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The *Water Law Review* welcomes the submission of articles of timely interest to the water law community. Articles should discuss topical issues in water law and related areas, such as environmental and natural resource law, and land use. They should provide an original, analytical, and in-depth treatment of the issue rather than a summary of previous research efforts. Anonymous peer review of articles is available upon request. In addition to articles, the *Water Law Review* also invites submissions of shorter works, such as book reviews, commentaries, and bibliographies.

STYLE

Articles should be well organized, concisely written, and presented in an articulate and scholarly manner. Accordingly, authors should minimize their use of direct quotes.

FORMAT

Manuscripts considered for publications must be typed, double-spaced, and formatted to fit on 8½ x 11 paper. The text should be broken into appropriate headings and subheadings and should conform to the *Chicago Manual of Style* (16th ed. 2010). Citations to references and authorities should be contained in footnotes. Footnotes may also include elaboration on points raised in the text or references to research sources pertaining to points peripheral to those discussed in the text. Footnotes must conform with *The Bluebook: A Uniform System of Citation* (19th ed. 2010), published by the Harvard Law Review Association. Footnotes should be current as of the date of submission. Send hardcopy submissions to: University of Denver Water Law Review, 2255 East Evans Avenue, #447, Denver, Colorado, 80208. Email electronic submissions, as an attached file in Microsoft Word format, to wlr@law.du.edu.

The *Water Law Review* will accept submissions at any time. For consideration for publication in the spring journal, submissions should be received by November 1 of the prior year. For consideration for publication in the fall journal, submissions should be received by August 1.

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VOLUME 17 ISSUE 2 SPRING 2014

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EDITOR'S NOTE

Thank you for your interest in the Spring 2014 Issue of the *Water Law Review*! This Issue marks the end of another successful year (our seventeenth) as a publication and student organization. Our continued success is largely attributable to the support of a community here in Colorado that shares our passion for water law and policy as a vital tool for building a prosperous future in the arid West.

Over the past year, Coloradoans have been especially focused on our water future. In May of 2013, Governor John Hickenlooper issued an executive order mandating that the Colorado Water Conservation Board under its new executive director, James Ecklund, develop a statewide water plan. As one of the last western states to develop such a plan, the topic quickly became a focal point of discussion for stakeholders around the state.

Building on a tradition of fostering dialogue around issues of central importance to the water world, the *Water Law Review* was proud to focus our 7th Annual Spring Symposium on Colorado's ambitious water planning efforts. Entitled *Prepare. Protect. Prioritize. Exploring Colorado's New Water Plan,* the symposium was held on April 18th and drew more than one hundred practitioners, policy makers, students, and other experts to the Sturm College of Law for a day of lively discussion. Thanks to the hard work of Symposium Editor Chris Stevens and the generosity of the Colorado Water Conservation Board and our other sponsors, the event was a rousing success. James Ecklund started the day with an overview of the process and policy behind the new water plan, and panelists from around Colorado and neighboring states shared their perspectives on the promise and perils of statewide water planning. Detailed accounts of the presentations can be found in the Conference Notes section of this Issue, and videos and materials from the symposium can be found at www.duwaterlawreview.com.

It is also my pleasure to present five outstanding articles and a wealth of student writing in this Issue focusing on timely and critical issues in water law and policy. Our first article, *The Problem of Nutrient Pollution: Lessons from Florida's Fragmented Approach,* comes from Ryan Abrams and provides an excellent examination of the challenges of regulating non-point source pollution through the lens of two conflicting frameworks in Florida. Next, Virginia Cornett outlines potential avenues for Mexico to realize its goal of integrated water resource management - specifically environmental flows - in her excellent article entitled *Limitations and Opportunities for Environmental Flow Implementation under Current Mexican Law and Policy.* Ryan Donovan, P. Andrew Jones, and Alyson Scott provide our next article, *One Step Forward and Two Steps Back: The Prospect for Ditch-wide Quantifications and Alternative Transfer Methods.* This excellent piece exlores the potential efficiency of ditch-wide quantification of historic consumptive use, noting recent Colorado Supreme Court decisions that have both endorsed such an approach and created precedent likely to discourage future transfers based on ditch-wide quantification.

Our fourth article, *The Role of Temporary Changes of Water Rights in Colorado,* is authored by Ryan McLane and John Dingess and offers a fascinating examination of the present challenges and future potential of temporary water rights transfers in Colorado. Finally, Professors Stephen Mumme, Kim Collins, and Jose Luis Castro present a persuasive argument for a new binational agreement to sustainably manage the Tijuana River watershed in *Strengthening Binational Management of the Tijuana River.* Please make sure to also enjoy the selection of high-quality student writing located in the Book Notes, Case Note, Conference Reports, and Court Reports sections of the Issue. Meghan Leemon deserves special recognition for her case note examining lessons Colorado might learn from water planning processes throughout the west.

It has been a unique privilege to serve at the helm of the *Water Law Review* this year. I owe a special debt of gratitude to the outstanding staff, Editorial Board, and Advisory Board whose hard work supports this publication and student organization. Without them, and readers like you, this fine journal would not be possible.

Everette R. Bullard
Editor-in-Chief

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WATER LAW REVIEW

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THE PROBLEM OF NUTRIENT POLLUTION: LESSONS FROM FLORIDA'S FRAGMENTED APPROACH

RYAN A. ABRAMS*

We far too commonly produce our food in an environmentally hazardous fashion. Nutrients are an inevitable by-product of modern agriculture and, in excess amounts, can devastate aquatic ecosystems.The need for state action on the problem of nutrient pollution is immediately necessary, as a federal solution seems increasingly unlikely. Florida is a perfect embodiment of the destructive effects of nutrient pollution, but also serves as a testing ground for two conflicting state programs that address the longstanding issue. One program is largely incentive-based, but requires some affirmative actions from farmlands through limited state oversight. The other consists of a complex regulatory scheme, with

* Ryan A. Abrams graduated in May, 2014 from Nova Southeastern School of Law, where he focused his legal studies primarily on Environmental and Land-Use law. Ryan is a native Floridian, born and raised in South Florida, and is passionate about environmental conservation. At Nova, he sat on the executive board of the Environmental and Land-Use Law Society, an on-campus student organization that promotes environmental awareness.

A special thanks to Professor Joel Mintz of Nova Law and to my loving wife, Triliya B. Abrams. Their valuable input and encouragement along the way were especially integral to the production of this article. Special thanks also to Billie Brock, Former President of the Environmental and Land-Use Law Society at Nova Law, for her early editing of and valuable input into this article. Nobody accomplishes anything significant alone.

broad state oversight, that mandates extensive affirmative actions from farmlands. This article examines each program and compares its respective impact on reducing nutrient pollution. The article concludes with important lessons that other states should consider when seeking to implement similar programs.

I. INTRODUCTION

A. SOURCES AND IMPACTS OF NUTRIENT POLLUTION

Nutrient pollution from agricultural runoff is referred to as a nonpoint source of pollution.[1] According to one estimate, nonpoint pollution accounts for fifty percent of nationwide water pollution, and is one of America's last major sources of water pollution.[2] Most nonpoint pollution comes from agricultural activities and resultant agricultural runoff.[3] Agricultural runoff consists of many pollutants, including sediments, pathogens, and pesticides.[4] The most pervasive of the pollutants from agricultural runoff are nutrients, specifically, nitrogen and phosphorus.[5]

Nitrogen and phosphorus cause plants to grow, including algae.[6] When too much nitrogen and phosphorus enter the water, it causes algae to grow faster than ecosystems can withstand.[7] Nutrient pollution can cause this rapid growth of algae, called an "algae bloom."[8] Algae blooms harm water quality, food resources, and habitats, leading to the deaths of large numbers of fish and other marine life.[9] Specifically, the blooms deplete oxygen upon which fish and other aquatic life depend to survive, creating "dead zones".[10] The effects of algae blooms are not confined to animals low on the food chain; rather, algae blooms also hurt animals higher up in the food chain, such as birds, dolphins, and manatees.[11] Harmful algae blooms can also produce toxins that cause skin irritations and hay fever-like symptoms in humans.[12]

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1. *Polluted Runoff: What is Nonpoint Source Pollution?*, U.S. ENVTL. PROT. AGENCY, http://water.epa.gov/polwaste/nps/whatis.cfm (last updated Aug. 27, 2012).

2. *See* Zdravka Tzankova, *The Difficult Problem of Nonpoint Nutrient Pollution: Could the Endangered Species Act Offer Some Relief?*, 37 WM. & MARY ENVTL. L. & POL'Y REV. 709, 746 n.203 (2013); *see also Watershed Assessment, Tracking & Environmental Results*, U.S. ENVTL. PROT. AGENCY, http://ofmpub.epa.gov/waters10/attains_nation_c y.control#STREAM /CREEK/RIVER (last updated Mar. 10, 2014).

3. Jan G. Laitos & Heidi Ruckriegle, *The Clean Water Act and the Challenge of Agricultural Pollution*, 37 VT. L. REV. 1033, 1033-34 (2013).

4. Corey Longhurst, Note, *Where is the Point? Water Quality Trading's Inability to Deal with Nonpoint Source Agricultural Pollution*, 17 DRAKE J. AGRIC. L. 175, 180 (2012).

5. *Id.*

6. *Nutrient Pollution: The Problem*, U.S. ENVTL. PROT. AGENCY, http://www2.epa.gov/nutrientpollution/problem (last updated July 2, 2013).

7. *Id.*

8. *Id.*

9. *Id.*

10. *Nutrient Pollution: The Effects: Environment*, ENVTL. PROT. AGENCY, http://www2.epa.gov/nutrientpollution/effects-environment (last updated Aug. 29, 2013).

11. *Algae Bloom Kills Sea Birds, Other Sea Life In Southern California In Record Numbers*, SCIENCEDAILY (Apr. 28, 2007), http://www.sciencedaily.com/releases/2007/0 4/070427 084149.htm.

12. *The Lake Okeechobee Pollution Crisis and the St. Lucie River and Estuary*,

B. A NATIONAL ISSUE

This article takes the position that only national reform can adequately address nutrient pollution, because the problem often transcends state lines. The Gulf of Mexico dead zone highlights the immediate need for a national solution. This is the largest documented nutrient pollution-caused dead zone, measuring at 5,840 square miles in 2013.[13] The dead zone occurs every summer when nutrient pollution, mainly from agricultural runoff,[14] flows into the Gulf of Mexico from the Mississippi River, which collects drainage from thirty-one upstream states.[15] Despite the clear need for a national solution, state governments are left to confront nutrient pollution themselves because the federal Clean Water Act largely exempts it from restriction.[16]

C. FLORIDA'S NUTRIENT POLLUTION PROBLEM

Before examining Florida's approach to nutrient pollution, it is helpful to first understand the state's interconnected aquatic ecosystem and the destructive effect that nutrient pollution has had on that ecosystem. The Lake Okeechobee Drainage Basin ("LODB") is just south of the City of Orlando.[17] Water in this basin flows south through a series of rivers and man-made canals and drains into Lake Okeechobee, the largest freshwater lake in the southeastern United States.[18] Historically, water from Lake Okeechobee moved south through the Everglades, a vast wetland that stretched up to sixty miles in width and spanned nearly eleven thousand square miles.[19] Water in the Everglades flows south like a moving river until it meets the ocean at the southern tip of the state, where fresh water mixes with salt water in the Florida Bay.[20]

The Everglades ecosystem is naturally low in nutrients, especially phosphorus.[21] Historically, most of the Everglades' water supply came from rainfall.[22]

EARTHJUSTICE (Nov. 9, 2006), http://earthjustice.org/sites/default/files/library/reports/lake-okeechobee-pollution-crisis-and-the-st-lucie-river-and-estuary.pdf. Algae blooms can also cause humans to become ill if they ingest tainted fish or drink contaminated water. *Nutrient Pollution: The Problem, supra* note 6.

13. *Nutrient Pollution: The Effects, supra* note 10.

14. *Id.*; *Nutrient Pollution: Sources and Solutions*, ENVTL. PROT. AGENCY, http://www2.epa.gov/nutrientpollution/sources-and-solutions (last updated Aug. 29, 2013).

15. *Nutrient Pollution: The Effects, supra* note 10.

16. *See* 33 U.S.C. § 1362(14) (1977) (exempting agricultural irrigation return flows from the "point source" definition).

17. Erica Skolte, *Lake Okeechobee: Following the Flow*, U.S. ARMY CORPS OF ENGINEERS: JACKSONVILLE DISTRICT, (Sep. 6, 2013), http://www.saj.usace.army.mil/Media/NewsStories/tabid/6070/Article/18052/lake-okeechobee-following-the-flow.aspx.

18. *Id.*; *Restoring Lake Okeechobee*, S. FLORIDA WATER MGMT. DISTRICT, http://my.sfwmd.gov/portal/page/portal/xweb%20protecting%20and%20restoring/lake%20okeechobee (last visited Mar. 15, 2014).

19. *Brief History of the Everglades*, FLORIDA DEPARTMENT OF ENVTL, PROTECTION, http://www.dep.state.fl.us/evergladesforever/about/ (last updated Feb. 11, 2009).

20. *Following the Flow: An Everglades Journey*, EVERGLADES: WATER'S JOURNEY, http://theevergladesstory.org/journey/ (click on "Historic Water Flow" in the "Conceptual Water Flow" animation) (last visited Mar. 15, 2014).

21. William Orem, *Pick Your Poison: If One Pollutant Doesn't Bring Down the Everglades, Another Might*, EARTH MAGAZINE (Feb. 20, 2009, 3:16 PM), http://www.earthmagazine.org/article/pollutants-threaten-everglades-future.

22. *Id.*

Consequently, the plants and animals that inhabit the region adapted to survive in a low-nutrient, fresh water ecosystem.[23]

Beginning in the late 1800s, human development dramatically changed the landscape of the Everglades, transforming the wetland into a fraction of what it once was.[24] In the early 1900s, the Florida legislature authorized the drainage of about seven hundred thousand acres (twenty-seven percent) of the Everglades just south of Lake Okeechobee, transforming the region into agricultural land now known as the Everglades Agricultural Area ("EAA").[25] This severely disrupted the Everglades' natural southerly flow.[26] As a result of the creation of the EAA, combined with encroaching urban development, just fifty percent of the historic Everglades remain today.[27]

To facilitate drainage of land in the EAA, the state government constructed a series of interconnected canals throughout the region.[28] Eventually, agricultural runoff carrying high concentrations of phosphorus, nitrogen, and other pollutants seeped into the canals and entered the Everglades.[29] By the early 1990s, the level of phosphorus pollution in the Everglades had risen to a peak of 150 parts per billion ("ppb"), which is extraordinarily high for a system that had naturally adapted to only 10 ppb.[30] Additionally, scientific evidence shows that agricultural runoff in the EAA has contributed to significant levels of sulfates in the canals that drain into the Everglades.[31] Sulfates combine with naturally occurring mercury in the Everglades, causing it to become toxic to humans, animals, and plant life.[32]

To the north of Lake Okeechobee, projects to control flooding in the LODB destroyed marshland that had a natural capacity to filter nutrients.[33] In addition, runoff from agricultural uses, the predominant land use in the LODB, sent large amounts of phosphorus, nitrogen, and other pollutants into Lake Okeechobee.[34] The pollution in Lake Okeechobee caused massive algae blooms and oxygen-starved dead zones, which at one time covered up to forty percent of the lake's surface.[35] As a result of decades of unregulated nutrient

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23. *Id.*

24. *Id.*

25. Skolte, *supra* note 17; Forest T. Izuno, *A Brief History of Water Mgmt. in the Everglades Agricultural Area, University of Florida* (June 1989), http://edis.ifas.ufl.edu/pdffiles/AE/AE37500.pdf.

26. *See Following the Flow: An Everglades Journey*, *supra* note 20.

27. FLA. ADMIN. CODE ANN. r. 40E-63.011(1) (1992).

28. Skolte, *supra* note 17.

29. *See* 40E-63.011(2)-(3).

30. Orem, *supra* note 21.

31. William Orem et al., *Sulfur in the South Florida Ecosystem: Distribution, Sources, Biogeochemistry, Impacts, and Management for Restoration*, 35 CRITICAL REVIEWS IN ENVTL. SCI. AND TECH. 249, 262-63 (2011), *available at* http://water.usgs.gov/nrp/proj.bib/Publications/2011/orem_gilmour_etal_2011.pdf.

32. *See* Orem, *supra* note 21.

33. *See* Fla. Dep't of Envtl. Prot., *Kissimmee River Watershed*, FLORIDA'S WATER: OURS TO PROTECT, http://www.protectingourwater.org/watersheds/map/kissimmee_river/ (last visited Mar. 2, 2014).

34. *Id.*; Skolte, *supra* note 17.

