights to sufficient water to fulfill their purposes.[80] Applying this standard, the Court quantified and decreed reserved rights for five tribes—the Chemehuevi, Cocopah, Colorado River Indian Tribes, Fort Mojave, and Quechan—amounting to nearly one million acre-feet annually.[81] These rights were to be supplied from the Lower Basin and counted against the allocations of the Basin states.[82] This holding elevated the legal leverage of Native American tribes in the Colorado River Basin, stakeholders who had been largely ignored in the negotiation of the Compact and the Water Treaty. In so doing, the Court advanced the rights of tribes to an equitable share of their traditional water source, but just as with the 1944 Water Treaty, that fairness and equity came with the price of more users with more power in the Basin legal conflict.

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75. *Id.* at 564–65.
76. *Id.* at 565.
77. *Id.* at 567–69.
78. *Id.* at 562–64.
79. *Id.* at 593.
80. *Id.* at 599–600.
81. *Id.* at 595–96, 600–01.
82. *Id.* at 600–01.

Perhaps the aspect of the Court's holding with the broadest implications for American law is its affirmation of the Secretary of the Interior's plenary power to allocate mainstream water among Lower Basin users through contracts under the BCPA.[83] The Court emphasized that, unlike typical interstate rivers governed by state law, the Colorado River mainstream in the Lower Basin was subject to direct congressional and federal administrative control.[84] As Justice Black explained, the Secretary of the Interior is given the responsibility of apportioning the water by contracts, not the States.[85]

This ruling cemented the federal government's role in Colorado River management and ensured that interstate disputes would be mediated through the Secretary's authority. While the Secretary's power is somewhat limited in the Upper Basin, simply by virtue of the sheer number of non-federal diversion and projects, the U.S. Bureau of Reclamation's ownership and operation of Lake Powell and Lake Mead make the Bureau effectively the master of the Lower Basin. The Supreme Court's decision thus reaffirmed what infrastructure had already decreed. The scope and implications of this much power being affirmed by the Court as held by one agency over the water supply of millions of people raised in the mind of Justice Harlan, dissenting in the case, "the gravest constitutional doubts."[86] For Arizona, the power of the Secretary of the Interior and Bureau of Reclamation meant that access to water for the Central Arizona Project ("CAP") depended on securing favorable contracts from the Secretary, reinforcing the need for congressional authorization of the CAP in future legislation.[87]

Although Arizona prevailed in securing a quantified apportionment and excluding its tributaries, the Court's decision also entrenched California's preeminence in the Basin. California retained the largest Lower Basin allocation—4.4 MAF annually—together with rights to one-half of any surplus.[88] Because California had already developed extensive diversion and conveyance infrastructure, its legal entitlements translated into reliable, enforceable deliveries, whereas Arizona still lacked the means to divert its full share without construction of the CAP.[89] Thus, while the decision leveled the legal playing field in the Lower Basin to some degree, it practically

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83. *Id.* at 580–81.

84. *Id.* at 589–90.

85. *Id.* at 580–81.

86. *Id.* at 626 (Harlan, J., dissenting).

87. Reed D. Benson, *Whose Water Is It? Private Rights and Public Authority over Reclamation Project Water*, 16 VA. ENV'T L.J. 363, 416 n.310 (1997).

88. Arizona v. California, 373 U.S. at 565.

89. *See* MARC REISNER, CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER 284 (1986).

reinforced California's superior position until Arizona could complete the CAP.

Following its 1963 decision, the Court issued a detailed decree in 1964 implementing its holdings and retaining continuing jurisdiction over the case.[90] The decree quantified each state's entitlement, confirmed tribal reserved rights and respective quantities and priority dates, and established procedures for the Secretary of the Interior to administer contracts and deliveries.[91] Amendments in subsequent decades have adjusted allocations to reflect new tribal rights, shortage-sharing agreements, and evolving federal obligations.[92] The Court's retention of jurisdiction has proven consequential, as disputes over allocations, tribal rights, and federal operations continue to arise under the decree.[93]

In sum, *Arizona v. California* restructured the Lower Basin's legal framework by (1) recognizing a congressional apportionment under the BCPA; (2) affirming the Secretary's plenary authority over mainstream allocations; (3) recognizing massive tribal reserved rights; and (4) excluding Arizona's tributaries from its mainstream rights. Yet the decision also reaffirmed California's dominant position and underscored Arizona's dependence on federal funding to perfect much of its paper rights into flowing water through the CAP. The stage was thus set for Congress, in the CRBPA, to address the issue of the CAP and, relatedly, bring all basin states under the common cause of the "national obligation" owed to Mexico.

II. THE NATIONAL OBLIGATION TO MEXICO

The phrase "national obligation," codified in CRBPA § 301(b), did not emerge in a vacuum. Rather, it represented Congress's attempt to reconcile nearly two decades of interstate disputes, conflicting Compact interpretations, and persistent uncertainty regarding the integration of the 1944 Water Treaty into the Law of the River. The CRBPA was signed into law in 1968, authorizing the CAP, recognizing California's superior priority to 4.4 MAF/y from the Colorado River until the Colorado River was

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90. Arizona v. California, 376 U.S. 340, 353 (1964).

91. *Id.* at 342–45.

92. *See* Arizona v. California, 466 U.S. 144, 145–46 (1984) (modifying decree to account for additional tribal reserved rights); Arizona v. California, 531 U.S. 1, 1–3 (2000) (further modifications).

93. *See, e.g.*, Arizona v. Navajo Nation, 599 U.S. 555, 565–67 (2023) (holding that the Navajo Nation could not seek relief related to Colorado River operations by the U.S. Bureau of Reclamation in lower courts, but only before the U.S. Supreme Court because of its retained jurisdiction).

sufficiently "augmented" to satisfy Mexico's Treaty right, and explicitly making the satisfaction of Mexico's right a "national obligation." Thus, the critical legal questions in applying the CRBPA are the meaning of the phrase "national obligation" and the term "augmentation." This part explores the interpretation and application of the statutory language, and the structure and history of the CRBPA.

A. The Colorado River Basin Project Act

The CRBPA represented both the culmination of Arizona's decades-long struggle for perfected rights to the Colorado River and a critical new load-bearing column in the legal architecture of the River. Signed into law by President Lyndon B. Johnson on September 30, 1968, the Act authorized the Central Arizona Project, a massive aqueduct system to convey Colorado River water to the largest cities in central and southern Arizona. The CAP would also support the expansion of agriculture in central Arizona and form a critical source of water used to settle tribal water rights claims in the area.[94]

Arizona had lobbied for federal authorization of the CAP since the 1940s, but California consistently opposed the project, fearing that it would reduce the availability of surplus water for California's burgeoning cities and agricultural districts.[95] The size of California's congressional delegation relative to Arizona's, and the influence wielded by California legislators in Congress posed serious obstacles to advancing the authorization and funding of the CAP.[96]

By the mid-1960s, political dynamics shifted. Arizona secured powerful allies in Congress, including Senator Carl Hayden, whose seniority on the Appropriations Committee gave him leverage to push for CAP funding.[97] California ultimately agreed to drop its opposition to the CAP, but only on the condition that Arizona accept a statutory junior priority of CAP water rights. Thus, § 301(b) of the CRBPA provides that deliveries to the CAP shall be junior in priority to California's 4.4 MAF/y entitlement and to other mainstream contracts authorized under the BCPA.[98]

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94. Susan D. Brienza, *Wet Water vs. Paper Rights: Indian and Non-Indian Negotiated Settlements and their Effects*, 11 STAN. ENV'T L.J. 151, 191–92 (1992) (noting the role of CAP in tribal water rights settlements).