35. Jeffrey Schmalz, *Pollution Poses Growing Threat to Everglades*, N.Y. TIMES, Sept. 17, 1989, *available at* http://www.nytimes.com/1989/09/17/us/pollution-poses-growing-threat-to-everglades.html?pagewanted=all&src=pm; Amy Bennett Williams, *Caloosahatchee River's Ills Start*

pollution, the lake now has phosphorus levels in excess of 240 ppb.[36] This causes the water in Lake Okeechobee to be sixty-five times more toxic than safe drinking water guidelines established by the World Health Organization.[37]

Making matters worse, in order to control devastating flooding from Lake Okeechobee, the state government constructed large canals in the late 1800s that connected the Lake to the ocean for the first time.[38] The canals lead to delicate estuaries on each side of the state.[39] When water levels in the Lake get too high, water from the Lake is discharged into these canals.[40] The nutrient-rich water empties into the estuaries, where it has wreaked havoc. In the St. Lucie River Estuary, on Florida's east coast, the discharges have devastated the ecosystem by causing large fish kills and the deaths of hundreds of manatees and dolphins.[41] The water in the estuary, once clear with a sandy bottom, is now chocolate brown with thick algae sludge covering the surface.[42]

Runoff from farmlands in the LODB and EAA is the primary cause of nutrient pollution in Lake Okeechobee and the Everglades.[43] Over ninety percent of the phosphorus entering Lake Okeechobee and the Everglades is from agricultural lands.[44] Moreover, fertilizer use on farmlands is the main source of phosphorus pollution in the LODB and EAA.[45]

Prior to 1987, the state government did nothing to restrict nutrient pollution entering the Everglades ecosystem.[46] Rather, the state was part of the problem. Water District Managers at the time pumped nutrient-rich water from EAA canals into the Everglades.[47] As a result, during the late 1980s, the state declared thousands of acres of wetland in the Everglades unable to sustain wildlife, including some of the rarest birds and other animals.[48] Fish in most parts of the

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with Lake Okeechobee, NEWS-PRESS.COM, Feb. 12, 2011, http://www.news-press.com/article/20110213/GREEN/102130392/.

36. *Lake Okeechobee Backpumping Fact Sheet*, EARTHJUSTICE, http://earthjustice.org/sites/default/files/library/factsheets/lake-okeechobee-backpumping-fact-sheet.pdf (last visited Mar. 24, 2013).

37. *Id.*

38. Fla. Dep't of Envtl. Prot., *supra* note 33.

39. *See* Lizette Alvarez, *In South Florida, a Polluted Bubble Ready to Burst*, N.Y. TIMES, Sept. 8, 2013, *available at* http://www.nytimes.com/2013/09/09/us/lake-okeechobee-in-florida-a-polluted-bubble-ready-to-burst.html; Skolte, *supra* note 17.

40. *See* Alvarez, *supra* note 39.

41. *Id.; see also* Greg Allen, *With Murky Water And Manatee Deaths, Lagoon Languishes*, Sept. 26, 2013, *available at* http://www.npr.org/2013/09/26/223037646/with-murky-water-and-manatee-deaths-lagoon-languishes.

42. Randy Gyllenhaal, *Lake Okeechobee Still Discharging Water; St. Lucie River Still Toxic*, WPBF NEWS (Aug. 7, 2013, 6:19 PM), http://www.wpbf.com/news/south-florida/treasure-coast-news/lake-okeechobee-still-discharging-water-st-lucie-river-still-toxic/-/8882916/21375198/-/r6o7ecz/-/index.html.

43. B.F. MCPHERSON ET AL., U.S. GEOLOGIC SURVEY, WATER QUALITY IN SOUTHERN FLORIDA, 1996-98, at 7 (2000), *available at* http://pubs.usgs.gov/circ/circ1207/pdf/circ1207.pdf.

44. *Lake Okeechobee Watershed Statistics*, EVERGLADES HUB, http://www.evergladeshub.com/okeechobee/watershed.htm (last visited Nov. 13, 2013); *see id.*

45. *See* MCPHERSON ET AL., *supra* note 43, at 8.

46. *See* Gail Clement, *Everglades Timeline*, EVERGLADES DIGITAL LIBRARY, http://everglades.fiu.edu/reclaim/timeline/timeline10.htm (last visited Mar. 25, 2014).

47. Schmalz, *supra* note 35.

48. *See id.*

Everglades were declared unsafe for eating due to mercury contamination.[49] The nutrient-rich water caused an explosion in non-native plant growth and algae that eliminated oxygen in the water, killing wildlife.[50] The plants, mainly cattails, were spreading at an incredible rate of four acres per day.[51] The poor water quality in the Everglades triggered a public outcry and a federal lawsuit, which set Florida on a path to finally addressing the problem of nutrient pollution.[52]

The environmental damage caused primarily by nutrient pollution in Lake Okeechobee, the Everglades, and the coastal estuaries forced the state's hand. Florida's efforts to control runoff from agricultural activities now place the state at the forefront of dealing with one of America's last major sources of water pollution. This article studies Florida's efforts to control agricultural runoff in its central-southern region, which includes the LODB and EAA. The article also points out the many shortcomings of Florida's regulatory framework, particularly in the LODB. The primary focus of this article is on the source controls Florida employs to reduce nutrient pollution from agricultural activities. Accordingly, important end controls such as Stormwater Treatment Areas ("STAs") are not discussed at length.

II. FLORIDA'S STATEWIDE SOURCE CONTROLS

Florida has a region-specific approach to regulating agricultural runoff and, as a result, entirely different policies apply to different regions. One explanation in support of this fragmented regulatory structure is that the "social, economic and environmental costs" of enforcing water quality standards statewide may outweigh the benefits.[53] Accordingly, the state policies that most pointedly address agricultural runoff independently focus on regions where runoff has been most problematic. This has resulted in significant inconsistencies between regional laws that do not necessarily make sense from a statewide policy perspective. Despite Florida's region-specific strategy, there are some state-wide policies that play a role in reducing agricultural runoff.

Florida has developed water quality standards for certain types of water bodies throughout the state. These standards are considered goals, however, and lack enforcement mechanisms.[54] In Lake Okeechobee and the Everglades, a water quality standard exists for phosphorus.[55] Curiously, as of the writing of this article, the state has not adopted water quality standards for nitrogen or sulfates for Lake Okeechobee or the Everglades.[56]

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49. *Id.*; Frank Stephenson, *Florida's Mercury Menace*, FLA ST. U. RES. IN REV. (1997), *available at* http://rinr.fsu.edu/fallwinter97/features/mercury.html.

50. Schmalz, *supra* note 35.

51. *Id.*

52. *See* Katherine Mohr, *How Sweet It Isn't: Big Sugar's Power Politics and the Fate of the Florida Everglades*, 7 FLA. A & M U. L. REV. 329, 340-41 (2012); Clement, *supra* note 46.

53. FLA. ADMIN. CODE ANN. r. 62-302-300(10)(c) (2004).

54. *Id.* 62-302-300(9).

55. *Id.* 62-304-700 (2001); *id.* 62-302-540 (2005). The state is also currently working on developing a water quality standard for mercury. FLA. DEPT. ENVTL. PROT., *Florida's Statewide Mercury TMDL Fact Sheet* (Sept. 2012), *available at* http://www.dep.state.fl.us/water/tmdl/docs/mercury-tmdl-factsheet.pdf [hereinafter *TMDL Fact Sheet*].

56. FLA. ADMIN. CODE ANN. r. 62-302-530 (1990); *id.* 62-304-735 (2013).

In Lake Okeechobee, the water quality standard is expressed as a Total Maximum Daily Load (TMDL), which states that annual phosphorus discharges into the Lake should ideally be no more than 140 metric tons.[57] A TMDL is a "scientific determination of the maximum amount of a given pollutant that a surface water can absorb" without endangering human health and aquatic life.[58] In comparison, according to the Everglades' water quality standard, the Everglades' water should ideally contain no more than 10 parts per billion (ppb) phosphorus.[59] It is not clear why Florida uses different units of measurement to express phosphorus water quality standards in Lake Okeechobee and in the Everglades.

The state also has a Best Management Practices (BMP) program. The Florida Department of Agriculture and Consumer Services (FDACS) oversees and implements the program.[60] BMPs are practices adopted by FDACS that are designed to reduce the amount of fertilizers, animal waste, and other pollutants entering water bodies.[61] Such practices are intended to improve water quality while simultaneously maintaining economic productivity.[62] Farmers can choose to participate in the program by implementing BMPs on their lands.[63]

The BMP program is completely voluntary for agricultural landowners, but participation is encouraged through a number of incentives. One incentive is that the Department of Environmental Protection ("DEP") provides technical and financial assistance to those implementing BMPs.[64] Perhaps the most attractive incentive is that implementation of state-approved BMPs results in a presumption of compliance with state water quality standards.[65] As a result, the state is "not authorized to institute proceedings against the owner of the source of pollution to recover costs or damages associated with the contamination of surface water . . . caused by the pollutants."[66]

Agricultural landowners that apply over one ton of animal manure per acre each year, must do so more than thirty feet from any "wetland, lake, stream, or estuary."[67] Animal manure is a major source of nutrient pollution and is the second leading source of phosphorus pollution in the LODB and EAA.[68] Note that this rule leaves out canals entirely, exempting many agricultural lands adjacent to canals that connect to the Everglades and Lake Okeechobee.

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57. *Id.* 62-304-700 (2001).
58. FLA. DEPT. ENVTL. PROT., *supra* note 55.
59. FLA. ADMIN. CODE ANN. r. 62-302-540(4)(a) (2004).
60. Fla. Dep't of Agric. & Consumer Servs., *BMPs at a Glance*, http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs/BMPs-At-a-Glance (last updated Aug. 13, 2013).
61. *Id.*
62. *Id.*
63. FLA. STAT. § 403.067(7)(c)(2) (2013).
64. *Id.* § 373.4595(3)(c)(2)(b).
65. *Id.* § 403.067(7)(c)(3).
66. *Id.*
67. FLA. ADMIN. CODE ANN. r. 5M-3.004(3)(b)(2011).
68. *See* MCPHERSON ET AL., *supra* note 43, at 3-4.

Florida also regulates the amount of nutrients in commercial plant fertilizers sold in-state;[69] however, agricultural landowners are not prohibited from using fertilizers not in compliance with those regulations.[70] Consequently, landowners are free to purchase out-of-state fertilizers that fail to meet in-state standards.

III. SOURCE CONTROLS IN THE EVERGLADES AGRICUTURAL AREA AND LAKE OKEECHOBEE DRAINAGE BASIN

A. LAKE OKEECHOBEE DRAINAGE BASIN (LODB) SOURCE CONTROL PROGRAM

The State of Florida is divided into five Water Management Districts.[71] The South Florida Water Management District (District) is primarily responsible for administering source controls in the LODB and the EAA.[72]

Florida significantly expanded protection of the LODB in 2007 when it passed the Northern Everglades and Estuaries Protection Program (NEEPP).[73] The NEEPP recognizes the interconnectedness between Lake Okeechobee, the Everglades, and the coastal estuaries.[74] It also recognizes the destructive effect that nutrient pollution from agricultural lands in the LODB has had on these ecosystems due to the southerly flow of water in the region.[75] One of the goals of the NEEPP with respect to Lake Okeechobee is to reduce phosphorus pollution.[76] The law also addresses nutrient pollution in the coastal estuaries; however, the focus of this section is on Lake Okeechobee.

The NEEPP requires owners or operators of nonpoint sources in the LODB to either implement FDACS-approved BMPs or interim measures.[77] In the alternative, they may conduct water quality monitoring prescribed by the District or the DEP.[78] The District has yet to implement this portion of the law, however, and is still in the process of rewriting regulations.[79] In the meantime, the BMP program has remained an entirely voluntary, incentive-based program in the LODB, as it is throughout the state.[80] There are currently no monitoring mechanisms in place ensuring that after implementation, each BMP is successful at reducing phosphorus pollution.[81] As of the writing of this article, seventy-four percent of agricultural lands in the basin participate in the voluntary BMP

69. FLA. STAT. § 576.061(1) (2013).
70. *See id.*
71. *Id.* §§ 373.069(1)(a)-(e).
72. William Baker et. al. eds., *Chapter 4: Nutrient Source Control Programs, in* 2013 SOUTH FLORIDA ENVIRONMENTAL REPORT 4-1-4-2 (2013).
73. Joyce Zhang & Bruce Sharfstein, *Chapter 8: Lake Okeechobee Watershed Protection Program, in* 2013 SOUTH FLORIDA ENVIRONMENTAL REPORT 8-7 (2013).
74. FLA. STAT. § 373.4595(1)(c) (2013).
75. *Id.* § 373.4595(1)(e).
76. *Id.* §§ 373.4595(1)(f),(g).
77. *Id.* § 373.4595(3)(c)(1)(b).
78. *Id.*
79. Baker, *supra* note 72, at 4-8.
80. *See id.*
81. *See* FLA. STAT. § 403.067(7) (2013).

program.[82]

In addition to the BMP program, in the LODB, agricultural landowners that connect to or make use of canals or other "works of the district" are generally required to obtain a permit, called a works of the district (WOD) permit.[83] The Surface Water and Improvement Management Act (SWIM) originally authorized the WOD permit program in 1989.[84] All agricultural landowners within the LODB are presumed to use or connect to the works of the district.[85] Consequently, unless expressly exempt, landowners must obtain a WOD permit in order to conduct agricultural activities on their properties.[86]

The WOD permit primarily limits the amount of phosphorus that permittees can "discharge" from their land.[87] However, the permit only limits the amount of phosphorus that property owners may release from a point on their properties.[88] Unfortunately, this program lacks effectiveness because the primary source of nutrient pollution is runoff rather than any single discernable point of discharge.[89]

The phosphorus limitations are calculated based on a goal of reducing the total phosphorus load in Lake Okeechobee to 397 metric tons annually.[90] The SWIM Act originally imposed this goal in 1989,[91] but the NEEPP seeks to achieve the TMDL goal of 140 metric tons annually for the lake.[92] The state has yet to fully implement NEEPP, however, which is why the 397 metric ton

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82. Lesley Bertolotti, et al., *Chapter 8: Lake Okeechobee Watershed Protection Program and Three-Year Update, in* 2014 SOUTH FLORIDA ENVIRONMENTAL REPORT 8-108 (2014).

83. FLA. ADMIN. CODE ANN. r. 40E-61.041(1) (1989).

84. Bertolotti, *supra* note 82, at 8-114.

85. FLA. ADMIN. CODE ANN. 40E-61.041(1) (1989).

86. *Id.*

87. *Id* r. 40E-61.381(1)-(2)(a)(1) (2006).

88. William Baker et al. eds, *Chapter 4: Nutrient Source Control Programs, in* 2014 SOUTH FLORIDA ENVIRONMENTAL REPORT 4-32 (2014).

89. Laitos & Ruckriegle, *supra* note 3, at 1036-37.

90. FLA. ADMIN. CODE ANN. r. 40E-61.020(1) (2006).

91. *Id.*

92. FL. DEPT. OF ENVIRONMENTAL PROTECTION, TOTAL MAXIMUM DAILY LOAD FOR TOTAL PHOSPHORUS LAKE OKEECHOBEE, FLORIDA 1 (2001) ("This TMDL proposes an annual load of 140 metric tons of phosphorus to Lake Okeechobee. . . . The implementation of the TMDL will follow a phased approach consistent with Section 373.4595, Florida Statutes. . . ."), *available at* http://www.dep.state.fl.us/water/tmdl/docs/tmdls/final/gp1/Lake_O_TMDL_ Final.pdf.

> It is the intent of the Legislature to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Lake Okeechobee watershed. . . and downstream receiving waters, through the phased, comprehensive, and innovative protection program set forth in this section which includes long-term solutions based upon the total maximum daily loads established in accordance with s. 403.067. . . .

FLA. STAT. § 373.4595(1)(l) (2013)

> A protection program for Lake Okeechobee that achieves phosphorus load reductions for Lake Okeechobee shall be immediately implemented as specified in this subsection. The program shall address the reduction of phosphorus loading to the lake from both internal and external sources. Phosphorus load reductions shall be achieved through a phased program of implementation. Initial implementation actions shall be technology-based, based upon a consideration of both the availability of appropriate technology and the cost of such technology, and shall include phosphorus reduction measures at both the source and the regional level.

Id. § 373.4595(3).

goal remains in effect.

State regulations require most WOD permittees to monitor the quality of the water discharged from their properties, depending on where in the LODB they are located.[93] The permittees must submit the results of this monitoring to the District on a bi-weekly basis.[94] The District may reduce the frequency of monitoring required if, after a reasonable period, the discharger consistently achieves compliance with the phosphorus limitation.[95]

The District may enforce compliance with the WOD permit, which is evaluated through on-site inspections and record review, by way of legal proceedings.[96] If a violation of the permit occurs, the District has the authority to issue administrative enforcement orders,[97] initiate court actions seeking injunctive relief and/or civil penalties of up to $10,000,[98] or seek a warrant for arrest of the violator.[99]

B. PROGRESS MADE IN THE LODB

NEEPP requires the District to monitor total phosphorus (TP) levels to determine the amount of progress made.[100] The District must calculate the TP levels based on a five-year rolling average.[101] This means that every year, the District calculates the TP load (measured in metric tons) based on the average annual load during the preceding five-year period.[102] The District uses a five-year average to calculate phosphorus loading because, in any given year, other factors may cause fluctuations, most notably climate conditions such as increased rainfall.[103] Thus, theoretically, the five-year average is less vulnerable to random chance causing skewed results. Once the five-year average is calculated, the District compares that figure with the Lake Okeechobee TMDL in order to track progress.[104]

The results from the District's monitoring reveal that the phosphorous levels have only slightly decreased in the LODB. When tracking began in 1985, the five-year average TP load was 530 metric tons, whereas in 2013, the TP load measured at 451 metric tons.[105] That is only a 15 percent reduction.[106] Additionally, during the twenty-eight year tracking period, the average annual TP load exceeded the current Lake Okeechobee TMDL (140 metric tons) by an average of 349 metric tons.[107]

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93. FLA. ADMIN. CODE ANN. r. 40E-61.381(2)(a) (2013).
94. *Id.* 40E-61-381(2)(a)(1) (2006).
95. *Id.*
96. *See id.* r. 40E-61.301(1); Jodie Hansing & Chambal Pandey, *Executive Summary*, *in* S. FLA WATER MGMT. DIST., 2013 SOUTH FLORIDA ENVIRONMENTAL REPORT 7, 16-17, 21 (2013).
97. FLA. STAT. § 373.119(1) (2013).
98. *Id.* § 373.129(5) (2013).
99. FLA. ADMIN. CODE ANN. r. 40E-63.145(6)(d) (2001).
100. FLA. STAT. § 373.4595(3)(d)(1) (2013).
101. *Id.*; § 403.067(7)(a)(5).
102. *See id.* § 403.067(7)(a)(5) (2013).
103. Bertolotti, *supra* note 82, at 8-27.
104. *See id.*
105. *Id.* at 8-28.
106. *See id.*
107. *See id.* at 8-22.

C. EVERGLADES AGRICULTURAL AREA (EAA) SOURCE CONTROL PROGRAM

The source controls in the EAA, which the Everglades Forever Act (EFA) mandates, are far more rigorous than those in the LODB. As in the LODB, the state exclusively addresses phosphorus pollution in the EAA.[108] An important aspect of the EAA source control program is that landowners are collectively required to reduce TP loading by twenty-five percent compared to a baseline period (1980-88), a time before source controls were in effect.[109] The data reveals that the source controls have been instrumental in not only achieving this twenty-five percent goal, but also exceeding it considerably.[110]

Whereas, in the LODB, BMPs have been voluntary and incentive driven, in the EAA, Florida law requires BMP plans as a condition for issuance of a WOD permit.[111] The EFA requires the permittee to monitor implementation, operation, and continued effectiveness of BMPs.[112] Landowners must also create fertilization and water management plans for each crop, as well as a water management system design plan to use water more efficiently.[113] In addition, the EFA requires agricultural landowners to sponsor BMP research aimed at identifying the most effective practices for reducing phosphorus pollution.[114] The mandatory implementation of BMPs is considered the primary regulator of TP loading in the EAA.[115]

In addition to the BMP plan, landowners must monitor water quality and provide "reasonable assurances" that they are accurately documenting water discharges and TP loads.[116] Landowners must submit all monitoring results to the District.[117] Once the District receives these results, if the District determines that the permittee is out of compliance with the approved BMP plan and/or water quality monitoring plan, the District will require the permittee to achieve compliance.[118]

As in the LODB, the WOD permit also imposes a limit on phosphorus levels in water discharged into a canal. This limitation applies to water released through a "structural device or hydrologic feature,"[119] which includes runoff. In comparison, WOD permits issued in the LODB limit phosphorus only from points of discharge.[120] Again, this is an important difference because the majority of nutrient pollution comes from runoff rather than from discernible points of discharge.[121]

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108. FLA. STAT. § 373.4592(1)(d) (2013).
109. Carlos Adorisio et. al., *Status of Source Control in the ECP Basins*, *in* 2013 SOUTH FLORIDA ENVIRONMENTAL REPORT 4-20, 4-21 (William Baker et al. eds.) (2013).
110. *See* Baker, *supra* note 72, at 4-3.
111. FLA. STAT. § 373.4592(4)(f)(2)(c) (2013).
112. FLA. ADMIN. CODE ANN. r. 40E-63.136(1)(f) (2001).
113. *Id.* r. 40E-63.136(1)(d)-(e) (2001).
114. FLA. STAT. §§ 373.4592(2)(a), (4)(f)(2)(a) (2013).
115. Adorisio et. al., *supra* note 109, at 4-7.
116. FLA. ADMIN. CODE ANN. r. 40E-63.136(2) (2001).
117. *Id.* r. 40E-63.143(2)(c).
118. *Id.* r. 40E-63.145(2).
119. *Id.* r. 40E-63.102 (10); r. 40E-63.130(1).
120. Baker, *supra* note 88, at 4-32.
121. Laitos & Ruckriegle, *supra* note 3, at 1037.

The District possesses the same authority to enforce permits issued in the EAA as it does for permits issued in the LODB.[122] Pursuant to the EFA, the District can issue administrative enforcement orders, pursue court actions for injunctive relief or penalties not in excess of $10,000, and/or seek a warrant for arrest of the violator.[123]

The EFA also employs a unique and innovative tool for reducing phosphorus pollution: taxing farmlands in the EAA just for the privilege of conducting agricultural activities there.[124] This tax is called the Everglades Agricultural Privilege Tax.[125] The District taxed agricultural lands at a rate of up to $35 per acre until November, 2013, after which state law reduced the tax ceiling to $25 per acre.[126] The state uses the proceeds to pay for the Everglades Long-Term Plan,[127] which includes a wide array of water quality improvement measures aimed at ensuring that waters flowing into the Everglades achieve compliance with the 10 ppb phosphorus standard.[128] Components of the Long-Term Plan include expanding BMPs, as well as enhancing Stormwater Treatment Areas (STAs) designed to store water from the EAA in an effort to further reduce phosphorus levels.[129]

The structure of the privilege tax provides incentives for reductions in phosphorus loads flowing into EAA canals.[130] Farmers receive tax credits for annual reductions in phosphorus from their land.[131] To qualify for a credit, a land's total phosphorus reductions must exceed twenty-five percent compared to phosphorus levels in 1993, the baseline year.[132] State law provides that a tax credit worth sixty-five cents per acre is due for each percentile reduction achieved above twenty-five percent.[133]

Tax credit savings must not cause the privilege tax to fall below $24.89 per acre, which is the "minimum tax."[134] A landowner who reduces phosphorus by at least forty-five percent automatically qualifies for minimum tax treatment.[135] Similarly, agricultural lands that grow only vegetables automatically qualify for minimum tax treatment.[136] The tax credit program effectively ended on December 1, 2013, when the tax ceiling was reduced from $35 per acre to $25 per acre.[137] Consequently, at the time of this article, the incentive structure of the

122. *See* FLA. ADMIN. CODE ANN. r. 40E-63.145(6) (2001).
123. *Id.*
124. FLA. STAT. § 373.4592(6)(a) (2013).
125. *Id.*
126. *Id.* §§ 373.4592(6)(c)(1), (6)(a).
127. *Id.* § 373.4592(6)(c)(6).
128. FLA. ADMIN. CODE ANN. r. 62-302.540(4)(a) (2005); S. FLA. WATER MGMT. DIST., EVERGLADES AREA TRIBUTARY BASINS LONG-TERM PLAN FOR ACHIEVING WATER QUALITY GOALS ES-6, 8 (2003), *available at* http://my.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/executivesummary_0.pdf (last visited Mar. 26, 2014).
129. FLA. ADMIN. CODE. ANN. r. 62-302.540(2)(b), (h) (2005).
130. *See* FLA. STAT. § 373.4592(6)(c)(2) (2013).
131. *See Id.* § 373.4592(6)(c).
132. *Id.* § 373.4592(6)(c)(3).
133. *Id.*
134. *Id.* § 373.4592(6)(c)(4).
135. *Id.* § 373.4592(6)(c)(5).
136. *Id.* § 373.4592(6)(d)(1).
137. *Id.* §§ 373.4592(6)(c)(1), (6)(c)(6).

tax credit no longer exists, and all agricultural lands will receive the same tax treatment.[138]

D. PROGRESS MADE IN THE EAA

The 2014 South Florida Environmental Report provides for both annual measurements and a five-year trend analysis of TP loading in the EAA[139] The EAA source control program meets the twenty-five percent phosphorus reduction goal once the average yearly TP load is at least twenty-five percent less than the average annual load during the baseline period.[140] The report adjusts the average baseline TP load to reflect rainfall variability, which affects the amount of phosphorus entering the canals.[141] For 2013, the average TP load was 154 metric tons, whereas the baseline period, adjusted for increased rainfall, was 263 metric tons.[142] That is a forty-one percent reduction, which greatly exceeds the twenty-five percent mark.[143]

To accurately compare progress in the EAA with progress in the LODB, this article considers the same methodology as applied to both regions. In the LODB, a five-year average calculation does not adjust for rainfall variability.[144] Applying the same methodology to the EAA, the five-year baseline average (1981-85) was 242 metric tons.[145] The five-year average from 2009-2013 was 112 metric tons.[146] This is roughly a fifty-four percent reduction, whereas the equivalent methodology in the LODB revealed only a fifteen percent reduction.[147] It is beyond the scope of this article to determine whether the substantial phosphorus reduction in the EAA directly relates to the state's source control programs there. Nonetheless, the significant reduction of phosphorus in the EAA shows that the source control programs might be effective. In contrast, the limited source controls and market-based BMP program in the LODB have failed to produce meaningful results.

Despite considerable progress in reducing phosphorus pollution at the source level, the phosphorus levels in EAA canals are still much too high to allow the water to drain into the Everglades untreated. The current phosphorus levels are at 141 ppb, whereas the water quality standard is only 10 ppb.[148] This is why the state has constructed a number of STAs that store the water from the

138. *Id.* § 373.4592(6)(c)(4).

139. Carlos Adorisio et al., *Status of Source Control in the ECP Basins, in* 2014 SOUTH FLORIDA ENVIRONMENTAL REPORT, 4-11 to 12 (2014).

140. *See Id.* § 373.4592(6)(c)(3).

141. *See* Adorisio et al., *supra* note 139 at 4-11 n.2.

142. *Id.* at 4-11 tbl.4.3.

143. *Id.*

144. FLA. STAT. § 403.067(7)(a)(5) (2013).

145. *See* Adorisio et al., *supra* note 139, at 4-11 to 12.

146. *Id.* at 4-11.

147. Bertolotti, *supra* note 82, 8-35.

148. FLA. ADMIN. CODE ANN. r. 62-302-540(4)(a) (2014); Adorisio et al., *supra* note 139, at 4-11.

canals before releasing it into the Everglades.[149] The STAs incorporate vegetation that naturally expunges phosphorus from the water.[150] As a result of the source control efforts and the STAs, current phosphorus levels in water flowing into the Everglades have dropped from a peak level of 150 ppb to 30 ppb.[151]

IV. SHORTFALLS OF FLORIDA'S APPROACH TO AGRICULTURAL RUNOFF

A. GAPS IN THE LAW

It is odd that Florida focuses so much attention on reducing phosphorus pollution in Lake Okeechobee and the Everglades, yet does not address nitrogen whatsoever. Such lack of attention to nitrogen reduction happens despite the fact that at least two state administrative agencies have released studies concluding that nitrogen pollution in the state, particularly in Lake Okeechobee, is as significant a threat to ecosystem health as phosphorus pollution.[152] Thus, it is no wonder the state has created TMDLs for nitrogen in the St. Lucie and Caloosahatchee Estuaries, [153] where the excess water of Lake Okeechobee is released.[154]

Furthermore, Florida has not addressed sulfate loading in the EAA and Lake Okeechobee, which is a well-documented cause of toxic mercury pollution.[155] Sulfates from agricultural runoff combine with naturally occurring mercury, causing the mercury to become toxic to humans, animals, and plant life.[156] The state is in the administrative process of finalizing a TMDL for mercury.[157] However, the legislature must authorize new source controls to require agricultural landowners to reduce sulfate loading and thus decrease toxic mercury pollution.

Additionally, while the twenty-five percent phosphorus reduction goal in the EAA has been instrumental to the success of the source control program,[158] the goal is simply unambitious. Why not achieve a higher goal, perhaps seventy-five percent? The water in the Everglades still has three times the phosphorus

149. *Treatment, Best Practices and Increased Water Storage*, S. FLA. WATER MGMT. DISTRICT, http://www.sfwmd.gov/portal/page/portal/xweb%20protecting%20and%20restoring/water%20quality%20stormwater%20treatment%20areas (last visited Mar. 9, 2014).

150. *Id.*

151. Orem, *supra* note 21.

152. *See* Water Quality Standards for the State of Florida's Lakes and Flowing Waters, 75 Fed. Reg. 75762, 75768-69 (Dec. 6, 2010); ANTHONY C. FEDERICO ET AL., TECHNICAL PUBLICATION #81-2, 24 (1981), *available at* http://www.sfwmd.gov/portal/page/portal/pg_grp_tech_pubs/portlet_tech_pubs/dre-128.pdf.

153. Baker, *supra* note 72, at 4-32.

154. FLA. STAT. 373.4595(3)(b)(2)(g).

155. *See* Curtis D. Pollman & Donald M. Axelrad, *Modeling Sulfate and Gambusia Mercury Relationships in the Everglades*, *in* 2013 SOUTH FLORIDA ENVIRONMENTAL REPORT, 3B-30 to 31.

156. *See* Orem, *supra* note 21.

157. Pollman & Axelrad, *supra* note 156, at 3B-2.

158. *See* News Release, S. Fla. Water Mgmt. Dist., Phosphorous Reductions Continue to Improve Everglades Water Quality (July 15, 2013), *available at* http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/nr_2013_0715_phosphorus_reduction.pdf.

content compared to the Everglades water quality standard.[159] Even worse, the water in canals throughout the EAA contains fourteen times more phosphorus than that standard.[160] While the EAA programs have achieved commendable success for the region, the state must do more to control phosphorus at the source level in order to realistically meet the Everglades' stringent 10 ppb phosphorus standard.

B. ARBITRARY DIFFERENCES BETWEEN REGIONAL LAWS

The stark differences between the source control programs administered in the EAA and LODB beg the question: why treat interconnected ecosystems so dissimilarly? There seems to be no logical answer. Yet, one may speculate that the state legislature passed separate laws for each region at different times, each law reflecting different legislative priorities. Consequently, the treatment of agricultural lands within an interconnected ecosystem is enormously inconsistent. The state imposes taxes in the EAA for the privilege of conducting agricultural activities there, whereas no such taxes exist for the LODB. BMPs are mandatory in the EAA, but are voluntary in the LODB. There is a mandatory goal for phosphorus reduction in the EAA, albeit an unambitious one, while no such goal exists for the LODB. In the future, states crafting laws to address the problem of agricultural runoff would be wise to create a more uniform and sensible system.

The NEEPP is a step in the right direction towards reducing the arbitrary differences between source controls in the EAA and LODB. It incorporates into the WOD program a more stringent goal of reducing phosphorus loading in the LODB (140 metric tons rather than the current 360 tons).[161] This is a much-needed change. On the other hand, the NEEPP stops short of expressly mandating all farms in the LODB to implement BMPs by providing other alternatives, though the EAA mandates BMPs.[162] Furthermore, the LODB imposes no privilege tax, unlike the EAA. Time will tell whether the NEEPP, when fully implemented, will achieve results for the LODB similar to those the EAA has achieved through its source controls.

V. CONCLUSION

Despite the senseless contrast between the approaches to agricultural runoff Florida has employed in the EAA and LODB, a unique opportunity exists to test the effectiveness of two very different ways of tackling nutrient pollution. On one hand, in the LODB, the state has employed an incentive-based approach with limited regulatory oversight. On the other hand, the approach used in the EAA involves primarily regulatory oversight, in addition to some market-based incentives in the form of tax credits.

As this article demonstrates, the lesson to learn is that meaningful results require laws with so-called 'teeth.' Voluntary, incentivized BMPs in the LODB

159. Orem, *supra* note 21.

160. *See* FLA. ADMIN. CODE ANN. r. 62-302-540(4)(a) (2014); Adorisio et al., *supra* note 139, at 4-11.

161. *See* FLA. STAT. § 373.4595(3) (2013); Baker et al., *supra* note 72, at 4-8.

162. FLA. STAT. § 373.4595(3)(c)(1)(b) (2013).

make environmental responsibility simply a business decision, as opposed to a requirement as it is in the EAA. Additionally, mandating a phosphorus reduction goal has proved quite effective in the EAA, which has exceeded its goal by nearly twofold. No such goal exists for the LODB. Furthermore, agricultural privilege taxation in the EAA is an innovative tool that may have been instrumental in further reducing phosphorus levels there. Overall, it is not difficult to see why the EAA has been considerably more successful than the LODB in reducing phosphorus levels in agricultural runoff.

The EAA source control program serves as a model for other states to consider when developing their own programs. State and local governments in Florida and elsewhere should expand on the EAA model by imposing greater restrictions where necessary. An ideal program should incorporate enforceable water quality standards for nutrients in addition to phosphorus, such as nitrogen and sulfates. Furthermore, with regard to mandatory reduction goals, states should set the bar high rather than settle for an arbitrarily low goal such as the one adopted for the EAA. At a time when federal oversight of agricultural runoff is largely absent, states themselves must confront America's last major source of water pollution. The time for action is now, or else we face the inevitable disappearance of once thriving ecosystems that many of us take for granted.