95. REISNER, *supra* note 89, at 301–02.

96. HUNDLEY, *supra* note 38, at 299–300.

97. Donald J. Pisani, *The Bureau of Reclamation and the West, 1945-2000*, 43 NEV. HIST. Q. 362, 371 (2000); *see generally* HUNDLEY, *supra* note 38.

98. 43 U.S.C. § 1521(b).

This concession meant that, in times of shortage, the CAP would be the first project curtailed, leaving Arizona's central and southern cities, Native American tribes, and productive agricultural land uniquely exposed to the risks of shortage.[99] Arizona accepted this subordination reluctantly, but pragmatically, recognizing that congressional authorization to CAP was essential to perfect its water rights, but without a full appreciation of the risks of shortage with climate change looming. Still, despite the risks posed by CAP's junior priority, the CRBPA made clarifications to the Law of the River that mitigate these risks to Arizona.

Most significantly for Arizona, the CRBPA codified in the United States' obligation to deliver water to Mexico under the 1944 Water Treaty shall be the "national obligation" of the United States.[100] This simple phrase would reverberate through subsequent disputes, as states and federal agencies debated whether the Treaty burden should be borne by particular Basin states or individual users or treated as a collective federal responsibility.

This language was designed to resolve disputes that had persisted since the Treaty's ratification in 1944. In those intervening years, California argued that deliveries to Mexico should come from surplus water available to the Lower Basin, effectively diminishing Arizona's share. The Upper Basin states feared that Treaty deliveries would be charged against their Lee Ferry delivery obligation. Under Article III(d) of the Compact, the Upper Basin must deliver 75 MAF over any consecutive ten-year period at Lee Ferry.[101] If Lower Basin supplies were insufficient to meet both the Lower Basin's allotment and Mexico's rights under the Treaty, California and Arizona could argue that the Upper Basin had failed to meet its Compact obligations. Arizona feared that, absent congressional clarification, it would be forced to bear a disproportionate share of the Treaty burden through reductions in CAP deliveries.[102]

When the Treaty was ratified in 1944, many western officials assumed that the United States would satisfy its 1.5 MAF/y commitment to Mexico from waters deemed "surplus" to Compact apportionments.[103] This interpretation relied on Article III(c) of the Compact, which provides that any Mexican

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99. *See* Thomas Buschatzke & Nicole Klobas, *Ensuring Arizona's Future Today: The Lower Basin Drought Contingency Plan*, 8 ARIZ. J. ENV'T. L. & POL'Y 29, 34 (2018).

100. 43 U.S.C. § 1512.

101. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(d) (1928).

102. For an overview of the respective positions of the basins and states regarding the satisfaction of the Mexican Treaty right, see generally APRIL R. SUMMITT, CONTESTED WATERS: AN ENVIRONMENTAL HISTORY OF THE COLORADO RIVER (2013).

103. *See Central Arizona Project: Hearings Before the S. Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs,* 90th Cong. 414 (1967).

Treaty obligation "shall be satisfied first from surplus waters unapportioned by this compact."[104] By the 1950s, California's expanding demands on the mainstream and Arizona's lobbying for the CAP made clear that little future "surplus" would remain to satisfy the Treaty right. Bureau of Reclamation studies showed that existing commitments nearly equaled or exceeded the dependable supply of the River.[105] This raised the prospect that Treaty deliveries might cut into state apportionments, reigniting fears that Arizona or Nevada would disproportionately bear the burden.

B. The Meaning of "National Obligation"

The "national obligation" clause reflected Congress's attempt to resolve these conflicting claims and assuage these fears by shifting responsibility to the federal government and the nation as a whole. On its face, the clause suggests that no individual Basin state should bear the Treaty burden alone, and that the federal government would ensure compliance using national resources and policy mechanisms.[106] Yet the practical meaning of the clause remains contested.

By declaring the Mexican Treaty a "national obligation," Congress effectively elevated international commitments above state allocations. This principle has had lasting consequences for Arizona and for the Law of the River more broadly. For Arizona, it provided a measure of security against the risk that CAP deliveries would be curtailed solely to satisfy Treaty deliveries.[107] For the Upper Basin states, the clause was a reminder that their own Compact obligation to deliver 75 MAF at Lee Ferry over ten years could be read in light of the Treaty, potentially obligating them to share shortages if Lower Basin supplies proved insufficient.[108] In practice, the clause has forced the federal government to act as both mediator and guarantor—

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104. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(c) (1928).

105. *See* BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, SR3-12 (2012) ("Previous studies of the Colorado River Basin reveal that water supply and demand imbalances have been on the radar since the 1960s.").

106. Charles J. Meyers & Richard L. Noble, *The Colorado River: The Treaty with Mexico*, 19 STAN. L. REV. 367, 378 (1967) (anticipating the federal government's role in ensuring Treaty compliance).

107. *See id.* at 405.

108. *See* Joe Gelt, *Sharing Colorado River Water: History, Public Policy and the Colorado River Compact*, 10 ARROYO 1, 11 (1997), https://wrrc.arizona.edu/publication/sharing-colorado-river-water-history-public-policy-and-colorado-river-compact [https://perma.cc/M5UY-3QKE] ("The compact directs the Upper Basin states to deliver 75 maf in any ten-year period to the Lower Basin states . . . . In the event of a severe drought, the Upper Basin states might need to curtail water use to fulfill their delivery obligation.").

balancing international commitments, interstate allocations, and the Secretary of the Interior's contract obligations. This federal supremacy and responsibility, first announced in *Arizona v. California*, was codified and expanded in the CRBPA.

Despite the remaining contestations and fears over the implementation of the "national obligation," the history and development of the term make its meaning clear, if not necessarily its application. During hearings on the CRBPA, Upper Basin representatives repeatedly pressed Congress to clarify that the Treaty obligation would not be satisfied solely from Upper Basin deliveries. Floyd Bishop, a state engineer from Wyoming dismissed the idea that a national obligation under the Mexican Treaty should increase the Upper Basin's water obligation in the future: "we do not agree that the Upper Basin has any obligation to deliver water to fulfill the Mexican Treaty Burden," but recognized that "such a burden may ultimately be thrust upon us."[109] Arizona, meanwhile, worried that California would insist on charging the Treaty obligation entirely against Lower Basin allocations, thereby threatening Arizona's newly authorized CAP. Senator Carl Hayden argued that without congressional clarification, Mexico's treaty water could come entirely at Arizona's expense, rendering the Central Arizona Project meaningless.[110]

Congress ultimately sought to break this impasse by declaring Treaty deliveries to be the "national obligation" of the United States. Legislative history reveals that "[t]he terms of H.R. 3300 make it clear that the Colorado River Basin States will be relieved of any obligation to reduce their uses in order to supply the water requirements of the Treaty."[111]

The legislative record thus demonstrates a conscious choice and a clear meaning: Congress sought to elevate Treaty compliance to a federal responsibility, even if this required overriding the parochial interests of individual Basin states. Yet the "national obligation" clause did not specify how the United States would, in practice, fulfill its responsibility. The legislative history of CRBPA § 301(b) reflects a compromise forged under extraordinary political pressure. It reassured Arizona that the CAP would not be sacrificed to Mexican deliveries, comforted the Upper Basin that Lee Ferry deliveries would not alone bear the burden, and placated California by leaving intact its 4.4 MAF entitlement.[112] Yet by leaving implementation

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109. *Colorado River Basin Project: Hearings Before the H. Subcomm. on Irrigation and Reclamation of the Comm. on Interior and Insular Affairs on H.R. 3300 and Similar Bills to Authorize the Construction, Operation, and Maintenance of the Colo. River Basin Project, and for Other Purposes*, 90th Cong. 395 (1967) (statement of Floyd A. Bishop).