LIMITATIONS AND OPPORTUNITIES FOR ENVIRONMENTAL FLOW IMPLEMENTATION UNDER CURRENT MEXICAN LAW AND POLICY

VIRGINIA E. CORNETT*

I. INTRODUCTION

A. ABSTRACT

A new administration has recently assumed office in Mexico, which provides an excellent opportunity to review and improve Mexican legislation governing water management, including the implementation of environmental

* When writing this article, the author was an associate in the Mexico City law firm of Von Wobeser y Sierra, S.C. The article is based on a study undertaken by the author at the request of Robert Wigington of The Nature Conservancy, and under the guidance of Rebecca Tharme, also of The Nature Conservancy, to both of whom the author is very grateful. Any errors in the article, however, are solely the author's. The author would like to thank Von Wobeser y Sierra, S.C. for allowing her to undertake the study as a pro bono project of the firm.

flows. The Mexican National Water Law, (*Ley de Aguas Nacionales* or "LAN"), states that integrated water resources management ("IWRM") is the basis of national water policy.[1] The purpose of IWRM as defined in the LAN is to maximize social and economic welfare equitably without compromising the sustainability of vital ecosystems.[2] Thus, implementation of environmental flow regimes in river basins should be considered an essential element of IWRM's focus on preserving the environmental integrity of water systems.

This article will look at how current law and policy in Mexico is facilitating or limiting the implementation of environmental flows in Mexico and then make recommendations for improvements in the legislation. The first section briefly describes Mexico's water resources and the institutions managing them. The second section takes a close look at the current policy and law facilitating or limiting the implementation of environmental flows. The third section discusses other existing legal tools that government agencies and citizen organizations can use in the absence of legislative reform. The final section offers recommendations for reforms that would improve the likelihood of successful implementation of environmental flows in Mexico.

B. ENVIRONMENTAL FLOWS BACKGROUND

The 10th International River Symposium and International Environmental Flows Conference took place in 2007 in Brisbane; representatives from over fifty nations attended. The Brisbane Declaration proclaimed that environmental flows are "essential for freshwater ecosystem health and human well-being,"[3] reflecting a growing global consensus that governments must incorporate environmental flows into land and water management. Environmental flows have been defined as the "quality, quantity and timing of water flows required to maintain the components, functions, processes, and resilience of aquatic ecosystems which provide goods and services to people."[4] Water-derived ecosystem services, which provide the impetus for implementing environmental flows, include provision of fresh water, food, water purification, flood regulation, soil formation, disease regulation, nutrient cycling, recreation, ecotourism, and aesthetic values.[5]

In order to restore and maintain environmental flows, the Brisbane conference delegates called on all governments and other stakeholders to commit to actions to estimate environmental flow needs everywhere immediately, integrate

1. Ley de Aguas Nacionales [LAN] [National Water Law], *as amended*, art. 14 Bis 5, frac. II, Diario Oficial de la Federación [DO], 1 de Diciembre de 1992 (Mex.).

2. *Id.* art. 3, frac. XXIX.

3. 10th International Rivers*ymposium* and International Environmental Flows Conference, Sept. 3-8, 2007, *The Brisbane Declaration*, 1, *available at* http://www.conserva tiongateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/ELOHA/Pages/Brisbane-Declaration.aspx.

4. THE NATURE CONSERVANCY, ENVIRONMENTAL FLOWS, WATER FOR PEOPLE - WATER FOR NATURE 1 (2006), *available at* http://www.potomacriver.org/sustainableflows/Env%20Flows_General%20TNC%20Fact%20Sheet.pdf.

5. UN ECOSYSTEM MANAGEMENT PROGRAMME, WATER SECURITY AND ECOSYSTEM SERVICES: THE CRITICAL CONNECTION 10, Mar. 2009, UNITED NATIONS ENVIRONMENT PROGRAMME DHI, *available at* http://www.unepdhi.org/~/media/Microsite_UNEPDHI/Publications/documents/unep/The_critical_connection.ashx.

environmental flow management into every aspect of land and water management, and establish institutional frameworks, such as laws, regulations, policies, and programs, for integrating environmental flows into land and water management.[6]

Mexico has implemented a number of initiatives that address environmental flow needs in specific river basins. Mexico has also issued a regulatory measure as a guideline for the determination and implementation of environmental flows. As this article will show, however, the full establishment of the institutional framework for environmental flows has yet to occur.

II. WATER SECTOR OVERVIEW

A. THE WATER RESOURCES AND THEIR USAGE

Mexico's water resources are unevenly distributed, with two-thirds of the country considered arid or semi-arid while the southeast region is very wet.[7] Precipitation is highly seasonal throughout most of the country, with 68 percent occurring between the months of June and September.[8] The country has identified a total of 1,471 river basins[9] and 653 aquifers.[10] There are fifty principal rivers containing 87 percent of the surface flow of the country, and two-thirds of the surface flow is located in just seven rivers: Grijalva-Usumacinta, Papaloapan, Coatzacoalcos, Balsas, Pánuco, Santiago, and Tonalá.[11]

As Part III discusses below, Mexico considers water resources to belong to the nation and the federal government issues concessions (grants for use to public or private individuals or entities) and assignments (grants for use to municipalities, states and the Federal District for urban public or domestic use) for the use of national water resources.[12] Groundwater may be "freely extracted", except in zones regulated for extraction, in areas where the government prohibits extraction, or in established reserved zones.[13]

About 37 percent of the total volume allocated for offstream uses is from groundwater aquifers, with the remaining 63 percent from surface sources.[14] Offstream water use is distributed as follows: 77 percent for agricultural use, 14 percent for public urban use, and 9 percent for industrial and thermoelectric use.[15] Groundwater supplies 70 percent of urban use, 33 percent of agricultural use, and 50 percent of industrial use.[16] Although Mexico has not yet developed hydroelectric resources to their full potential, there are nonetheless more than 4,000 dams in Mexico, 667 of them classifying as large dams by international

6. *The Brisbane Declaration*, *supra* note 3, at 2.

7. COMISIÓN NACIONAL DEL AGUA, STATISTICS ON WATER IN MEXICO 3 (2010) [hereinafter SWM 2010], *available at* http://www.conagua.gob.mx/english07/publications/EAM2010Ingles_Baja.pdf.

8. *Id.* at 23.

9. *Id.* at 18.

10. *Id.* at 20.

11. *Id.* at 34.

12. *See infra* III.C; SWM 2010, *supra* note 7, at 122.

13. LAN, art. 18.

14. SWM 2010, *supra* note 7, at 43, 60.

15. *Id.* at 61.

16. *Id.* at 66-69.

standards.[17]

B. BRIEF HISTORY OF WATER MANAGEMENT

For much of the twentieth century, Mexico's water management was centralized and focused on investment in large infrastructure projects. In the 1980s and 1990s, both internal pressures and international trends led to changes in this paradigm, with a new emphasis on principles of efficiency, decentralization, and sustainability. The 1992 LAN reflected these changes and established river basins as the management unit of water resources.[18] The LAN also formed river basin councils composed of water users from the public and private sectors in order to involve local stakeholders in water planning and decision-making.[19] This decentralization and regionalization of water management was reinforced with the extensive 2004 reforms of the 1992 LAN,[20] which delegated the duties of the National Water Commission ("CONAGUA") at the regional level to thirteen river basin organizations,[21] determined water to be a federal public good whose preservation and sustainability is a matter of national security,[22] and defined the concept of environmental use, among other changes.[23] The reforms adopted IWRM as the basis for national water policy[24] and defined that concept as "the coordinated management and development of water, land, related resources and the environment, in order to equitably maximize social and economic welfare without compromising the sustainability of vital ecosystems."[25]

A recent UN Environment Program report indicates

> [t]he integrated approach embodied within the concept of IWRM marks a fundamental departure from the perspective of water as a commodity, to one that considers all major water uses on an equal basis, including the water needs of nature. It collectively considers both the scientific and technical elements of water management (e.g., water quantity and quality; geology; physiography and topography; flora; fauna; water supply and demands), and the socioeconomic components (often referred to as water governance, and including such elements as institutions, regulations, policy, public awareness, financial concerns, cultural values, political realities, etc.).[26]

While the LAN ostensibly adopts IWRM as the basis of national water policy, Mexico has not fully integrated IWRM concepts, particularly the water needs of nature, into either the law or water management in Mexico.

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17. *Id.* at 78-79.

18. *See* LAN, art. VII Bis, frac. I.

19. *See id.*, frac. II.

20. Christopher A. Scott & Jeff M. Banister, *The Dilemma of Water Management "Regionalization" in Mexico Under Centralized Resource Allocation*, 24 INT'L J. OF WATER RES. DEV. 1, 61, 62 (2008), *available at* http://udallcenter.arizona.edu/publications/sites/default/files/44_en.pdf; Margaret Wilder, *Water Governance in Mexico: Political and Economic Apertures and a Shifting State-Citizen Relationship*, 15 ECOLOGY AND SOC'Y 2, 22 (2010), *available at* http://www.ecologyandsociety.org/vol15/iss2/art22/.

21. LAN, arts. 12 Bis, 2, Bis 1.

22. *Id.* art. 14 Bis 5, frac. I.

23. *Id.* art. 3, frac. LIV.

24. *Id.* art. 14 Bis 5, frac. II.

25. *Id.* art. 3, frac. XXIX.

26. UN ECOSYSTEM MANAGEMENT PROGRAMME, *supra* note 5, at 14.

C. THE CURRENT INSTITUTIONS

As mentioned in the previous section, over the last two decades, Mexico has made an effort to decentralize water management in the country and to institutionalize stakeholder participation in the decision-making process.[27] The current scheme encompasses a number of different governmental and independent bodies in Mexico that participate in water management and have been or may become involved in the implementation of environmental flow regimes. The following is a brief description of the different institutional players in the water sector in Mexico.

1. Federal Institutions

a. Federal Executive Institutions

At the top of the water management hierarchy is the federal executive branch, which is responsible for formulating and publishing water policy, as well as issuing decrees establishing regulated, prohibited, or reserved water zones, and declarations of rescue or recovery of concessions for public service or public interest- all potential water conservation tools.[28]

The next agency in the hierarchy is the Ministry of the Environment and National Resources (*Secretaría del Medio Ambiente y Recursos Naturales* or "SEMARNAT"), which is responsible for proposing water policy, laws, regulations, and standards to the President and is the parent agency of CONAGUA,[29] the most important institution in the water sector in Mexico, discussed in more detail below.

There are three different categories of agencies under SEMARNAT. Deconcentrated agencies have a certain limited autonomy regarding decision-making and budgeting but no independent legal capacity and remain ultimately subordinate to SEMARNAT. These agencies include, along with CONAGUA, the Federal Delegations of SEMARNAT in the states, the Mexican Environmental Protection Enforcement Agency (*Procuraduría Federal de Protección al Ambiente* or "PROFEPA"), the Protected Natural Areas Agency (*Comisión Nacional de Areas Naturales Protegidas* or "CONANP"), and the National Institute of Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climatico* or "INECC").[30]

Under SEMARNAT there are also two decentralized agencies, having independent legal capacity and their own budget, which are the National Forestry Commission (*Comisión Nacional Forestal* or "CONAFOR") and the Mexican Water Technology Institute (*Instituto Mexicano de Tecnología del Agua* or

27. *See* Scott & Banister, *supra* note 20, at 65.

28. *See* LAN, art. 6, fracc. III, IV. See section III.C.1.c. for further discussion of these tools.

29. *Id.* art. 8, fracc. I, II; art. 9.

30. ORG. FOR ECON. CO-OPERATION & DEV., OECD ENVIRONMENTAL PERFORMANCE REVIEWS, MEXICO 2013 43 (Apr. 12, 2013); *see id.* arts. 9, 14 Bis 4. With the recent publication of the Climate Change Law (Ley General de Cambio Climático), the National Ecology Institute (*Instituto Nacional de Ecología* or INE) was reorganized into the National Institute of Ecology and Climate Change.

"IMTA").[31] The National Commission for the Understanding and Use of Biodiversity (*Comision Nacional para el Conocimiento y Uso de la Biodiversidad* or "CONABIO") is an inter-ministerial agency. As will be mentioned in the section on other legal tools below, these environmental agencies have certain legal tools at their disposal that could support the implementation of environmental flows.

As indicated, CONAGUA (also referred to herein as the "Commission") is the primary governmental agency responsible for water management in Mexico.[32] It enforces and administers the LAN and proposes water policy and regulations to SEMARNAT.[33] CONAGUA is also in charge of all aspects of continental water management, from supply to oversight of wastewater discharge.[34] While CONAGUA is legally subordinate to SEMARNAT, it receives approximately two-thirds of the entire budget of the sector, which encompasses SEMARNAT and all the agencies mentioned above.[35] Thus, in reality, CONAGUA tends to act independently and with limited influence from SEMARNAT.[36] This limited influence of SEMARNAT may have resulted in an interpretation of IWRM that underemphasizes the ecosystem sustainability aspect as is reflected in CONAGUA's budget, which prioritizes water supply and sewerage, with 65 percent for drinking water, sewerage, and sanitation, twenty percent for hydro-agricultural infrastructure, and only 15 percent for management and preservation.[37]

b. Regional Level

CONAGUA carries out its administrative activities in each river basin through river basin organizations (*organismos de cuenca*).[38] The Mexican government has organized the 1,471 identified river basins in the country into thirty-seven hydrological regions, and these regions are in turn grouped into thirteen hydrologic-administrative regions, each of which is administered by a river basin organization.[39] Each state has an office for the river basin organization in which it is located.[40] These river basin organizations report directly to

31. OECD ENVIRONMENTAL PERFORMANCE REVIEWS, *supra* note 30.

32. Wilder, *supra* note 20, at 5.

33. LAN art. 9. Article 9 of the LAN establishes that CONAGUA will be responsible at the federal level for water concessions or assignments under certain circumstances such as those involving international treaties or more than one state, while the applicable River Basin Organization will otherwise have this responsibility. *Id.* art. 9 frac. IX. Instead of determining which agency is specifically responsible regarding each provision of the LAN, the term "water authority" is used throughout to refer to whichever one of the agencies may be responsible according to the division of responsibilities established. *Id.* art. 20.

34. *Id.* art. 9; art. 9, frac. XIV.

35. *See* SEMARNAT, ESTADÍSTICAS DEL AGUA EN MÉXCIO 120 (2007), *available at* www.paot.org.mx/centro/boletin/agosto/estadisticas_agua_mexico_07.pdf.

36. *See* Wilder, *supra* note 20, at 5.

37. COMISIÓN NACIONAL DEL AGUA, STATISTICS ON WATER IN MEXICO 106 (2008) [hereinafter SWM 2008], *available at* http://www.conagua.gob.mx/english07/publications/Statistics_Water_Mexico_2008.pdf.

38. LAN art. 9.

39. SWM 2010, *supra* note 7, at 11, 19.

40. *See id.* at 11.

the head of CONAGUA.[41] In addition to administrative duties, such as issuing water concession titles in the basin, the organizations are responsible for formulating and proposing to CONAGUA regional water policy and the river basin water plan (*programa hídrica de la cuenca*), which should determine the availability and use of water in the region.[42]

2. State Institutions

Article 115 of the Mexican Constitution organizes each state politically and administratively by municipalities, and such municipalities are responsible for potable water, drainage, sewerage, treatment, and disposal of wastewater.[43] The organization of these responsibilities varies from state to state, but most states have their own water administration bodies, water laws, and water programs that generally regulate water supply but not environmental aspects.[44]

3. Independent Institutions

a. River Basin Councils (Consejos de Cuenca)

Independent from SEMARNAT and CONAGUA are the river basin councils (*consejos de cuenca*), which are established in each river basin or group of river basins and include representatives from the three levels of government, water users, and social organizations, in order to provide policy and technical advice to the governmental agencies.[45] These councils are intended to promote the self-management of water resources by stakeholders in each river basin; however, they are essentially advisory bodies meant to coordinate and find consensus among those stakeholders.[46] As of December 29, 2009, there were twenty-six river basin councils.[47]

b. Other Commissions and Committees

In addition, for smaller, more specific geographic zones there are river basin commissions (*comisiones de cuenca*), covering sub-river basins (according to the latest CONAGUA publication, there are thirty), river basin committees (*comités de cuenca*) for micro-river basins (there are twenty-nine), technical groundwater committees (*comités técnicos de aguas subterráneas or* "COTAS")

41. LAN arts. 12 *Bis*, 12 *Bis* 1.

42. LAN art. 3, frac. XLIII; art. 12 *Bis* 6 fracs. II-III.

43. Constitución Política de Los Estados Unidos Mexicanos [C.P.], *as amended* Diario Oficial de la Federación [DO], art. 115, 5 de Febrero de 1917; LAN art. 9, frac. XIV.

44. State laws can be found at the Chamber of Deputies website: www.diputados.gob.mx/LeyesBiblio/gobiernos.htm. The author did not do an exhaustive review of all the state laws and policies; however, none of several state laws reviewed referenced environmental use or environmental flow. State commissions are mentioned in Jesús R. Gastélum, Juan B. Valdés, & Steven Stewart, *An Analysis and Proposal to Improve Water Rights Transfers on the Mexican Conchos Basin*, 11 WATER POL'Y 79, 82 (2009), *available at* http://www.iwaponline.com/wp/01101/wp011010079.htm.

45. LAN art. 3, frac. XV.

46. *Id.;* SWM 2010, *supra* note 7, at 141.

47. SWM 2010, *supra* note 7, at 141.

for aquifers (there are eighty-one), and clean beach committees (*comités de playas limpias*) for the coastal zones (there are thirty-six).[48]

c. Irrigation Districts and Units

In Mexico, 77 percent of the water concessions for off-stream use are for agricultural purposes.[49] 18 percent of the area dedicated to agriculture in Mexico relies on irrigation.[50] To a large extent, irrigation management has been divided between irrigation districts (*distritos de riego*) for large-scale irrigation and irrigation units (*unidades de riego*) for small-scale irrigation. 54 percent of the 6.46 million hectares under irrigation in Mexico corresponds to the country's eighty-five irrigation districts established and 46 percent corresponds to around thirty-nine thousand Irrigation Units.[51] Entities managing an irrigation system or the common use of national waters must establish regulations or bylaws governing the distribution of the water granted to them in concession and keep a registry of users, which the public may consult.[52]

Originally, the federal government managed the irrigation districts,[53] but then transferred this responsibility to the users.[54] The large districts are divided into modules managed by water user associations ("WUAs").[55] WUAs are allocated water, and manage the division of the allocated waters among the users together with the hydraulic committee of the district, according to the bylaws or regulations the district and the modules adopt.[56] These associations are also responsible for financing the construction and maintenance of the irrigation infrastructure through self-sufficiency dues association members pay.[57]

Irrigation Units (sometimes referred to as "URDERALES") are agricultural areas with irrigation infrastructure and systems that cooperatives and small landowners operate.[58] They can form user associations or other producer organizations and the government will grant water concessions to such user groups. The individual members of the user groups will receive certificates that are freely transferable among members of the user group subject to the internal regulations of that Irrigation Unit.[59]

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48. *Id.* at 143.

49. SWM 2010, *supra* note 7, at 61.

50. *Id.* at 66.

51. *Id.* at 66, 92.

52. LAN arts. 51, 52.

53. SWM 2008, *supra* note 37, at 71; SWM 2010, *supra* note 7, at 88.

54. SWM 2010, *supra* note 7, at 92-93.

55. WIM H. KLOEZEN, CARLOS GARCES-RESTREPO & SAM H. JOHNSON III, INT'L IRRIGATION MGMT. INST., IMPACT ASSESSMENT OF IRRIGATION MANAGEMENT TRANSFER IN THE ALTO RIO LERMA IRRIGATION DISTRICT, MEXICO 4 (1997).

56. LAN arts. 65, 66; ROBERT R. HEARNE & JOSÉ L. TRAVA, WATER MARKETS IN MEXICO: OPPORTUNITIES AND CONSTRAINTS *7, INT'L. INST. ENV'T & DEV., Discussion Paper 97-01 (1997), *available at* http://ideas.repec.org/p/ags/iieddp/24145.html (last visited Feb. 9, 2014).

57. LAN art. 3 frac. XVIII; art. 65.

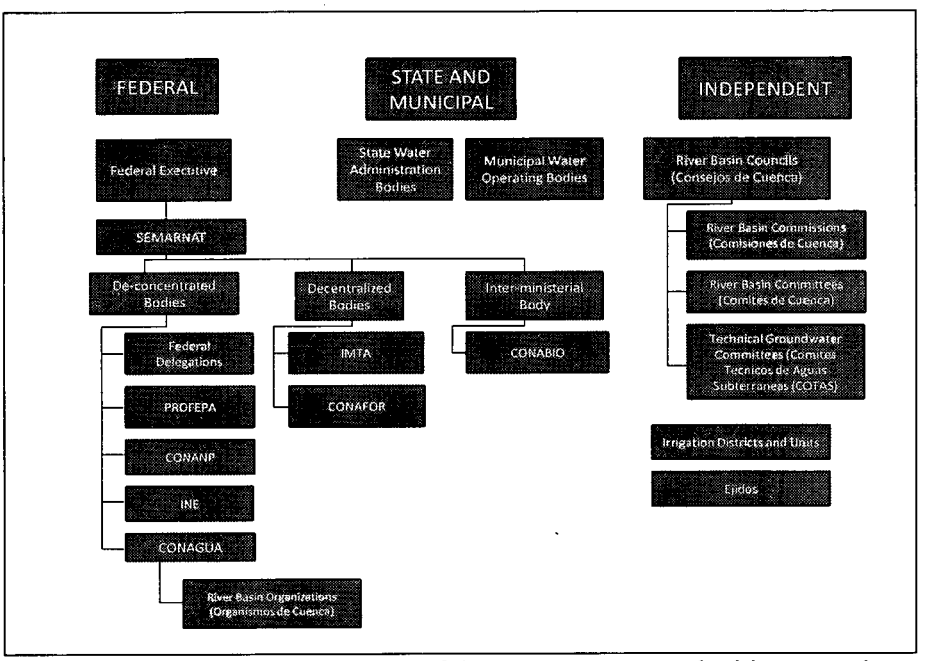
58. SWM 2010, *supra* note 7, at 94.

59. LAN art. 58; Reglamento de la Ley de Aguas Nacionales [RLAN] [Regulation of the National Water Law], *as amended,* art. 96, fracc. I, III, IV, Diario Oficial de la Federación [DO], 12 de Enero de 1994 (Mex.); SWM 2008, *supra* note 37, at 76.

d. Ejidos *and Communities*

In the case of communal land (*ejidos)* and communities (*comunidades*), which may hold land and resources in common, the government grants water concessions to the *ejido* or community, which then divides the resource among the members unless the *ejido* has determined it will allow its members to have individual ownership of their land; in that case, an individual landholder must request an individual concession.[60] An owner may transfer such water concessions with the transfer of ownership of the land.[61]

The box below provides an organizational chart prepared by the author showing the institutions mentioned above:



Having provided a brief description of the water resources, the history, and the institutions involved in the management of water in Mexico, the next section will discuss environmental flows specifically.

III. CURRENT POLICY AND LAW RELEVANT TO ENVIRONMENTAL FLOW

A. THE NECESSARY ELEMENTS

There is a growing body of literature discussing the elements necessary to successfully implement an environmental flow regime based on successes and failures in different countries.[62] A World Bank study on international experi-

60. LAN art. 14, 14 *Bis* 1.

61. *Id.* arts. 56-57.

62. *See generally* TOM LE QUESNE, ELOISE KENDY & DEREK WESTON, WORLD WILDLIFE FUND & THE NATURE CONSERVANCY, THE IMPLEMENTATION CHALLENGE: TAKING STOCK OF GOVERNMENT POLICIES TO PROTECT AND RESTORE ENVIRONMENTAL FLOWS (2010), *available at*

ence implementing environmental flows concluded that a country must integrate environmental flows into policy and legislation, river basin planning, and infrastructure projects.[63] Specifically, the study suggests that an effective implementation strategy should include a national water policy that incorporates environmental flows, legislation that gives force to the policy provisions, a strategy for implementing the policy that establishes the steps institutions need to take and the institutions responsible for taking them, and the issuance of river basin organization water programs that contain the details on how local agencies will implement environmental flows in their basin.[64] This section will discuss where Mexico stands regarding the policy and legal frameworks, specifically focusing on the legal framework.

B. THE POLICY FRAMEWORK

Mexico does not have a specific national policy or plan regarding environmental flows. Several national plans of the previous administration, however, did set forth principles that establish the basis for creating the legislation necessary to implement environmental flows. The National Development Plan 2007-2012 states that it is a priority to conserve the land and aquatic ecosystems linked to the water cycle as part of a strategy for achieving integral and sustainable management of water.[65] Additionally, the related Program of the Environmental and Natural Resources Sector 2007-2012 specifically recommends that the government publish an official standard for the determination of environmental flows (*caudal ecológico*).[66] Furthermore, one objective of the National Water Plan for 2007-2012 is to provide for the preservation of the ecosystems of the country by seeking to procure and maintain the necessary volumes in the riverbeds.[67]

Nevertheless, according to the aforementioned World Bank study, an effective environmental flow policy should include the following aspects:

> (a) legal recognition of environmental flows with, ideally, equal legal standing for consumptive water uses; (b) links between environmental flows and ecosystem services provided by the flows; (c) inclusion of all relevant parts of the water cycle, especially surface water and groundwater, when establishing envi-

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http://www.conservationgateway.org/Files/Pages/implementation-challenge-.aspx; CRAIG BELL & JEFF TAYLOR, WESTERN STATES WATER COUNCIL, WATER LAWS AND POLICIES FOR A SUSTAINABLE FUTURE: A WESTERN STATES' PERSPECTIVE (JUNE 2008), *available at* http://www.westgov.org/wswc/laws%20&%20policies%20report%20(final%20with%20cover).pdf.

63. RAFIA HIRJI & RICHARD DAVIS, THE WORLD BANK, ENVIRONMENTAL FLOWS IN WATER RESOURCES POLICIES, PLANS, AND PROJECTS, FINDINGS AND RECOMMENDATIONS 4-6 (2009), [hereinafter HIRJI & DAVIS, FINDINGS] http://siteresources.worldbank.org/INTWAT/Resources/Env_Flows_Water_v1.pdf (last visited Feb. 4, 2014).

64. *Id.* at 38.

65. *See* Plan Nacional de Desarrollo 2007-2012 [National Development Plan], Objective 4.1, Strategy 2.3, at 250 Diario Oficial de la Federación [DO], 31 de Mayo de 2007 (Mex.).

66. Programa Sectorial de Medio Ambiente y Recursos Naturales 2007-2012 [Program Sector of the Environment and Natural Resources], Objective 5.3.3, Strategy 9, at 74, Diario Oficial de la Federación [DO], 21 de Enero de 2008 (Mex.).

67. PROGRAMA NACIONAL HÍDRICA 2007-2012, CONAGUA, Strategy 15, at 61, *available at* http://www.conagua.gob.mx/CONAGUA07/Contenido/Documentos/PNH_05-08.pdf.

> ronmental flow provisions; (d) a method for determining environmental objectives and outcomes at the basin level; (e) attention to both recovery of water for the environment in over-allocated systems and protection of environmental flows in systems not yet under stress; (f) clear requirements for stakeholder participation in environmental flow decisions that do not impede progress; (g) preferably using an independent authority to audit performance of the policy; and (h) requirements for best-available science in making environmental water allocations, as long as this does not inhibit implementation of the policy requirements.[68]

Although Mexican policy recognizes the need to preserve sufficient water resources in order to protect the ecosystems they sustain and the government has taken steps toward adopting some of the above-mentioned aspects, the process is incomplete. For example, while a new regulatory standard (*Norma Mexicana* or "NMX") provides methodologies for river basins to calculate the appropriate flows for their region,[69] that does not eliminate the need for a clear national environmental flow policy and implementation strategy and adequate river basin water programs. The next section will provide a summary of the existing legal framework in order to highlight the opportunities and limitations therein for implementing environmental flows.

C. THE LEGAL FRAMEWORK

1. The National Water Law (*Ley de Aguas Nacionales* or "LAN")

a. *History and Structure*

The principal law in Mexico today governing water use is the 1992 LAN (as amended in 2004) and the 1994 National Water Law Regulations (*Reglamento de la Ley de Aguas Nacionales* or "RLAN"), to the extent they do not contradict the 2004 amendments.[70]

The LAN is divided into ten titles, which in turn are divided into chapters. Title 1 contains the definitions of terms, including the definition given to "environmental use."[71] Title 2 covers water administration, laying out the roles of the different organizations involved in water management. Title 3 addresses water policy and programming, establishing IWRM as the basis of the national water policy,[72] and recognizing the environmental services provided by water.[73]

Title 4, concerning the rights over the use of national waters, is divided into chapters on concessions and assignments, restrictions on water use, the public

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68. HIRJI & DAVIS, FINDINGS, *supra* note 63, at 79.

69. Declaratoria de Vigencia de la Norma Mexicana: NMX-AA-159-SCFI-2012 Que Establece el Procedimiento Para la Determinacion del Caudal Ecologico en Cuencas Hidrologicas [Mexican Technical Standard Establishing the Procedure for the Determination of the Environmental Flow in River Basins], Diario Oficial de la Federación [DO], 20 de Septiembre de 2012 (Mex.).

70. *See generally* LAN, *as amended,* Diario Oficial de la Federación [DO], 1 de Diciembre de 1992 (Mex.); RLAN, *as amended,* Diario Oficial de la Federación [DO], 12 de Enero de 1994 (Mex.).

71. *See* LAN, tit. 1, art. 3(LIV).

72. *See* LAN, tit. 3, art. 14 Bis 5 II.

73. *See id.*, Bis 5 XI.

registry of water rights, and transfers of water rights. This title contains the basic rules governing water use rights in Mexico.[74] Title 5 governs regulated, prohibited, and reserved zones, all of which the federal executive may establish (by presidential decree or declaration) under certain circumstances, including environmental concerns.[75] The potential use of reserved zones or a water reserve for environmental purposes will be discussed in a later section.

Title 6, on water uses, is divided into chapters on public urban use, agriculture, generation of energy, other productive activities, flood control, and water culture.[76] This Title regulates irrigation districts and units. There is no mention made in this section of environmental use.

Title 7 addresses the prevention and control of water pollution and environmental damage liability in the case of contamination of bodies of water.[77] Title 8 and an added eight *Bis* cover investment in hydraulic infrastructure and a water financing system.[78] Title 9 establishes the rules governing the public goods under CONAGUA's domain, such as river beds and banks, for which environmental groups have requested concessions in order to protect the surrounding ecosystems.[79] Title 10 sets forth the infringements, sanctions, and appeals.[80]

Finally, there are the transitory provisions, including Article 15, which states that environmental use ranks fifth among the uses of water for purposes of granting concessions.[81] As one can see, no specific section or chapter establishes the basis for implementing a sustainable water policy that includes recognition of environmental flows.

b. Environmental Flow Tools in the LAN

i. Environmental Use Context

Governments can implement environmental flows in river systems in different ways. A specific policy on environmental flows or water management that includes environmental flows can set the stage for legislation to carry out the policy. Such legislation can require that a certain regime of water flow be left in rivers to ensure the preservation of valuable ecosystems related to the river system, constituting a restriction on the determination of availability of water for concessions. This would give priority to river ecology over other uses of the water resources. For example, under section 16 of South Africa's National Water Act, the only water rights are the ecological reserve and the basic human

74. *See id.* tit. 4.
75. *See id.* tit. 5.
76. *See id.* tit. 6.
77. *See id.* tit. 7.
78. *See id.* tit. 8.
79. *See id.* tit. 9.
80. *See id.* tit. 10.
81. LAN, Articulos Transitorios Decretos de Reforma [Transitory Articles of Reform Decree], art. 15.
Diario Oficial de la Federación [DO], 1 de Diciembre de 1992 (Mex.).

needs reserve.[82] Once those reserves are established, all other uses may apply for permits for the remaining resources.[83] In the Spanish water law, environmental flows are considered as a general restriction imposed prior to any other use, and the River Basin Water Plans must establish environmental flows.[84]

Another possibility is for legislation to simply allow for the environment to compete with other uses of the water resources. An example is Australia, which does not give priority to environmental water, but does require that environmental water be given the same statutory recognition as consumptive water entitlement.[85] This sets the stage for a water market in which environmental organizations can participate in the transfer of water rights. As the rest of this article will show, current Mexican legislation includes language that seems to support both means, yet does not have all the necessary elements to carry out either one effectively.

ii. Language Supporting Environmental Flow

The LAN itself establishes certain principles on which Mexico should base the national water policy. Such principles include recognition that the conservation, protection, and restoration of water is a national security matter and that unsustainable use and adverse ecological effects must be avoided.[86] Another principle underlying the national water policy is IWRM by river basin, which, as defined in the LAN, must include the environmental aspect in order not to compromise the sustainability of vital ecosystems.[87]

According to the 2009 World Bank study, environmental flows are a central element of IWRM,[88] and are linked to it in three fundamental ways: I) the aquatic ecosystem is a water-consuming sector just like agriculture, energy, and domestic and industrial supply; II) hydraulic infrastructure affects ecosystems, both upstream and downstream of the infrastructure, and communities - farming, pastoral, and fishing - dependent on those ecosystems; and III) Multi-sector policies, laws, strategies, and plans based on allocation of water for all uses and good environmental practices facilitate IWRM planning.[89]

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82. Ralph Hamann & Tim O'Riordan, *South Africa's Policy Transition to Sustainability: Environmental and Water Law*, WATER POLICY INT'L LTD (2001), http://www.africanwater.org/SAPolicyEnv_and_water.htm (last visited Feb. 4, 2014).

83. *Id.*; *see* HIRJI & DAVIS, FINDINGS, *supra* note 63, at 70; *see also* RAFIK HIRJI & RICHARD DAVIS, ENVIRONMENTAL FLOWS IN WATER RESOURCES POLICIES, PLANS AND PROJECTS: CASE STUDIES 31 (The World Bank Report ed., 117) (April 2009) [hereinafter HIRJI & DAVIS, CASE STUDIES], *available at* http://siteresources.worldbank.org/INTWAT/Resources/Env_Flows_Water_v2.pdf.

84. Diego García de Jalón, *The Spanish Experience in Determining Minimum Flow Regimes in Regulated Streams*, 28 CAN. WATER RESOURCES J. 1, 3 (2003), http://www2.montes.upm.es/Dptos/DptoIngForestal/Hidrobiolog%EDa/Publicaciones/Minimum%20Flow%20Regimes.pdf (last visited Feb. 4, 2014).

85. Intergovernmental Agreement on a National Water Initiative, 2004, Council of Australian Governments No. 35, at 7 (Austl.), *available at* http://nwc.gov.au/__data/assets/pdf_file/0008/24749/Intergovernmental-Agreement-on-a-national-water-initiative.pdf; *see also* HIRJI, FINDINGS, *supra* note 63, at 70; HIRJI & DAVIS, CASE STUDIES, *supra* note 83, at 15.