110. *See id.* at 202 (recited statement of Sen. Carl Hayden).

111. H.R. Rep. No. 90-1312, at 3668 (1968).

112. *See id.* at 3667–69.

undefined, Congress guaranteed that the "national obligation" would remain a flashpoint in federal–state relations for decades to come.

But policymakers, negotiators, judges, and attorneys should not confuse uncertainty about implementation with vagueness as to meaning. Given its plain meaning as elaborated in the legislative history, the phrase "national obligation" is no mere rhetorical assurance without operational consequences. It is a genuine mandate redistribution of risk, ensuring that no single state, basin, or user bear a disproportionate burden in the satisfaction of Mexico's Treaty right, and obligating the United States invest and plan to protect state entitlements even in times of shortages while still honoring its promise to Mexico.

The "national obligation" language in § 301(b) of the CRBPA reflects not only a clear articulation of legislative intent regarding how risks and burdens are allocated across the basin, but also the relative priority of the Mexican Treaty right and its place within the U.S. federal structure. The 1944 Water Treaty is a binding international agreement, ratified by the Senate and carrying the force of federal law under the Supremacy Clause.[113] Under the Supremacy Clause, treaties made under the authority of the United States are the "supreme Law of the Land," displacing inconsistent state law.[114] Federal courts have consistently affirmed the supremacy of treaty obligations over conflicting state claims. In *Hauenstein v. Lynham*, the Court described treaties as obligations of the highest character, enforceable even absent implementing legislation.[115] In *United States v. Pink*, the Court underscored that "[p]ower over external affairs is not shared by the States; it is vested in the national government exclusively."[116] The question, therefore, is not whether the Treaty must be honored, but how its terms interact with the rest of the Law of the River.

Applied to the Colorado River, this principle means not only that the federal government carries a responsibility to Mexico that it cannot shift onto any one state or basin, but also that no state can lawfully obstruct the United States' obligation to deliver 1.5 MAF annually to Mexico under the 1944 Treaty, regardless of state water rights laws. Thus, no state or basin can deny

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113. Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Mex-U.S., Feb 3, 1944, 59 Stat. 1219; U.S. Const. art. VI, cl. 2.

114. U.S. Const. art. VI, cl. 2; *see also* Missouri v. Holland, 252 U.S. 416, 433–35 (1920) (upholding the federal government's treaty power even against Tenth Amendment challenges, reasoning that international commitments may reach subjects otherwise within state authority).

115. *See* 100 U.S. 483, 488–89 (1879) ("The efficacy of the treaty is declared and guaranteed by the Constitution of the United States . . . . A treaty cannot be the supreme law of the land, that is, of all the United States, if any act of a State legislature can stand in its way.").

116. 315 U.S. 203, 233 (1942).

or obstruct Mexico's right, and the burden of that right would not be imposed on any single basin, state, or project. Instead, the United States as a whole would stand behind the Treaty, consistent with federal constitutional supremacy.

Despite the clarity afforded by the "national obligation" language of the CRBPA, the same tensions that required that statutory clarification in 1968 have reemerged in the era of climate change, drought, increasing demand, and declining storage in Lakes Powell and Mead. The "national obligation" clause continues to shape negotiations over shortage-sharing agreements and binational cooperation through IBWC Minutes. Arizona's reliance on the CAP makes it particularly sensitive to how the clause is interpreted—whether as a true federal guarantee or as a hollow promise that collapses in times of scarcity.

While Article III(c) of the Compact makes clear that the burden to supply Mexico's right "shall be equally borne" between the Upper and Lower Basin, the "national obligation" language of the CRBPA clarifies that neither basin will disproportionately bear the burden, nor can either escape its share, but both must be able to depend on the federal government.

The CRBPA's "national obligation" language thus relieves the Upper Basin and Arizona of bearing a disproportionate burden in satisfying the Mexican Treaty right. By declaring the Mexican Treaty a national obligation, Congress elevated international law above state allocations, while leaving unresolved the precise mechanisms of burden-sharing between Basins and how the federal government could assume that burden. The resolution to these tensions and questions created by the "national obligation" language in the CRBPA can be resolved by looking to another contested term in that statute—"augmentation."

C. The Role of "Augmentation".

The recognition of the Water Treaty delivery as a "national obligation" in CRBPA § 301(b) resolves who does (and perhaps more importantly, who does not solely) bear responsibility to satisfy Mexico's rights to the Colorado River. But it does not obviously resolve how such satisfaction can be a national obligation. The absence of a clear statutory formula has meant that the task of "operationalizing" the national obligation has fallen to a combination of federal administrative discretion and negotiated shortage criteria.

The Supreme Court in *Arizona v. California* had already established that, despite the constitutional risks associated with the delegation of such broad powers, the Secretary of the Interior wields plenary authority to contract for

and allocate mainstream water under the BCPA, particularly in times of shortage.[117] That same logic applies to Treaty compliance: as operator of Hoover Dam and Imperial Dam, the Secretary must ensure that sufficient water is delivered to Mexico at Morelos Dam in accordance with Treaty requirements.[118] When this plenary authority is combined with the CRPBA language regarding a "national obligation," the leader and responsible party for honoring Mexico's right without disproportionately burdening any one basin, state, or user is the U.S. federal government.

The most consequential and, perhaps, controversial way the national obligation has been operationalized by the federal government is through the subordination of the CAP water rights to both California's 4.4 MAF/y entitlement and to Treaty deliveries. Section 301(a) of the CRBPA provides that CAP water is junior to "present perfected rights" in the Lower Basin, a phrase understood to include California's mainstream allocations as of 1929.[119] This junior priority has certainly informed shortage sharing policy over the last two decades. The U.S. Department of the Interior's 2007 Interim Shortage Sharing Guidelines base reductions on the elevation of Lake Mead, and those reductions come principally from CAP and never from California.[120] With the advent of the 2019 Lower Basin Drought Contingency Plan, this has changed, with California agreeing to reductions under certain shortage conditions based on the elevation of Lake Mead.[121]

The problem with this arrangement is that it honors one aspect of the CRBPA (the CAP's junior priority relative to California), while violating another (the "national obligation") by compelling Arizona (and more specifically the subcontractors of the CAP) to bear the brunt of satisfying the Water Treaty commitment to Mexico. For Arizona, this outcome represents a bitter irony: the very statute that authorized the CAP and placed the responsibility toward Mexico on the national as a whole also entrenched the CAP's vulnerability to curtailment, to assure California and the Upper Basin that the Treaty burden would not fall upon them.