86. LAN art. 14 *Bis* 5, frac. IX.

87. *Id.* art. 3, frac. XXIX.

88. HIRJI & DAVIS, FINDINGS, *supra* note 63, at 13.

89. *Id.* at 14.

The LAN specifically establishes that "water planning (*la programacion hidrica*) will respect environmental or ecological conservation use (*uso ambiental o de conservación ecológica*), the natural renewal quota of the waters, hydrologic sustainability of the watersheds and vital ecosystems . . . ."[90] Article 15 of the LAN states that "water planning is mandatory for the integrated management of the water resources, the conservation of national resources, vital ecosystems and the environment."[91] This article goes on to establish that planning and programming will include a National Water Program formulated by CONAGUA and approved by the Federal Executive and Water Programs for each river basin or group of river basins.[92] Article 3 XLIII of the LAN defines the River Basin Water Program as the document that determines the availability and use of the resource.[93] Thus the intention to include the environmental aspect in water planning is evident.

The LAN defines environmental use as "the minimum flow [*caudal*] or volume necessary in receptor bodies, including different kinds of currents, reservoirs, or the minimum flow of natural discharge of an aquifer, which must be conserved in order to protect the environmental conditions and the ecological balance of the system."[94] The LAN also specifically establishes that

> [T]he Federal Executive, through the Water Authority, will have the authority to deny the concession, allocation or discharge permit . . . when it affects the minimum ecological flow, which forms part of the Environmental Use referred to in Section LIV of Article 3 of this Law and in accordance with the respective regional regulations.[95]

The LAN makes reference to environmental use again in transitory article 15, which specifies that "use for ecological conservation or environmental use" is ranked fifth among water uses for the concession and assignment of the use of national waters under normal circumstances.

The RLAN defines the term "ecological conservation use," but only mentions the concept to the extent of establishing that the determination of the minimum values of the range of volumes available to irrigation districts must take into consideration uses for ecological conservation.[96]

Importantly, the LAN requires the Commission to publish the availability of national waters for each river basin, water region, or locality every three years[97] and for such purposes the government issued an Official Mexican Standard

90. LAN art. 15, frac. X.

91. *Id.* art 15.

92. *See id.*

93. *Id.* art. 3, frac. XLIII.

94. *Id.* art. 3, frac. LIV. This definition would now be considered inadequate because it does not include the quality of the water or the water flow variation regime in order to maintain the components, functions, processes, and resilience of the aquatic ecosystems that provide goods and services to society.

95. *Id.* art. 29 *Bis 5*, frac. III.

96. RLAN art. 100.

97. LAN art. 22; see also RLAN arts. 23 and 37.

(NOM), establishing the specifications and method for determining such availability. This NOM specifically states in its introduction that water requirements of the environment should be deducted before determining the amount of water that can be allocated to human use,[98] but it does not provide methods for determining the appropriate environmental flow. The NOM's transitory articles simply state "for purposes of the entrance into force of this Official Mexican Standard, the ecological allowance (*gasto ecológico*) will be determined according to the corresponding standard or the value that is determined in a specific study."[99] A relatively new technical standard, *Norma Mexicana* ("NMX"), now provides methodologies for determining environmental flow.[100] This standard is a further step toward environmental flow implementation and will be discussed in more detail below.

iii. Environmental Flow vs. Environmental Use

As demonstrated in the above review of language supporting environmental flow, the LAN contains references to the concept of environmental use (*uso ambiental*) and environmental flow (*caudal ecológico*), but fails to clearly define the terms or further regulate the concept. The LAN essentially defines environmental use as environmental flow and requires consideration of flow in water planning, but does not establish specifically how to determine environmental flow or who is responsible for the determination and implementation.

Confusing use of terminology is a further obstacle for implementing environmental flows. For example, the LAN defines the term "environmental use or ecological conservation use" (*uso ambiental* or *uso para conservación ecológica*), but then uses other terms that are not defined, such as "determined flows" (*cuadales determinados*),[101] "minimum ecological flow" (*caudal mínimo ecológico*),[102] "ecological reserve" (*reserva ecológica*),[103] "minimum flows for ecological conservation" (*flujos mínimos para la conservación ecológica*),[104] and "ecological allowance" (*gasto ecológico*).[105] It is not clear whether or not these other terms refer to the same concept of "*uso ambiental*" or have distinct meanings. The RLAN also adopts the term "ecological conservation use" (*uso para*

98. Norma Oficial Mexicana: NOM-011-CNA-2000, Conservación del Recurso Agua- Que Establece las Especificaciones y el Método para Determinar la Disponibilidad Media Anual de las Aguas Nacionales [Conservation of Water Resources- Which Establishes the Specifications and the Method for Determining the Average Annual Availability of National Waters], *as amended*, transitory art. 2, DO, 17 de Abril de 2002 (Mex.).

99. *Id.*

100. Declaratoria de Vigencia de la Norma Mexicana: NMX-AA-159-SCFI-2012, Que Establece el Procedimiento Para la Determinacion del Caudal Ecologico en Cuencas Hidrologicas [Mexican Technical Standard Establishing the Procedure for the Determination of the Environmental Flow in River Basins], Diario Oficial de la Federación [DO], 20 de Septiembre de 2012 (Mex.).

101. LAN art. 29 *Bis* 5, frac. I.

102. *Id.* frac. III.

103. *Id.* art. 86 *Bis* 1, frac. II.

104. *Id.* art. 41, frac. III.

105. NOM-011-CNA-2000, transitory art. 2.

conservación ecológica).[106] Adding to the confusion, Article 3 of the LAN defines environmental use as "the minimum flow or volume that must be conserved in bodies of water in order to protect the environmental conditions,"[107] which suggests that it is being established as a restriction on the determination of the availability of water for concessions or assignments. On the other hand, transitory Article 15 of the LAN describes environmental use as one of the possible uses of water for concessions and assignments. Thus, it is unclear whether environmental use is one more use of water that can be granted in a concession or a preliminary restriction on the volume of water available for all concessions.

Finally, Article 29 *Bis* 5 states that the Water Authority can deny a concession or assignment when it affects the minimum ecological flow[108] that forms part of the environmental use referred to in Article 3, suggesting that environmental flow is just one aspect of environmental use.[109]

Having reviewed the specific language in the law regarding environmental flows, the next section examines the basic rules governing water rights and their transfer in Mexico in order to see if Mexico could implement a water market allowing for concessions for environmental use as another means of providing water resources for environmental flows.

iv. Regulation of Concessions and Transfers

A functioning water market in Mexico could allow for the transfer of water rights for environmental purposes, especially in regions where the available water resources are already fully allocated. Even though water use rights in Mexico are not precisely property rights, the law allows for the transfer of concessions, which grants the right to use a certain volume of water. In order for a water market to function, the water rights must be well-defined, enforceable, and transferable.[110] More specifically, an efficient water market requires: (I) flexibility, allowing transfers between uses and locations; (II) security, providing an incentive for investment in essential long-term infrastructure; (III) opportunity cost, through water prices defined by a competitive market environment encouraging the most beneficial use of water; (IV) predictability, pertaining to the short-term outcome of the process; (V) equity, ensuring adequate compensation for associated externalities; and (VI) political and social acceptability, reflecting

106. RLAN art. 2, frac. XXII.

107. LAN art. 3, frac. LIV.

108. *Id.* art. 29 *Bis* 5, frac. III.

109. Under these circumstances, certain non-governmental organizations (NGOs) have themselves undertaken studies to determine the environmental flows for specific regions and then work with the local and federal authorities to try to implement them. Two examples are Pronatura and the Sonoran Institute in the Colorado River Delta, discussed further below, and World Wildlife Fund in the Conchos River Basin. *See e.g.*, J. Eugenio Barrios, J. Alfredo Rodríguez-Pineda, & Mauricio de la Maza Benignos, *Integrated River Basin Management in the Conchos River Basin, Mexico: A Case Study of Freshwater Climate Change Adaptation*, 1 CLIMATE CHANGE & DEV., 249, 252-53 (2009).

110. Richard Howitt & Kristiana Hansen, *The Evolving Western Water Markets*, 20(1) CHOICES 59, 60 (2005), *available at* http://www.choicesmagazine.org/2005-1/environment/2005-1-12.htm.

the values of society.[111] This section examines the current provisions of the law regarding the granting and transferring of concessions in order to determine the extent they encourage or discourage a water market and whether Mexico could use such a market for environmental purposes.

(a) Some Basic Rules

In Mexico, water rights have not evolved from a tradition of either prior appropriation or riparian rights. They emerge from a tradition of regulatory bodies granting volumetric rights, whether through the crown during the colonial period, local governments or appointed boards after independence, or the federal government most recently. Currently, rights are granted through concessions and registered in a Public Registry of Water Rights.

As a legal basis for this regime, Article 27 of the Mexican Constitution states that ownership of the listed waters, which includes virtually all marine and territorial waters of Mexico except water entirely deposited on one property, is vested originally in the nation and such resource is inalienable, not subject to a statute of limitation, and private citizens may only use the water through a concession the federal executive grants.[112]The Public Property Law states that the national waters as defined in the Constitution are public property and subject to eminent domain.[113] The LAN establishes that private citizens may use the waters of the nation through a concession, as defined below, or assignment ("*asignación*"),[114] which is a title granted to municipalities, states, or the Federal District to use waters for public urban or domestic water services.[115] Concessions are granted for a period from five to thirty years and may be renewed.[116] The LAN also establishes that the discharge of wastewater into bodies of water requires a discharge permit,[117] and that the water authority will keep a Public Registry of Water Rights for registering water rights and transfers.[118] Thus, in Mexico, there are three basic legal instruments used to regulate rights and obligations of water use: (I) concession or assignment titles (use of a particular volume of water from a specific water source to meet an initial off-stream use subject to specific conditions regarding the quantity and the quality of wastewater discharges), (II) permits for wastewater discharge, and (III) registration of all concession or assignment titles and transfer operations in the Public Registry of Water Rights.[119]

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111. Gastélum et al., *supra* note 28, at 85.

112. Constitución Política de los Estados Unidos Mexicanos [C.P.], *as amended,* art. 27, Diario Oficial de la Federación [DO], 5 de Febrero de 1917 (Mex.).

113. Ley General de Bienes Nacionales [LGBN] [National Property Law], *as amended,* arts. 3,6, Diario Oficial de la Federación [DO] (Mex.).

114. LAN art. 20.

115. *Id.* art. 3, frac. VIII.

116. *Id.* art. 24.

117. *Id.* art. 88.

118. *Id.* art. 30.

119. HEARNE & TRAVA, *supra* note 56, at *12-13.

(b) Priority of Uses

While the LAN's definition of environmental use suggests that environmental flows are a restriction on the availability of water resources for concession, elsewhere the LAN specifically states that domestic use and urban public use have priority in all cases,[120] including in conditions of scarcity.[121] After those two uses, river basins may determine their priorities under normal conditions with the approval of the Commission.[122] Otherwise, the priority will be as indicated in transitory Article 15 of the LAN, which lists environmental use in fifth place among thirteen uses, after domestic, urban public, livestock, and agriculture.[123] However, the relevant Water Authority may deny a concession, assignment, or discharge permit for the following reasons, among others: when granting it would imply an effect on regulated, protected, prohibited, or reserved zones, and for the preservation or reestablishment of vital ecosystems and the environment; when it would affect the minimum ecological flow according to the respective regional regulations; or when it would affect water resources allocated for the creation or maintenance of national reserves.[124]

Therefore, while under the LAN transitory Article 15 environmental use has a lower priority than domestic, urban public, livestock, and agricultural uses, it has priority over other uses such as industrial and generation of electricity, unless the Commission has approved a different order of priority in a particular river basin. Thus, presumably a request for a concession for environmental use could prevail over a request for a concession for a proposed hydroelectric dam project, for example. Similarly, an environmental organization could challenge a concession based on any effect it will have on a regulated, protected, prohibited, or reserved zone, or on any environmental flow established for a particular region.

(c) Definition of Concession

The LAN defines a concession as a title granted by the Federal Executive, through the Commission or the corresponding river basin organization, according to their respective jurisdiction, for the exploitation (*explotación*), use (*uso*), or instream use (*aprovechamiento*) of national waters and their inherent public goods (*bienes públicos inherentes*), to public or private individuals or entities, except assignment (*asignación*) titles."[125]

120. *Id.* art. 14 *Bis* 5, frac. XXII.

121. *Id.* art. 13 *Bis* 4.

122. *Id.* art. 22.

123. *Id.* transitory art. 15.

124. *Id.* art. 29 *Bis* 5, fracc. I-IX.

125. *Id.* art. 3. The following terms used in this definition are also defined in the same article of the LAN: *explotación* is defined as application of water in activities intended to extract chemical or organic elements dissolved therein, after which it is returned to its source of origin without significant consumption; *uso* is the application of the water to an activity that involves the partial or total consumption of this resource, presumably offstream uses; *aprovechamiento* is application of the water in activities that do not involve its consumption, presumably instream uses; *bienes públicos inherentes*, which are those indicated in Article 113, include the beaches and federal zones (zone ten meters wide from the riverbed of the currents or receptacle of the national deposits, measured horizontally from the maximum ordinary water level), land occupied by beds of

Thus, the definition of a concession under the LAN does not require beneficial use, an extraction, or connection to the land. However, other articles of the LAN suggest that at least extraction and connection to the land are assumed.[126] Moreover, these requirements do not take into consideration instream use, in spite of the fact that the definition of concession includes the term "*aprovechamiento*" which is defined as the non-consumptive use of water. This failure to consider instream use could potentially affect an application for an environmental use concession because environmental use may not have an extraction point, may not be consumptive, and may not be associated with any particular land area.

(d) Limitations on Concessions

General Rules and Principles

The granting of a concession is subject to the annual average availability of the water, the rights already registered in the Public Registry of Water Rights, and any river basin regulations, applicable NOMs, or decrees or declarations establishing regulated, prohibited, or reserved zones.[127] In addition, each river basin should propose to the Commission the order of preference of water uses in that river basin under normal circumstances, although domestic use and urban public use must always receive preference over any other use.[128] The Commission may revoke a concession in the case of damage to ecosystems resulting from the use of the water concession.[129]

Regulation under Conditions of Scarcity

Regarding the granting of concessions under conditions of scarcity, the Commission, through the river basin organizations and in consultation with the users through the river basin councils, will resolve temporary limitations on water rights under situations of emergency, extreme scarcity, water imbalance, overexploitation, reserve contamination and risk thereof, or when the sustainability of vital ecosystems is compromised.[130] The Commission will also determine the limitations resulting from the existence or declaration and implementation of regulated, reserved, or prohibited zones.[131] There is no system of prioritized volumetric rights or of proportional reduction.[132] In the case of irri-

lakes and other federal bodies of water, riverbeds, and federal hydraulic infrastructure. *Id.* art. 113.

126. *See id.* arts. 21, 21 *Bis*, 23.

127. *Id.* art. 22. *See generally* SWM 2010, *supra* note 7 at 125. CONAGUA is required to publish the availability of water by river basin, hydrologic region, or locality every three years. As of December 31, 2009, CONAGUA published availability for 282 hydro-geologic units or aquifers and 722 river basins. However, none of those that the author has reviewed takes into consideration or has calculated the environmental flow when determining the availability.

128. LAN arts. 13 *Bis* 4; 14 *Bis* 5, frac. XXII, 22.

129. *Id.* art. 29 *Bis* 4, frac. IX.

130. *Id.* art. 13 *Bis* 4.

131. *Id.*

132. HEARNE & TRAVA, *supra* note 56, at 7.

gation districts, when demand exceeds supply due to force majeure, the respective river basin organization will distribute the available water in accordance with the regulations of that irrigation district.[133]

Use It or Lose It

The "use it or lose it" principle applies in Mexico, whereby failure to partially or totally use the allocated waters for two consecutive years, without having a justified cause that is explicitly indicated in the LAN and its regulations, may result in the concession's invalidity (*extinción*).[134] Not only does this rule tend to discourage water use efficiency, in the hypothetical case of a concession for environmental use, if no extraction occurs, a possible challenge could exist for lack of use because neither the law nor its regulation specifically establishes an exception regarding instream use for environmental purposes. Thus, in order to make environmental use concessions operational this rule should be reconsidered.

Changes to Concession Titles and Transfers of Water Rights

Although the LAN prohibits transfers of assignments (*asignaciones)* to state and local entities for urban domestic use,[135] it allows changes to and transfers of concessions for water rights.[136] This opens the possibility of a water market that recognizes changes or transfers for environmental use. However, the current drafting of the LAN in this regard is confusing and does not lend itself to a smoothly functioning water market. For example, concession titles issued by the Water Authority must state certain information, such as the point and volume of extraction, the use, the point of discharge, etc.[137] A new concession is necessary in order to increase or permanently modify the extraction of water in volume, flow, or specific use.[138] If the volume of extraction, the point of extraction, the point of discharge, or the volume or quality of discharge changes, the LAN requires prior authorization from the Water Authority.[139]

The LAN allows the provisional or temporary transfer of water rights with prior notice to the corresponding Water Authority, as long as the concession is not modified.[140] Therefore, one hurdle for obtaining temporary transfers of concessions for environmental purposes is the prohibition on modifying the use of the allocated water the concession titles identify.[141]

Along with the above, certain other issues mentioned below could hinder the development of a robust water market in Mexico and therefore limit the potential for its use for environmental purposes:

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133. LAN art. 69.

134. *Id.* art. 29 *Bis* 3, frac. VI.

135. *Id.* arts. 20, 35.

136. *Id.* arts. 25, 33.

137. *Id.* art. 23.

138. *Id.* (stating that to increase or permanently modify the extraction of water in volume, flow, or specific use, the Water Authority must process the issuance of the respective concession).

139. *Id.* art. 25.

140. *Id.* art. 23 *Bis.*

141. *Id.* art. 23 (providing that the concession title must explicitly state the use or uses).

- limitations on transfers outside of river basins;[142]
- subsidies on agricultural and urban uses of water, which affect the ability to establish water prices defined by a competitive market that encourages the most beneficial use of water;[143]
- confusion regarding provisional (temporary) transfers of water rights, which hinders the use of leasing that many other legal systems employ as one of the most used forms of water rights transfers;[144]
- lack of specific rules for the allocation of water resources in times of scarcity, since this is left to the discretion of the applicable authorities,[145] which creates uncertainty for rights holders; and
- lack of specific rules for managing externalities or effects on third parties resulting from transfers of rights, which can lead to challenges of transfers that again create uncertainty.

On the other hand, irrigation units or districts may partially or totally change the use of water for which they have concessions as long as their internal regulations allow this. Seeing potential in the use of irrigation rights for environmental purposes, the nonprofit organization Pronatura Noroeste has pursued an expedient strategy. First obtaining concessions on certain river banks (public goods)[146] in the Colorado River Basin, the NGO then purchased irrigation rights[147] and transferred the water to irrigate the riparian vegetation.[148]

Aside from the legislative restrictions that may affect the establishment of an effective water market in Mexico, common governance[149] problems exist, such as corruption, false concession titles, a black market in water rights, and

142. *Id.* art. 34.

143. Musa Asad & Ariel Dinar, *The Role of Water Policy in Mexico: Sustainability, Equity, and Economic Growth Considerations*, 95 EN BREVE 1, 1 (Oct. 2006), *available at* http://siteresources.worldbank.org/INTENBREVE/Newsletters/21155704/Oct06_95_Mexico_Water4_EN.pdf.

144. *See* LAN art. 33; *see e.g.*, Howitt & Hansen, *supra* note 110, at 61 (providing one analysis of water markets in the western United States, and showing that, among water transfers, only 10 percent were permanent sales while 90 percent were leases of rights).

145. *See* LAN art. 13 *Bis* 4.

146. According to Article 113 of the LAN, river banks are a public good (*bien publico inherente)* under federal jurisdiction, which users may exploit by means of a concession; *see also* art. 3, frac. XLVII (defining river banks as ten meters above the ordinary maximum water level).

147. *Id.* art. 48.

148. LE QUESNE ET AL., *supra* note 62, at 51.

149. As stated in the 2006 United Nations Water Report, "governance and politics are increasingly viewed as a part of the problem and therefore as an essential part of any solution to water crises." U.N. EDUC. SCIENTIFIC & CULTURAL ORG. WORLD WATER ASSESSMENT PROGRAMME. WATER, A SHARED RESPONSIBILITY. THE UNITED NATIONS WORLD WATER DEVELOPMENT REPORT 2: EXECUTIVE SUMMARY, 7, U.N. DOC. UN/WATER/WWAP/2006/3 (2006), *available at* http://unesdoc.unesco.org/images/0014/001444/144409e.pdf. The IV World Water Forum acknowledged that there was "a crisis of governance, typified by poorly organized institutions, weak legal frameworks, limited human and financial resources, corruption and lack of transparency, and limited involvement of key stakeholders in the making of political decisions." International Institute for Sustainable Development, *World Water Forum Bulletin: A Summary Report of the 4th World Water Forum,* 82 WORLD WATER F. BULL. 15, 6 (Mar. 25, 2006).

speculation. There are also serious concerns regarding the over-concession of water rights, the extraction of volumes greater than those authorized, and the clandestine use of water resources without authorization.[150] Finally, there is the issue of administrative capacity. Transfers of water rights require the authorization of CONAGUA[151], which can take from two to three years, and then up to another year to register the transfer in the Registro Público de Derechos de Agua ("REPDA"). This only encourages the non-reporting of transfers, which further undermines the reliability of the REPDA. To the extent these problems persist, the water market will be impaired.

It should be kept in mind, however, that absent a legislative or executive change prioritizing environmental use of water, and given that many river basins are fully- or over-allocated and the only means of acquiring water rights is through a transfer of existing rights, the effective functioning of a water market would seem to be important for purposes of locating available water resources for environmental purposes.

c. Other Tools Found in the LAN

i. Public Trust

The public trust doctrine, which has its origins in Roman law, states that certain interests should not be subject to private ownership, but should instead be preserved for the benefit of all citizens, and that the state has a responsibility to protect this public interest.[152] The United States has preserved this concept through the common law public trust doctrine, which establishes that the state holds navigable waterways and submerged lands as "title held in trust for the people of the state" for uses such as commerce, navigation, and fishing.[153] Some states and federal agencies added ecological interests and preservation of wildlife habitat to the uses protected by the public trust doctrine.[154] Under this concept, citizens have filed suit against state government agencies for failure to consider the public trust when allocating water.[155]

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150. *See* CHRISTOPHER A. SCOTT, TUSHAAR SHAH & STEPHANIE J. BUECHLER, IWMI-TATA WATER POLICY PROGRAM, ENERGY PRICING AND SUPPLY FOR GROUNDWATER DEMAND MANAGEMENT: LESSONS FROM MEXICAN AGRICULTURE (2003), *available at* http://www.iwmi.cgiar.org/issues/groundwater/publications/. Also as discussed in the next section, the prohibition on water extraction in the prohibited zones is ineffective because it is not enforced. *See infra* Part III(C)(1)(c)(3).

151. ORG. FOR ECON. CO-OPERATION & DEV., OECD STUDIES ON WATER: MAKING WATER REFORM HAPPEN IN MEXICO 170 (2013).

152. J. INSTIT. 2.1.1 (J.B. Moyle trans., 1906).

153. Ill. Central R.R. Co. v. Illinois, 146 U.S. 387, 452 (1892).

154. *See* Marks v. Whitney, 491 P.2d 374, 380 (Cal. 1971) (en banc) (adding preservation of ecological units to the public interests covered by the public trust doctrine in California); Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention,* 68 MICH. L. REV. 471, 473 (1970) (discussing the inclusion of environmental protection in the Public Trust Doctrine); *see also* Carol Necole Brown, *Drinking from a Deep Well: The Public Trust Doctrine & Western Water Law,* 34 FLA. ST. U. L. REV. 1, 2 (2006) (discussing the recent developments in this area).

155. *See e.g.,* California Water Impact Network, *Public Trust, Unreasonable Use Complaint Filed With State Board,* http://www.c-win.org/groupsthreatensuit.html (last visited Nov. 20, 2013) (discussing petition filed by two environmental organizations in California with the State Water

While Mexico is a civil law country and, therefore, has no common law doctrine of this nature, its legal system also has ties to Roman law and the concept of a public trust.[156] Article 27 of the Mexican Constitution establishes the state as a trustee of the natural resources of Mexico, which must be managed for the benefit of the public as a whole.[157] This article further specifies that the nation owns the national waters, and the federal government may only grant usage to private parties through concessions issued by the federal executive.[158] It also states that the nation will have at all times the right to regulate the use, for the social benefit, of the natural elements that citizens may appropriate in order to make an equitable distribution of the public wealth and safeguard its conservation.[159]

In the LAN, the concepts of public interest and public utility embody the Roman law concept of public trust.[160] Article 7 declares that the waters are of public utility for: (I) the protection, improvement, conservation, and restoration of hydrologic river basins, aquifers, riverbeds, lake beds, and other national water deposits; (II) the reestablishment of hydrologic balance of the national waters, surface or underground; and (III) the reestablishment of the equilibrium of the vital ecosystems related to water.[161] Similarly, Article 7 *Bis* declares that the following are of public interest: (I) the full incorporation of the environmental variable and the economic and social valuation of the national waters in the nation's policies and (II) the programs and actions in relation to the management of water resources, within the scope of the institutions and society.[162]

While the law is clear that the state has the right to manage the water resources within its domain for the benefit and in the interest of the public, which interest includes the environmental variable, the laws do not explicitly provide that this right is also an enforceable responsibility of the state.[163] In order to hold the state accountable for failure to consider the public interest in its management of the resources, legislative and judicial reforms may be necessary to strengthen responsibilities and allow citizens to file suit against government agencies for failure to carry out those responsibilities.

Resources Control Board contending the Board has failed to halt the continuing ecological collapse of the San Francisco Bay-Delta estuary by permitting excessive amounts of northern California water to be pumped out for other uses).

156. *See* Jan S. Stevens, *The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right*, 14 U.C. DAVIS L. REV. 195, 197 (1980-81).

157. Constitución Política de Los Estados Unidos Mexicanos [C.P.] art. 27, *as amended* Diario Oficial de la Federación [DO], 5 de Febrero de 1917 (Mex.).

158. Constitución Política de Los Estados Unidos Mexicanos [C.P.], *as amended* Diario Oficial de la Federación [DO], art. 27, 5 de Febrero de 1917.

159. *Id.*

160. LAN art 7, art 7 *Bis* 7.

161. *Id.* art. 7, fracc. II, IV, V.

162. *Id.* art. 7 *Bis*, frac.VIII.

163. *See id.* art. 7 *Bis*, frac.VIII.

ii. Water Reserves

The LAN empowers the federal executive (the president) to issue decrees establishing regulated zones, prohibited zones, and water reserve zones.[164] The president may also declare a rescue of water volume concessions.[165] All of these are potential tools for protecting the environmental function of national water bodies. This section will discuss the water reserves and the following sections will briefly discuss each of the other concepts.

Article 41 of the LAN states that the federal executive may decree a reserve of national waters (*reserva de aguas nacionales*, also referred to as *zona de reserva*) to "guarantee the minimum flows (*flujos mínimos*) for ecological protection, including the conservation or restoration of vital ecosystems."[166] Article 78 of the RLAN adds that the federal government may use such a reserve "to guarantee minimum flows (*flujos mínimos*) that the stability of the river beds, lakes and lagoons, and the maintenance of aquatic species require[;] and [f]or the protection, conservation or restoration of an aquatic ecosystem, including the wetlands, lakes, lagoons and estuaries, as well as the aquatic ecosystems that have a historic, tourist or recreational value."[167] The establishment of these reserves requires federal executive action, although federal executive action can eliminate them just as it created them by decree.[168]

iii. Regulated Zones, Prohibited Zones, and Rescues

Section I of Article 6 of the LAN states that the federal executive is competent to issue decrees establishing, modifying, or terminating regulated zones (*zonas reglamentadas*) that require a specific handling in order to guarantee hydrologic sustainability or when the sustainability of vital ecosystems in determined areas in aquifers, river basins, or hydrologic regions is compromised.[169] Any such decree will set the volumes of extraction, use, and discharge that the Water Authority can authorize and any limits on the rights of the concession holders. In cases of extraordinary droughts, serious overexploitation of aquifers, or urgent conditions created by force majeure, the federal executive will adopt the necessary measures to control the use of national waters.[170] The author has found no reference to the establishment of any regulated zones.

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164. *Id.* art. 6, fracc. I-III.

165. LAN arts. 6, 38-43.

166. *Id.* arts. 41, frac. III. *See also id.* art 3, frac. LXIV (defining "zona de reserva" as "[r]eserve zone: [t]hose specific areas of the aquifers, watersheds or hydrologic regions in which constraints are set on the holding, use or enjoyment of a portion or all of the water available, in order to provide a public service, implement a program of restoration, conservation or preservation or where the State decides to exploit such waters for public use . . . .").

167. RLAN art. 78, fracc. III-IV.

168. LAN art. 6, frac. III.

169. *Id.* art. 6, frac. I; *see id.* art. 3, frac. LXIII (defining "zona reglamentada" as "[r]egulated zone: [t]hose specific areas of the aquifers, watersheds or hydrologic regions, showing characteristics of deterioration, water imbalance, risk or harm to water bodies or the environment, fragility of vital ecosystems, overexploitation and for reorganization and restoration require specific water management to ensure the hydrologic sustainability . . . .").

170. *Id.* art. 39.

Section II of Article 6 of the LAN empowers the federal executive to issue decrees to establish prohibited zones (*zonas de veda de aguas nacionales*),[171] prohibiting the use or extraction of national waters in cases of overexploitation, drought, extreme scarcity or situations of emergency, caused by water contamination or situations resulting from the exploitation of national waters.[172] The federal executive may issue such decrees when: I) it is not possible to maintain or increase extractions of surface or groundwater beyond a determined annual volume set by the Water Authority without affecting the sustainability of the resource and without risking harmful economic or environmental effects on the water sources of the zone in question or on the users of the resource; or II) it is necessary to prohibit or limit the uses of water in order to protect its quality in the river basins or aquifers.[173]

Water authorities have used this legal tool in Mexico now for decades. The surface water prohibitions were decreed between 1929 and 1975, and as of December 2009, 145 groundwater prohibited zones were in force.[174] In fact, water authorities have imposed prohibition zones for groundwater in about half of the country.[175]

Article 6 of the LAN establishes that the federal executive may issue declarations of rescue of water use concessions (*rescate de concesiones*) for causes of public utility or public interest, with just compensation for the expropriation.[176] The LAN defines a rescue as an act issued by the federal executive for causes of public utility or public interest through a declaration in order to extinguish concessions or assignments for the use of water.[177] Thus, the president has the authority to rescue, or cancel, water concessions already granted in the name of reestablishing the hydrologic balance in a particular region, particularly in those river basins where the water resources are over-allocated. This is another tool in the president's arsenal, like the water reserve zones, prohibited zones, and regulated zones that Mexico could use to reallocate water resources for environmental purposes. However, the author has not been able to find any evidence that this tool has been used for environmental purposes.

171. *See id.* art. 3, frac. LXV (defining "zona de veda" as "[p]rohibited zone: [t]hose specific areas of the hydrologic regions, watersheds or aquifers, where no additional uses of water are permitted to those legally established and these are controlled by specific regulations in view of water deterioration in quantity or quality, the effect on hydrological sustainability, or damage to surface or ground water . . . .").

172. *Id.* art. 39 *Bis.*

173. *Id.* art. 39 *Bis*, fracc. I, II.

174. SWM 2010, *supra* note 7, at 124.

175. *See id.* However, according to one study on the state of Guanajuato, despite the establishment of prohibited zones, the number of wells has continued to increase exponentially and the study concludes that this legal tool has not been successful in checking overexploitation. SCOTT ET AL., *supra* note 150, at 2.

176. LAN art. 6, frac. V; expropriation is regulated in the Ley General de Bienes Nacionales [National Assets Law], *as amended*, art. 52, Diario Oficial de la Federación [DO], 20 de Mayo de 2004 (Mex.).

177. LAN art. 3, frac. XLV.

iv. Water Banks

Water banks are another potential means of securing water for environmental use.[178] Article 37 *Bis* of the LAN states that the Commission may establish permanent or temporary water banks to handle regulated transactions for transferring rights[179], and the national development plan presents water banks as a means for promoting environmental sustainability.[180] The two main objectives of the water banks are: "To provide reliable, accurate and timely information on the existing supply and demand for water in a specific region, meaning in the geographic scope of the River Basin Organization, in order to make the reassignations of water rights more efficient and to foster sustainability"; and "Provide advice and guidance related with the technical and administrative aspects of the region in which the Water Bank is located, as well as the normativity applicable to the transfer of rights, in order for users to have elements for decision making and for the operations to be carried out directly with the water authority."[181] Thus, the water bank is an instrument by which CONAGUA hopes to give transparency to and facilitate the procedure for the transfer of water rights, particularly in regions with water scarcity problems. CONAGUA also envisions the banks combating the problems of forged concession titles, a black market in water, and speculation.[182] The banks apparently will not administer transfers or contract terms. The previous administration established water banks in all thirteen river basins.[183]

These water banks are not being set up for environmental purposes. The online registry and consultation database does not list the environment as one of the uses of water.[184] However, there is a policy basis for the use of banks as environmental protection tools. The National Water Program offers water banks as an economic incentive for promoting the preservation of rivers, lakes, and wetlands, while the Environmental and Natural Resources Sector Program indicates the operation of water banks as a line of action for developing incentives and economic instruments that promote the preservation of ecosystems.[185] Presumably environmental organizations could purchase water rights through the water banks for environmental use if future water bank regulations so allow.

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178. *See* WESTWATER RESEARCH & WASH. DEP'T OF ECOLOGY, WATER BANKS IN THE UNITED STATES 1, 8-12, 23 (Nov. 20, 2013), Powerpoint *available at* http://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fwww.tceq.texas.gov%2Fassets%2Fpublic%2Fcomm_exec%2Figr%2Fsa_comm%2Fwater_bks.ppt.

179. LAN art. 37 *Bis*.

180. Plan Nacional de Desarrollo 2007-2012, Objetivo 2m Diario Oficial de la Federación [DO], 31 de mayo de 2007 (Mex.).

181. NATIONAL WATER COMMISSION, WATER BANKS IN MEXICO, 51-52 (2012), *available at* http://www.conagua.gob.mx/bancosdelagua/SGAA-4-12A-English.pdf,.