How can the two aspects of the CRPBA (the CAP's junior priority and the "national obligation") be reconciled? The answer is greater emphasis on, and

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117. 373 U.S. 546, 580–81 (1963).

118. *Id.* at 587–88.

119. Jonathan R. Schutz, *Present Perfected Rights: The Most Senior Undefined Water Rights on the Colorado River*, 16 U. DENVER WATER L. REV. 381, 383 (2013).

120. Record of Decision, Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, 73 Fed. Reg. 19873-01 (Apr. 11, 2008).

121. Colorado River Drought Contingency Plan Authorization Act, Pub. L. No. 116-14, 133 Stat. 850 (2019); CHARLES V. STERN, CONG. RSCH. SERV., IN10984, DROUGHT CONTINGENCY PLANS FOR THE COLORADO RIVER BASIN 4–5 (2019).

recommitment toward implementing, the provisions of the CRBPA calling for federal investments in augmentation. Indeed, "augmentation" and the "national obligation" are explicitly connected in the CRBPA § 202: "The Congress declares that the satisfaction of the requirement of the Mexican Water Treaty from the Colorado River constitutes a *national obligation* which shall be the first obligation of any water *augmentation* project planned pursuant to . . . this Act."[122]

Under Article III(c) of the Compact, the Mexican Treaty right was to be satisfied first from surplus if available, and if unavailable, then the burden to satisfy Mexico "shall be equally borne" by both the Upper and Lower Basins.[123] The CRBPA, however, provides that the Basin States

> shall be relieved from all obligations which may have been imposed upon them by article III(c) of the [Compact] so long as the Secretary shall determine and proclaim that means are available and in operation which augment the water supply of the Colorado River system in such quantity as to satisfy the requirements of the Mexican Water Treaty.[124]

The CRBPA defines "augment" or "augmentation" broadly to mean "increase the supply of the Colorado River or its tributaries by the introduction of water into the Colorado River system, which is in addition to the natural supply of the system."[125] Both augmentation and water imports would require federal funding and raise questions of state contributions or reimbursements and whether such requirements fit within meaning of "national obligation."

The CRBPA includes language authorizing future studies of augmentation, reflecting congressional recognition that the river's native supply was insufficient to satisfy all claims.[126] This is evident in the legislative history of the CRBPA. For example, the House Committee on Interior and Insular Affairs (the "HCIIA") noted that the Compact and the Water Treaty created inequities that the CRBPA aimed to address, including the expectation in 1922 and 1944 that surplus waters would be consistently available to satisfy Mexico's right and the use of Lake Mead storage to meet

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122. Colorado River Basin Project Act of 1968, Pub. L. No. 90-537, § 202, 82 Stat. 885, 887 (1968) (codified as amended at 43 U.S.C. §§ 1501–1556) (emphasis added).

123. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(c) (1928).

124. Colorado River Basin Project Act § 202.

125. *Id.* § 606.

126. *Id.* § 202 (directing the Secretary to investigate augmentation "of the water supply of the Colorado River system").

delivery obligations to Mexico despite that not being a planned or stated purpose of Lake Mead.[127]

The HCIIA further noted that the simultaneous negotiation of rights along the Colorado and Rio Grande rivers may have prejudiced U.S. Colorado River users, and that the 1944 Water Treaty failed to account for hydraulic head required, and evapotranspiration lost, in the delivery of 1.5 MAF/y to Mexico.[128] The HCIIA stated that "[t]he Treaty was entered into by the United States on behalf of all its citizens. The benefits of the Treaty are national in character, and should not have to be met by the sacrifices of water of the seven Colorado River Basin States."[129] Of the "national obligation" in the CRBPA, Senator Kuchel of California states that the obligation recognized "that when the Senate ratified that commitment it did so on behalf of the American people and not just the Colorado River Basin States. Therefore, to provide that water in the future without damaging any of the Colorado River States, the Federal Government should pay an amount equivalent to that portion."[130] The mechanism to place this national obligation on the shoulders of the federal government without prejudicing the states of the Colorado River is federally funded augmentation.

Proposals for such augmentation ranged from importing water from the Mississippi or Columbia Rivers to large-scale desalination of seawater in the Gulf of California.[131] In practice, only one major federal augmentation project was ever realized: the Yuma Desalting Plant, authorized under the Colorado River Basin Salinity Control Act of 1974 to reduce salinity in waters delivered to Mexico.[132] However, as noted above, that plant rarely operates and the water is largely discharged to the Cienega de la Santa Clara wetlands in Mexico. The failure to implement a broad federally funded and implemented water augmentation program in the Colorado River Basin means that the "national obligation" has, in practice, been absorbed within the rapidly diminishing Colorado River supply—aggravating the zero-sum competition between Arizona and California over the CAP, and between the Upper Basin and Lower Basin over delivery obligations at Lee Ferry.

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127. H.R. Rep. No. 1312 (1968), *as reprinted in* 1968 U.S.C.C.A.N. 3666, 3693–94.

128. *Id.* at 3696.

129. *Id.* at 3697–98.

130. *Colorado River Basin Project: Hearings Before the H. Subcomm. on Irrigation and Reclamation of the Comm. on Interior and Insular Affs. on H.R. 3300 and Similar Bills to Authorize the Construction, Operation, and Maintenance of the Colorado River Basin Project, and for Other Purposes*, 90th Cong. 164 (1967) (statement of Sen. Thomas Kuchel).

131. HUNDLEY, *supra* note 38, at 334–36.

132. Colorado River Basin Salinity Control Act, Pub. L. No. 93-320, 88 Stat. 266 (1974).

The Upper Basin feared that the national obligation could be interpreted to require greater Lee Ferry deliveries to secure Treaty compliance. Article III(d) of the Compact obligates the Upper Basin to deliver 75 MAF over any consecutive ten-year period, a duty that has become increasingly difficult in the face of declining runoff and climate change.[133] With decreasing supplies, neither basin can rely on surplus to satisfy the Mexican Treaty right, meaning that burden is "equally borne" by both basins under Article III(c) of the Compact.[134] That burden arguably includes not only half of the 1.5 MAF/y guaranteed to Mexico due by the Upper Basin, but also must account for half of the water lost to evapotranspiration.

For Arizona, the final report on the CRBPA stated that federal augmentation was necessary to avoid giving Arizona false hope in its reliance on the CAP.[135] The CRBPA was intended to make the CAP a reliable water source going forward, despite the risks it codifies as CAP's junior priority. That junior priority only persists so long as augmentation projects fails to satisfy the national obligation to Mexico. Under § 301(c) of the CRBPA, CAP's junior priority under § 301(b) does not apply once the Secretary of the Interior determines that augmentation meets the national obligation to Mexico.[136] But so long as augmentation remains insufficient to satisfy that obligation, the CAP operates (and Arizona negotiates) under the cloud of California's senior priority.

Thus, the national obligation, without augmentation, has been implemented to reinforce the Compact baseline that results in so much content – Upper Basin delivery obligations at Lee Ferry with shortage in the Lower Basin absorbed by CAP. This is hardly a "national obligation" in practice, and it is difficult to see how to make it a national obligation without federal augmentation. In short, while the "national obligation" was designed to transcend interstate conflict, its practical implementation without the augmentation called for by the CRBPA has only reinforced those conflicts, leaving the Basin states to scramble for an elusive consensus without the promised federal resources.

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133. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(d) (1928); *see also* Bradley Udall & Jonathan Overpeck, *The Twenty-First Century Colorado River Hot Drought and Implications for the Future*, 53 WATER RES. RSCH. 2404, 2405–07 (2017).

134. Colorado River Compact, Nov. 24, 1922, 70 CONG. REC. 324, art. III(c) (1928).

135. HAROLD T. JOHNSON, COLORADO RIVER BASIN PROJECT, H.R. REP. NO. 1312, at 41 (1968).

136. Colorado River Basin Project Act of 1968, Pub. L. No. 90-537, § 301, 82 Stat. 885, 888 (codified as amended at 43 U.S.C. §§ 1501–1556).

III. AUGMENTATION AND THE NATIONAL OBLIGATION

The importance of augmentation as the means of meeting the national obligation to Mexico still requires an understanding of which projects fall within the meaning of "augmentation." The CRBPA defines "augment" or "augmentation" to mean "increase the supply of the Colorado River or its tributaries by the introduction of water into the Colorado River system, which is in addition to the natural supply of the system."[137] The term thus clearly contemplates new water supplies, like desalination or bulk water imports. Indeed, in the negotiations leading up the enactment of the CRBPA, Secretary Udall identified desalination and water imports from Northern California and the Columbia River as possible augmentation projects.[138]

However, the plenary authority of the Secretary of the Interior recognized in *Arizona v. California*, combined with the authority of the Secretary under the CRBPA to "determine and proclaim" that an augmentation project satisfies the Mexican Treaty right perhaps expands the term to encompass other strategies, including water conservation or recycling projects. Whether or not a particular project qualifies as "augmentation" for purposes of the CRBPA, addressing the CAP's priority, and satisfying the Mexican Treaty right may hinge on whether the meaning of "augmentation" can be best understood in the distinction water law makes between "developed water" and "salvaged water."

The world is like a golf ball—it's a large sphere covered in divots. Each divot is a catchment, or river basin, within which all water drains to a common point. Developed water is water imported from one basin into another – like bulk water imports or ocean desalination.[139] Salvaged water is inaccessible or unusable water that is already within the basin but is made usable by human intervention.[140] For example, an advanced well drilling could access deep fossil groundwater, or treatment technology could clean contaminated water to make it usable.

Under western water law, developed water is generally owned by whoever develops it, independent of the prior appropriation system.[141] Prior appropriation, on the other hand, still applies to salvaged water. Thus, the party that salvaged the water has no superior claim to the water despite their

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137. *Id.* § 606.

138. MILTON N. NATHANSON, U.S. DEP'T OF INTERIOR, BUREAU OF RECLAMATION, UPDATING THE HOOVER DAM DOCUMENTS 195, 202 (1978).

139. Rhett Larson, *Augmented Water Law*, 48 TEX. TECH L. REV. 757, 766 (2016).

140. *Id*.

141. *Id*.

investment.[142] For example, in *Southeastern Colorado Water Conservancy District v. Shelton Farms*, the court held that someone who removed invasive species from a river bank had no priority to claim any increased water supply resulting from that work, because such augmented supplies are salvaged water.[143] Some studies related to the CRBP have explored weather modification as a possible source of augmentation.[144] However, one of the reasons why weather modification technologies, like cloud seeding, have not been widely implemented in the western U.S. is the uncertain status of those increased supplies—is that rain developed water that belongs to people investing in cloud seeding, or salvaged water that enters the prior appropriation system with little direct return to those investors?[145]

The distinction between developed and salvaged water is potentially relevant to augmentation to satisfy the national obligation if "augmentation" under the CRBPA is limited to mean only developed water. Under the CRBPA, "augmentation" means to "increase the supply of the Colorado River or its tributaries by the introduction of water into the Colorado River system, which is in addition to the natural supply of the system."[146] If viewed narrowly, this definition is limited only to developed water. That would limit augmentation strategies that could alleviate the CAP from junior priority and decrease the delivery obligation on the Upper Basin only to more expensive, controversial, and complicated projects with longer time horizons, like desalination or bulk water imports. If the CRBPA's definition of "augmentation" can be interpreted more broadly to encompass salvaged water, then projects such as conservation or recycling could be implemented more quickly and with less expense, accelerating the efforts to make Mexico's Treaty right a true national obligation through federally funded augmentation projects.

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142. *Id*.

143. *See* Se. Colo. Water Conservancy Dist. v. Sheldon Farms, Inc., 529 P.2d 1321, 1327 (Colo. 1974) ("Withdrawal of water must be orderly, and to be orderly it must come under the priority system.").

144. COLORADO RIVER BASIN STAKEHOLDERS, MOVING FORWARD TO ADDRESS CHALLENGES IDENTIFIED IN THE COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, PHASE 1 REPORT: A PRODUCT OF THE MOVING FORWARD EFFORT 2-3 to 2-5 (2015) [hereinafter PHASE 1 REPORT], https://www.usbr.gov/lc/region/programs/crbstudy/MovingForward/Phase1Report/fullreport.pdf [https://perma.cc/N9AS-FT6Y].

145. Larson, *supra* note 139, at 765–75.

146. Colorado River Basin Project Act of 1968, Pub. L. No. 90-537, § 606, 82 Stat. 885, 901 (codified as amended at 43 U.S.C. §§ 1501–1556).

A. Conservation and Recycling as Augmentation

At first glance, the definition of "augmentation" under the CRBPA as the "introduction of water" into the Colorado River system seems to exclude water conservation of recycling as augmentation strategies intended to address the national obligation to Mexico. Conservation and recycling seem more akin to salvaged water—already part of the basin but made more accessible through technology. However, conservation and recycling can and should be considered within the CRBPA's definition of augmentation for four reasons.

First, recycling and conservation can arguably fit within the broad definition in the statute. There is nothing in the CRBPA or the Law of the River more generally that necessarily compels the equation of "augmentation" with "developed water." The CRBPA does not define "introduction" in the statute. Black's Law Dictionary defines "introduction" to mean "the act of bringing something in or causing it to be present in a place or context."[147] The CRBPA also expands on the idea of "introduction" by noting that includes the "addition to the natural supply of the system."[148] Recycled water or conserved water brings that water or causes that water to be present in a new place or context, and though it was subtracted from the natural supply of the system, it can be "introduced" back as an addition.

Second, the plenary power of the Secretary of the Interior under *Arizona v. California* gives the Secretary broad authority to manage the Colorado River System.[149] If there is any aspect of the Law of the River in which that broad authority might be welcomed in its most expansive form, it is in recognizing conservation and recycling as augmentation. The Secretary can use that plenary authority to "determine and proclaim" under the CRBPA that certain conservation and recycling projects qualify as augmentation as part of a national obligation to Mexico.[150] Of course, that is perhaps short of the broad authority that Justice Harlan warned presented a grave constitutional concern.[151] But to encourage more federal investment in water conservation, and to make the delivery responsibility to Mexico a true national obligation quickly and efficiently, the benefits of an expansive definition of augmentation may outweigh the risks.

Third, the Secretary should rely on that power, and the openness of the interpretation of "introduction" and "addition" to include recycling and

147. *Introduction*, BLACK'S LAW DICTIONARY (11th ed. 2019).
148. Colorado River Basin Project Act § 606.
149. Arizona v. California, 373 U.S. 546, 580–81 (1963).
150. Colorado River Basin Project Act § 202.
151. Arizona v. California, 373 U.S. at 626 (Harlan, J., dissenting in part).

conservation as augmentation for practical reasons. Recycling and conservation projects are already underway and are far more cost effective than any new large-scale desalination or bulk water import project.[152] In 1975, the Department of the Interior published a report on the relative costs and benefits of various augmentation strategies. The report found that total basin demand would exceed natural flow around the time the CAP was completed, and that augmentation would be necessary. But most augmentation strategies at that time, including desalination and weather modification, were prohibitively expensive when compared to conservation.[153] Direct potable reuse, or advanced water purification, systems for recycling wastewater to drinking water are already in development in Arizona and California with support from the federal government.[154] The federal government is funding conservation projects within the basin, including canal lining and improved irrigation technologies.[155]

By declaring and proclaiming recycling and conservation projects to be "augmentation" to meet the national obligation to Mexico, the Secretary of the Interior could move quickly and cost-effectively in satisfying that obligation, while encouraging investments in conservation and recycling. The risk of this approach is that many conservation and recycling efforts made to adapt to reduced supplies would be characterized as aimed to satisfy Mexico. It could be seen as simply reclassifying projects without making meaningful gains in increasing available supplies. But there is perhaps a bigger risk in declining to view the most cost-effective and expeditious means to address water shortfalls as anything other than augmentation.

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152. *See generally* SUSTAINABLE WATER FOR THE FUTURE: WATER RECYCLING VERSUS DESALINATION (Isabel C. Escobar & Andrea Schäfer eds., Elsevier 2009).

153. See U.S. DEP'T OF INTERIOR, CRITICAL WATER PROBLEMS FACING THE ELEVEN WESTERN STATES 154 (1975) [hereinafter WESTWIDE STUDY], available at https://upload.wikimedia.org/wikipedia/commons/b/be/Westwide_study_report_on_critical_water_problems_facing_the_eleven_Western_States._%28IA_westwidestudyrep00unse%29.pdf [https://perma.cc/5AX4-RY3C].

154. *See* Ian James, *California Prepares to Transform Sewage into Pure Drinking Water Under New Rules*, L.A. TIMES (Dec. 17, 2023), https://www.aol.com/news/california-prepares-transform-sewage-pure-110041473.html [https://perma.cc/5V6Z-MB26]; Erin Young & Rob McCandless, Opinion, *Arizona's Drinking Water Is About to Change for the Better*, AZCENTRAL (Mar. 5, 2025), https://www.azcentral.com/story/opinion/op-ed/2025/03/03/arizona-advanced-water-purification-recycling-supply/80839759007/?gnt-cfr=1&gca-cat=p&gca-uir=false&gca-epti=z114535p004850c004850u116335e003500v114535&gca-ft=204&gca-ds=sophi [https://perma.cc/H9EK-R8V4].

155. Annie Snider, *Colorado River Deal Opens Cash Spigot for Big Farms*, POLITICO (Nov. 27, 2023), https://www.politico.com/news/2023/11/25/biden-climate-cash-water-costs-00128595 [https://perma.cc/R422-ZQZK].

Fourth, conservation and recycling have already been effectively accepted as augmentation within the meaning contemplated by the CRBPA as evidenced by the funding of the Yuma Desalting Plant. The Yuma Desalinating Plant was approved and funded by the federal government as part of satisfying a commitment to Mexico. It has been specifically cited as an example of potential augmentation by the U.S. Bureau of Reclamation.[156] If desalinating the Colorado River itself qualifies as "augmentation," then purifying wastewater or conserving those flows should logically qualify as augmentation as well. Of course, the Yuma Desalting Plant is perhaps not the best example, as it has largely fallen into disuse. But the fact that one form of treatment and conservation is expensive is no reason to not invest in other efficient and effective technologies.

There are myriad possible approaches to use recycling and conservation projects to add up to the delivery obligation to Mexico through federal funding. One possible approach would be increased federal funding for watershed management in federal forests. Removal of scrub brush and invasive species can mitigate wildfire risks while at the same time augmenting supplies. Much of this scrub brush is too narrow in diameter for commercial lumber purposes, so federal funding on federal land is all the more critical for sustainable management and increased supplies that could form part of an overall augmentation strategy, broadly defined. There is already some precedent for this in the successful, but limited due to costs, Four Forest Restoration Initiative in Arizona.[157] In addition to watershed management, the federal government could continue to support direct potable reuse projects, retrofit the Yuma Desalting Plan to recycle agricultural runoff to other beneficial uses, invest in canal lining, smart gates, laser leveling, and drip irrigation for farms, fund smart meters to address water loss through leaks in urban areas, fund the construction of solar panel coverings for canals, and support farmers shifting to more water efficient crops. Each of these efforts collectively, if characterized as augmentation, could help satisfy the national obligation to Mexico.

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156. PHASE 1 REPORT, *supra* note 144.

157. *Four Forest Restorative Initiative*, U.S. DEP'T OF AGRIC. (Sept. 9, 2025), https://www.fs.usda.gov/r03/natural-resources/forest-management/four-forest-restoration-initiative [https://perma.cc/6MTC-D7W5].

B. Bulk Water Inter-Basin Imports as Augmentation

The potential to import water into the Colorado River Basin has been proposed in various forms for decades.[158] These proposals have included importing water from the Columbia River Basin and from Northern California.[159] Bulk water transfers have a certain simple logic. There are places with abundant water and places with insufficient water. Why not allow the wet place to sell water to the dry place? It's no different than oil or timber or gold. Despite this apparently simple logic, bulk water transfer into the Colorado River Basin have met serious opposition, so much so that the CRBPA includes a provision prohibiting studies on the importation of surface water from outside of the Basin for ten years after its enactment.[160] The CRBPA also provided that any efforts undertaken by the Secretary of the Interior to import water from outside the Basin "make provision for adequate and equitable protection of the interests of the States and areas of origin."[161]

Opponents of such bulk water imports raise several objections. First, water is heavy, making the cost of its transport high enough that local water sources will always be preferred due to cost.[162] However, technological innovations could reduce these costs.[163] Desalination in San Diego could cost nearly $5 per cubic meter, whereas transport of water from Alaska via towed bag technology could be less than half that cost.[164] Still, this comparison is to the most expensive type of local water – seawater desalination – that is not available to many inland regions. Other local water sources will likely remain less expensive than bulk imports.

Second, local water users object to exports out of concern for local economies and ecosystems.[165] Such concerns are particularly acute for inter-basin transfers.[166] Even apparently "wet" places experience extreme

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158. NATHANSON, *supra* note 138, at 202.

159. *Id.*; *see also* WESTWIDE STUDY, *supra* note 153.

160. Colorado River Basin Project Act of 1968, Pub. L. No. 90-537, § 201, 82 Stat. 886 (codified as amended at 43 U.S.C. §§ 1501–1556).

161. *Id.* § 203(a).

162. Cynthia DeLaughter, *Priming the Water Industry Pump*, 37 HOUS. L. REV. 1465, 1491 (2000).

163. Andrew Hodges et al., *The Economics of Bulk Water Transport in Southern California*, 3 RESOURCES 703, 709 (2014).

164. *Id.*

165. Larson, *supra* note 139, at 770–71.

166. Noah D. Hall & Benjamin L. Cavataro, *Interstate Groundwater Law in the Snake Valley: Equitable Apportionment and a New Model for Transboundary Aquifer Management*, 2013 UTAH L. REV. 1553, 1574; *see also* Kirt Mayland, *Navigating the Murky Waters of Connecticut's Water Allocation Scheme*, 24 QUINNIPIAC L. REV. 685, 685 (2006).

droughts.[167] Even the Great Lakes are effectively a non-renewable resource, as less than one percent of the lakes' water is recharged each year by precipitation.[168]

Third, the importing regions have concerns over dependence upon the exporting region for their water supply, and the environmental costs and risks of importation.[169] The importing region may have concerns over water quality or importing invasive species or pathogens with the bulk water.[170] For example, Singapore has moved to expand desalination and wastewater recycling to eliminate its dependence upon bulk water imports from neighboring Malaysia.[171]

Fourth, bulk water transfers have many logistical obstacles, in terms of securing land rights and rights-of-way for pipelines.[172] Of course, a common refrain in water policy is that water does not flow downhill; it flows to money. Money may overcome these kinds of obstacles. However, there must be a market for water that is expensive at the delivery end of the pipeline. In the end, the reason there are pipelines for oil and gas but not water is that people will not pay for water what they pay for oil and gas. As long as that remains true, the logistical obstacles to inter-basin water pipelines may remain insurmountable.

Fifth, there are meaningful legal and political obstacles. If the proposed transfer is from an eastern region that has a riparian water rights regime, then the transfer will almost certainly be considered unreasonable and unlawful. Under riparian water rights regimes, the owner of land that directly abuts a natural watercourse has the right to take a reasonable amount of water from that watercourse.[173] Inter-basin transfers of water are generally presumed unreasonable.[174] Thus, any attempt to export water from the Great Lakes or the Mississippi River, for example, would likely face very strong claims that such transfers are unreasonable. As for transfers from the Columbia River

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167. Adriana Pérez, *Water Levels on the Mississippi River Are Low. That's Raising Concerns for Illinois Farmers During the Harvest*, CHI. TRIB. (Sept. 22, 2024), https://www.chicagotribune.com/2024/09/22/mississippi-river-drought-harvest-illinois/.

168. INT'L JOINT COMM'N, PROTECTION OF THE WATERS OF THE GREAT LAKES, FINAL REPORT 6 (2000).

169. Larson, *supra* note 139, at 771.

170. *See, e.g.*, Tony G. Puthucherril, *Ballast Waters and Aquatic Invasive Species: A Model for India*, 19 COLO. J. INT'L ENV'T L. & POL'Y 381 (2008).

171. Larson, *supra* note 139, at 760.

172. *See, e.g.*, *Easement Acquisition*, N. WATER, https://www.northernwater.org/NISP/delivery-pipeline/easement-acquisition [https://perma.cc/D2P2-J73Q] (Nov. 2, 2025).

173. *See generally* Robert Abrams, *Interbasin Transfer in a Riparian Jurisdiction*, 24 WM. & MARY L. REV. 591 (1983).

174. *Id.*

Basin or Northern California, the acquisition of prior appropriation surface water rights would be expensive and include a complex and controversial sever and transfer process that would almost certainly face litigation in opposition.[175]

Besides the legal obstacles, the exporting regions would almost certainly raise significant political opposition in many cases. There have been multiple attempts over the years to pursue bulk water export projects from Canada, and each has met significant political opposition.[176] When it comes to buying and selling water, particularly between political jurisdictions, it is best not to assume much rationality. Water is certainly a valuable, saleable commodity like coal, oil, or uranium. But it is also a political and cultural symbol. We don't throw lumps of coal at each other in the winter, and we don't squirt each other with oil in the summer, and we don't baptize people in uranium. Water is a symbol, and often a political symbol of sovereignty. That symbolic value is likely to pose a significant obstacle to any inter-jurisdictional bulk water transfer.

Some proponents of bulk water transfers suggest a system whereby only stormwater or water during highly wet years is transferred to the Colorado River Basin.[177] However, this proposal does not necessarily overcome the logistical, legal, or political obstacles mentioned above. Additionally, water managers prefer predictable, reliable supplies when planning and investing in infrastructure, rather than a sudden and unpredictable influx based on remote weather patterns.

C. Desalination as Augmentation

Desalination has consistently been cited in studies as a possible augmentation approach to satisfy the Mexican Treaty right.[178] Most proposals have focused on membrane filtration desalination associated with seawater or brackish groundwater.[179] Membrane treatment requires either a pressure gradient or an electrically charged gradient to move water or salt ions through

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175. *See generally* Clifford J. Villa, *California Dreaming: Water Transfers from the Pacific Northwest*, 23 ENV'T L. 997 (1993).

176. Larson, *supra* note 139, at 760.

177. Karl Kohlhoff & David Robert, *Beyond the Colorado River: Is an International Water Augmentation Consortium in Arizona's Future*, 49 ARIZ. L. REV. 257, 280 (2007).

178. PHASE 1 REPORT, *supra* note 144, at 3C-2, 3C-4; *see also* WESTSIDE STUDY, *supra* note 153, at 154, 181.

179. PHASE 1 REPORT, *supra* note 144, at 3C-2, 3C-4; *see also* WESTSIDE STUDY, *supra* note 153, at 181, 223.

a membrane, thereby separating salt from water.[180] Desalination has potential negative environmental impacts associated with high energy consumption and the disposal of brine wastes.[181] Environmental impacts from desalination may include contamination from brine waste disposal, handling and disposal of water treatment or membrane cleaning chemicals, ecological degradation due to intake of saline water, and greenhouse gas emissions associated with energy consumption.[182] Desalination's environmental impacts and the cost to avoid or mitigate those impacts pose obstacles to responsibly implementing the technology.[183] However, such environmental costs only aggravate the more fundamental barrier to implementing desalination, which is financial feasibility, largely driven by energy costs.

The energy costs associated with desalination have historically been so high as to effectively limit the use of desalination to only those extremely water-poor but extremely energy-rich nations, such as Saudi Arabia.[184] The studies conducted in the wake of the enactment of the CRBPA concluded that desalination was prohibitively expensive.[185] However, recent technological advances have significantly decreased the costs and energy demands associated with desalination. Photovoltaic solar cells have been integrated into desalination operations to lower energy costs and reduce greenhouse gas emissions.[186] Pressure transfer systems conserve energy by recycling pressure in brine waste streams into the production stream to drive salt water through membranes. [187] Additionally, co-location strategies to build desalination plants near wastewater treatment plants and power plants have significantly

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180. *See generally* Tamim Younos & Kimberly E. Tulou, *Overview of Desalination Techniques*, 132 J. CONTEMP. WATER RSCH. & EDUC. 3 (2005).

181. *See generally* Sabine Lattemann & Thomas Höpner, *Environmental Impact and Impact Assessment of Seawater Desalination*, 220 DESALINATION 1 (2008).

182. *See generally* G.L. Meerganz von Medeazza, *'Direct' and Socially-Induced Environmental Impacts of Desalination*, 185 DESALINATION 57 (2005).

183. *See, e.g.*, Robert L. Campbell & Anthony T. Jones, *Appropriate Disposal of Effluent from Coastal Desalination Facilities*, 182 DESALINATION 365, 365–72 (2005).

184. *See generally* Walid A. Abderrahman, *Energy and Water in Arid Developing Countries: Saudi Arabia, A Case-Study*, 17 INT'L J. WATER RES. DEV. 247 (2010).

185. WESTWIDE Study, *supra* note 153, at 174–75.

186. Y.M. El-Sayed, *The Rising Potential of Competitive Solar Desalination*, 216 DESALINATION 314, 315 (2007); *see also* Young Mi Kim et al., *Overview of Systems Engineering Approaches for Large-Scale Seawater Desalination Plant with a Reverse Osmosis Network*, 238 DESALINATION 312, 318 (2009).

187. El-Sayed, *supra* note 186, at 317–19; *see also* Kim, *supra* note 186, at 318 (2009); *see also* Tomás Cazurra, *Water Reuse of South Barcelona's Wastewater Reclamation Plant*, 218 DESALINATION 43, 50–51 (2008).

reduced costs and environmental impacts associated with desalination.[188] In combination, these measures can significantly decrease desalination costs and environmental harms. When combined, these techniques have substantially reduced energy consumption from 25 kwH/m³ typical of desalination plants in the 1980s to approximately 2.5 kwH/ m³ today in some of the most efficient plants.[189]

Both brackish groundwater desalination and seawater desalination projects have been proposed as part of an augmentation to satisfy the Mexican Treaty right.[190] While seawater desalination is almost certainly augmentation as defined by the CRBPA and most analogous to developed water, brackish groundwater desalination could be seen as more akin to salvaged water, and like the Yuma Desalting Plant, less obviously "augmentation" in the traditional sense because it is only making water already within the basin more usable. However, as the U.S. Bureau of Reclamation's own studies and the federal government's own investments in the Yuma Desalting Plant suggest, inland desalination arguably can form part of the broader augmentation portfolio, consistent with the CRBPA. The advantages of brackish groundwater desalination are reduced transport costs, broader access to inland areas, and fewer environmental impacts.[191]

As for seawater desalination, California has already expanded its development of seawater desalination with its plant in Carlsbad. Even with a relatively new and relatively advanced plant, criticism has still been leveled at the cost and environmental impacts, and Southern California cities have moved more rapidly toward increased conservation measures and water recycling as less costly alternatives.[192] Nevertheless, Mexico continues to

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188. Nikolay Voutchkov, *Seawater Desalination Costs Cut Through Power Plant Co-Location*, 41 FILTRATION & SEPARATION 24–26 (2004); *see also* Robert R. Yamada et al., *Co-Located Seawater Desalination/Power Facilities: Practical and Institutional Issues*, 102 DESALINATION 279–86 (1995); Cazurra, *supra* note 187, at 50–51; Robin Kundis Craig, *Water Supply, Desalination, Climate Change, and Energy Policy*, 22 PAC. MCGEORGE GLOB. BUS. & DEV. L.J. 225, 251 (2010).

189. Rhett Larson, *Innovation and International Commons*, 2012 UTAH L. REV. 759, 766 (2012).

190. WESTWIDE STUDY, *supra* note 153, at 154.

191. *See generally* Val Frenkel, Presentation at the World Environmental and Water Resources Congress Conference: Brackish vs. Seawater Desalination: Which Is Most Cost-Effective? (May 2007).

192. Ian James, *Drought Boon or Boondoggle? Critics Blast Poseidon Desalination Plan as Crucial Vote Looms*, L.A. TIMES (Apr. 25, 2022), https://phys.org/news/2022-04-drought-boon-boondoggle-critics-blast.html [https://perma.cc/DSG5-FT7H]; Stephanie Elam, *As Water Runs Short in California, Commission Rejects $1.4 Billion Desalination Plant*, CNN (May 12, 2022), https://www.cnn.com/2022/05/12/us/california-water-desalinization-vote-drought-climate [https://perma.cc/37TQ-V32U].

invest in expanding seawater desalination.[193] Despite its costs and risks, desalination can help diversify the water supply portfolio while augmenting supplies. As for the costs, advanced water purification recycling systems are also expensive.[194] Ultimately, the Colorado River Basin is not running out of water. It is running out of cheap water. There are few cheap alternatives. For Arizona especially, the costs associated with augmentation should be considered in light of the potential that such augmentation, recognized by the federal government as aimed at satisfying the national obligation to Mexico, could relieve the CAP of its junior priority. As such, the costs of desalination should not be considered solely in comparison to cheaper demand management strategies but should also integrate the potential economic value of removing that cloud hovering over Arizona's water future.

As Mexico moves forward with desalination projects, the federal government should explore how it can assist in advancing those projects. A desalination plant in Mexico that pipes water to U.S. consumers makes little sense, given the already high costs of desalination combined with the transport costs. But a desalination plant supported by the U.S. (even if supported with the benefit of co-location facilities) in Mexico, with Mexico allowing some of its water to move through the CAP into Arizona, could present the right mix of benefits and acceptable costs. If such a desalination could be developed in a way that the brine reject stream could be used for dust suppression or refill in the Salton Sea to support California and the residents in the Imperial Valley, then augmentation becomes a more holistic management strategy.

One complicating aspect of seawater desalination is that it shifts the traditional power dynamic. Normally, it is better to be upstream with a shovel than downstream with a right. But the development of seawater desalination shifts some water supply, and the power that goes with it, from the mountains to the coast. This shift will impact, for better or for worse, the hydro-diplomatic relationship between the U.S. and Mexico.

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193. MND Staff, *Federal Government Announces 17 Water Infrastructure Projects Across Mexico*, MEX. DAILY NEWS (Mar. 12, 2025), https://mexiconewsdaily.com/news/mexico-water-projects/ [https://perma.cc/KLF3-7YML]; MND Staff, *Plans for Tijuana Desalination Plant Appear to Finally Be Moving Forward*, MEX. DAILY NEWS (Oct. 23, 2024), https://mexiconewsdaily.com/news/tijuana-water/ [https://perma.cc/G9Q2-43E5].

194. Shawn Raymundo, *Phoenix's Planned Water Purification Facility Gets $179M Federal Investment*, AZCENTRAL, https://www.azcentral.com/story/news/local/phoenix/2025/08/08/north-gateway-water-purification-facility-investment/85552019007/?gnt-cfr=1&gca-cat=p&gca-uir=true&gca-epti=undefined&gca-ft=0&gca-ds=sophi (Aug. 8, 2025).

IV. CONCLUSION

The "national obligation" owed to Mexico is not merely an abstract principle; it is an operative rule that intended to shift risks and burdens within the Law of the River. Despite the complexities of that legal regime, the meaning of "national obligation" should be clear to any fair-minded person. The state of Oklahoma and the Cherokee Nation should not have to fund and staff the Coast Guard themselves, because that should be a national obligation. If the U.S. federal government commits to send disaster relief support to a country suffering from an earthquake, the federal government should not require that all support come from Great Lakes region. When the federal government commits the nation to something, the nation should meet that commitment collectively through the federal government. There is no reason why the subcontractors of the CAP should bear all or most of the burden of meeting a national obligation to Mexico, otherwise, it cannot be a national obligation. The same statute that recognized the national nature of that burden also set out the means of carrying that burden—through augmentation funded by the federal government. The current crisis within the Colorado River Basin should catalyze the fulfillment of that national promise.