182. *Id.*

183. SWM 2010, *supra* note 7, at 11, 123.

184. Registro Público de Derechos de Agua [REPDA], http://www.conagua.gob.mx/Repda.aspx?n1=5&n2=37&n3=115.

185. *See* CONAGUA, *Water Banks*, www.conagua.gob.mx/bancosdelagua (last visited Feb. 9, 2014).

v. River Basin Water Programs

In Mexico, river basin organizations are responsible for implementing water policy and law in their region. They are required, as the international literature recommends, to prepare water allocation plans identifying the rights of different groups to use water resources.[186] The literature indicates that in order for the basin plans to be effective with regard to environmental flows, they should include the following elements:[187] (I) recognition of environmental flow, (II) comprehensiveness, including surface water, groundwater, and estuaries, (III) environmental water mechanisms, including a range of environmental flow assessment (EFA) techniques for incorporating EFAs in basin-level plans[188] (IV) participation by stakeholders, (V) assessment method and data, and (VI) reviewing, monitoring and enforcement, including (i) independent oversight authority with power to levy sanctions, including fines or withholding federal funds, (ii) establishing environmental indicators and ecological monitoring programs, and (iii) following implementation, demonstrating benefits of environmental flows.[189]

State water programs and river basin or regional water programs carry out regional water planning. In a review of a few programs, the author found no specific commitment or regulation regarding environmental flows. This suggests that the regional water programs, which are the appropriate forum for determining specific environmental flows for each region, do not contain the necessary elements indicated in the first paragraph of this section to make environmental flows effective.

vi. NMX on Environmental Flows

On September 20, 2012, the Official Federal Gazette published a declaration validating the Mexican Standard NMX-AA-159-SCFI-2012, establishing the procedure for the determination of the environmental flow in river basins.[190] The scope of application of the standard states:

> [t]his Draft Mexican Standard applies to all those who carry out studies to request assignments, construct infrastructure, make transfers between river basins, similar to Environmental Impact Assessments (EIA). As well as for all currents or bodies of water whose water availability rulings published in the Official Federal Gazette (DOF), do not consider a flow for the conservation of aquatic ecosystems.[191]

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186. HIRJI & DAVIS, FINDINGS, *supra* note 63, at 38; *see* LAN art. 12 *Bis* 6, frac. III; *see also id.* art. 15, fracc. II, X.

187. *Id.* at 38, 62, 83-92.

188. *Id.* at 87.

189. *Id.* at 38, 85-88.

190. Declaratoria De Vigencia De La Norma Mexicana: NMX-AA-159-SCFI-2012 Que Establece El Procedimiento Para La Determinacion Del Caudal Ecologico En Cuencas Hidrologicas [NMX-AA-159-SCFI-2012] [Mexican Technical Standard Establishing the Procedure for the Determination of the Environmental Flow in River Basins], Diario Oficial de la Federación [DO], 20 de Septiembre de 2012.

191. NMX-AA-159-SCFI-2012, at 4.

The NMX standard provides guidance to those implementing laws, regulations, and NOMs, but its terms are not binding.

The standard defines environmental flow (*caudal ecológico*) in two different places, in the introduction and the definitions section, using different terminology. In the definitions section-presumably the official definition- the term is defined as "the quality, quantity, and regime of the flow or variation of the levels of water required to maintain the components, functions, and processes of the epicontinental aquatic ecosystems."[192] Compare this to the introduction, where the term is defined as "the quantity, quality and variation of the allowance or of the levels of water reserved to preserve environmental services, components, functions, processes, and the resilience of aquatic and land ecosystems that depend on hydrological, geomorphological, ecological and social processes."[193] The standard states that "the determination of the environmental flow shall apply to currents of each river basin and body of water as required to be able to limit the extraction of national waters, establish prohibited zones, or declare water reserves, so that they can be incorporated into decisions to grant or deny concessions and assignments of water, as well as discharge permits, within the guidelines indicated by the Water Authority."[194] The standard also states that when the current or body of water is located in river basins having no available water or considered prohibited zones, the water authority may determine the environmental flow, but cannot grant it.[195] The determination will simply permit the identification of volumes allocated to users that have an indirect environmental function when they flow through the riverbed.[196]

While the issuance of the standard is a welcome step forward and an important example of a cooperative effort between the government and non-governmental organizations, there are a number of important aspects of environmental flow implementation left undetermined. For example, it is not clear which specific agency is responsible for undertaking or commissioning the studies in each river basin; what timeframe for preparing them is allowed; what the target dates are for implementation of the environmental flows determined by the studies; how conflicts will be resolved in case of disputes over the reallocation of water; how environmental flows will be established in river basins already over-allocated; how the results of the allocation of environmental flows will be monitored, etc. Mexico will have to address these aspects in order to ensure a successful determination and implementation of environmental flows.

192. *Id.* at 5.
193. *Id.* at 2.
194. *Id.* at 3.
195. *Id.*
196. *Id.*

2. OTHER LEGAL TOOLS

a. Relevant International Conventions

Mexico is signatory to the Ramsar Convention on Wetlands ("Ramsar"), the Convention on Biological Diversity ("CBD") and the Convention on International Trade in Endangered Species ("CITES"), all of which have provisions requiring the implementation of national legislation protecting natural habitats and their species, which environmental organizations or other interested parties may use as support for implementing the protection of environmental flows.[197]

b. Mexican Laws, Regulations, and Standards

Besides the LAN and RLAN, the environmental and other laws containing provisions relevant to the water sector are briefly discussed below.

i. Framework Environmental Law

(a) Constitutional Right to a Healthy Environment

Article 4 of the Mexican Constitution guarantees the right of Mexicans to live in a healthy environment.[198] On that basis, the framework environmental law in Mexico, the Ecological Balance and Environmental Protection Law (*Ley General para el Equilibrio Ecologico y Proteccion Ambiental*, or "LGEEPA"), particularly in its chapter on sustainable use of water and the aquatic systems, lays the foundation for developing a legal regime that ensures the sustainable use of water resources and the protection of aquatic ecosystems.[199] These principles provide a legal basis for authorities to develop more specific rules on water use that take environmental impact into account.

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197. *See* Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat art. 4(2), *as amended* Jul. 13, 1994, 996 U.N.T.S. 246, *available at* http://www.ramsar.org/cda/en/ramsar-documents-texts-convention-on/main/ramsar/1-31-38%5E20671_4000_0__; Convention on Biological Diversity art. 8(d), June 5, 1992, *available at* www.cbd.int/doc/legal/cbd-en.pdf; The Convention on International Trade in Endangered Species of Wild Fauna and Flora art. VIII, Mar. 3, 1973, *available at* www.cites.org/sites/default/files/eng/disc/E-Text.pdf.

198. Constitución Política de Los Estados Unidos Mexicanos [C.P.] art. 4, *as amended*, Diario Oficial de la Federación [DO], , 5 de Febrero de 1917 (Mex.). ("All persons are entitled to an adequate environment for their development and well-being.").

199. Ley General para el Equilibrio Ecologico y Proteccion Ambiental [LGEEPA] [Ecological Balance and Environmental Protection Law], *as amended*, Diario Oficial de la Federación [DO], 28 de Enero de 1988 (Mex.); *see, e.g., id.* arts. 83; 88, frac. II ("[t]he natural resources that make up the aquatic ecosystems shall be used sustainably so as not to affect their ecological balance"), art. 88, frac. III ("[t]o maintain the integrity and balance of the natural elements involved in the water cycle, the protection of soils and forest and jungle areas and the maintenance of basic flows of the water currents (*caudales básicos de las corrientes de agua*), and the recharge capacity of the aquifers, shall be considered"), art. 89; art. 91 ("The granting of the authorizations that affect the course or normal level of the water currents will be subject to the ecological criteria contained in this Law").

(b) Infrastructure Projects

The effect of dams on river ecology is another area of major relevance for the establishment of environmental flows.[200] Article 28 of the LGEEPA requires that major infrastructure projects, including the construction of hydraulic works, carry out an Environmental Impact Assessment ("EIA") as part of the permitting process.[201] SEMARNAT reviews the EIA and based on its review, SEMARNAT will issue a resolution authorizing, conditioning, or denying authorization of the project.[202] The regulation of the LGEEPA regarding EIAs further specifies that storage dams with a capacity greater than one million cubic meters in most cases must have an environmental impact authorization from SEMARNAT.[203]

In turn, when evaluating the EIAs, SEMARNAT should consider the possible effects of the works on the ecosystems involved and the "use of the natural resources in a manner that respects the functional integrity and the carrying capacities of the ecosystems that form part of such resources," and may condition the authorization on that basis.[204] However, none of the above-mentioned documents requires that dam projects establish an environmental flow regime or include the equipment necessary to implement such a regime in order to minimize effects on the upstream and downstream ecosystems as much as possible, nor do they specifically require the carrying out of an Environmental Flow Assessment (EFA).[205]

Based on the above provisions, under current law SEMARNAT has the discretion to condition its authorization of the construction of dam projects on the conducting of an EFA, but such conditioning is not legally required.

Small-scale hydroelectric projects are another current concern. Large-scale hydroelectric projects (thirty mega-watts (MW) or larger) require both a concession from CONAGUA and an EIA for SEMARNAT. However, Article 80 of the LAN states that small-scale hydroelectric generation will not require a concession from CONAGUA.[206] Article 120 of the Regulation of the LAN originally defined small-scale production of electricity as 0.5 MW or smaller, but the May 2011 amendments changed the limit for small-scale hydroelectric to thirty

200. *See generally* HIRJI & DAVIS, FINDINGS, *supra* note 63, at 57.

201. LGEEPA, art. 28, fracc. I, VIII.

202. Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Evaluación del Impacto Ambiental [RLGEEPA re EIA], *as amended*, art. 45, Diario Oficial de la Federación [DO], 30 de Mayo de 2000 (Mex.).

203. Unless they are "located outside of fragile ecosystems, Protected Natural Areas and regions considered priorities due to their biodiversity and do not involve the flooding or removal of wooded vegetation or of human settlements, the affecting of habitat of species included in some category of protection, the shortage of water to surrounding communities, or the limitation of the free movement of natural populations, local or migratory." RLGEEPA re EIA, art. 5, frac. A.I.

204. RLGEEPA re EIA, arts. 44, frac. I-III, 45 frac. II.

205. HIRJI & DAVIS, FINDINGS, *supra* note 63, at 14 (defining EFA as a "process used to understand and define the ecosystem functions supported by the various components of flow in a river or groundwater system.").

206. LAN art. 80.

MW for consistency with the definition in Article 111 of the Regulation of the Electricity Public Service Law.[207] Thus, the generation of hydroelectric power of thirty MW or smaller does not require a water concession as long as it does not divert the water or affect either quantity or quality, and SEMARNAT would not require an environmental impact assessment since it would not be considered a major infrastructure projects.

One concern is that if no water concession or EIA is required for these projects, there is potential for unregulated growth without regional planning, which could have an overall negative impact on river basins. This problem suggests that small-scale hydropower needs to be brought under regulatory purview as well.

(c) Ecological Management Programs

Mexico's framework environmental law, LGEEPA, establishes four types of ecological management programs in environmental policy formation: country-wide, regional, local, and marine.[208] SEMARNAT is responsible for drafting the country-wide and marine programs, the states the regional programs, and the municipalities the local programs.[209] The ecological management regulation of the LGEEPA indicates specifically that such programs shall take into consideration critical habitats for the conservation of wildlife and areas of refuge to protect aquatic species.[210] Numerous coastal areas, as well as internal wetlands, have issued these programs in an attempt to ensure that development and human activities do not destroy these aquatic environments.[211]

ii. Wildlife Law

As mentioned above, Mexico is signatory to the CBD and CITES, resulting in a commitment to protect the biodiversity and flora and fauna at risk within its borders. In that regard, Mexico has enacted its own Wildlife Law (*Ley General de Vida Silvestre* or "LGVS") for the conservation of wildlife and habitat through protection and sustainable use, thereby maintaining and restoring diversity and increasing the well-being of the inhabitants of the country.[212] The government has published a list of Species at Risk, which presently includes 196 species of amphibians and 185 species of fish, most of which are endemic.[213]

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207. RLAN art. 120.

208. LGEEPA art. 19 *Bis*, fracc. I-IV.

209. *Id.* arts. 5, frac. IX; 7, frac. IX; 8, frac. VIII.

210. Reglamento de la Ley General Del Equilibrio Ecológico y la Protección al Ambiente en Materia de Ordenamiento Ecológico [RLGEEPA re Ecological Management] [Regulation of LGEEPA Applicable to Ecological Management], *as amended*, arts. 12, frac. IV, 22; frac. II(e); 43, frac. III., Diario Oficial de la Federación [DO], 8 de Agosto de 2003 (Mex.).

211. For a list of existing programs and their links, *see* SEMARNAT, *Ecological Systems Decreed*, http://www.semarnat.gob.mx/temas/ordenamiento-ecologico/ordenamientos-ecologicos-decretados (last visited Feb. 7, 2014).

212. Ley Generál de Vida Silvestre [LGVS] [Wildlife Law], *as amended*, art. 5, Diario Oficial de la Federación [DO], 3 de Julio de 2000 (Mex.).

213. Norma Oficial Mexicana NOM-059-ECOL-2001, Protección ambiental-Especies nativas de México de flora y fauna silvestres-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio-Lista de especies en riesgo [NOM-059-ECOL-2001] [Endangered Species

Article 60 of the Wildlife Law establishes that SEMARNAT will promote the conservation and protection of species and populations at risk through the development of conservation and recovery projects, the establishment of special measures for the management and conservation of critical habitat and areas of refuge to protect aquatic species.[214]

Furthermore, SEMARNAT may declare the existence of critical habitats for the conservation of wildlife, in which case the Secretary will coordinate with the owners of the property on which such critical habitats are located to establish special conservation measures that govern any public or private works on the property.[215]

Regarding aquatic environments specifically, the LGVS contains a special chapter on areas of refuge (*areas de refugio)* to protect aquatic species. These provisions allow SEMARNAT to establish, through a ministerial ruling, areas of refuge to protect aquatic environments and, therefore, native species of wildlife located within federal jurisdiction waters, the federal maritime land zone, and flood lands, "in order to conserve and contribute, through management and conservation measures, to the development of such species, as well as to conserve and protect their habitats, for which it will prepare the corresponding protection programs."[216] In the case of an area of refuge, any activities that could affect the protection, recovery, and reestablishment of the natural elements in the area of refuge are subject to the conditions established as management and conservation measures in the protection program.[217]

A comparison with the United States' Endangered Species Act (ESA) may be useful at this point. Under the ESA, if a species is listed as endangered, the EPA *must* designate, and thereby protect, the critical habitat of such species according to scientific assessment.[218] The ESA also prohibits the taking of species listed as endangered.[219] Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."[220] Harm includes "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."[221] Section 7 of the Act states that every federal agency *shall* "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence" of any threatened species, or adversely modify its designated critical habitat.[222] Furthermore, the Act allows any citizen to directly petition for the listing of a species and to file a lawsuit to enforce the ESA. A citizen may file a civil suit against any person violating the Act, including any governmental

List], Diario Oficial de la Federación [DO], 6 de Marzo de 2002 (Mex.).

214. LGVS art. 60.
215. *Id.* arts. 63, 64.
216. *Id.* art. 65.
217. *Id.* art. 69.
218. 16 U.S.C. § 1534 (1978).
219. *Id.* § 1538(a)(1)(B) (1988).
220. *Id.* § 1532(19).
221. 50 C.F.R. § 17 (2000).
222. 16 U.S.C. § 1536(a)(2) (2000).

agency, and specifically against the responsible agency to compel application of the prohibitions on taking an endangered species or where the EPA allegedly failed to list endangered species or to designate critical habitat.[223] In fact, the citizen suit has been essential in obtaining listing and habitat protection from governmental agencies, which are often subject to political pressure to limit the effects of the ESA.[224]

Specifically regarding aquatic environments, citizens and environmental groups have used the ESA in the United States in regions such as the Columbia River Basin[225] and the McKenzie River Basin[226] in the Northwest and Sacramento-San Joaquin Delta in California,[227] among others, to designate bodies or sections of water as critical habitat for endangered species. In this regard, ESA compliance and environmental flow projects may coincide.[228] In addition, the courts have interpreted section 7 to require federal agencies responsible for dam construction and operation and water allocation, such as the Bureau of Reclamation, to ensure the viability of the habitat of any listed species affected by such operations.[229] Thus, the ESA and its legal concepts (listing, critical habitat designation, prohibition on taking, jeopardy, and the citizen suit), are mandatory and thereby provide the "teeth" that allow the ESA to successfully protect endangered species and their habitat, including aquatic environments. Unfortunately, the Mexican Wildlife Law does not contain similar mandatory language.

Another legal tool to protect wildlife and its habitat that Mexico could use to implement environmental flows at specific sites is the National System of Management Units for the Conservation of Wildlife (UMAs), where authorities work with private *ejidos*, or community landholders, to conserve the natural habitat and wildlife on their lands.[230] In addition, Mexico has 154 protected natural areas administered by the Protected Natural Areas Commission (CONANP), 140 of which protect freshwater bodies.[231]

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223. *Id.* § 1540(g) (2002).

224. *See* Holly Doremus, *Adaptive Management, the Endangered Species Act, and the Institutional Challenges of "New Age" Environmental Protection*, 41 WASHBURN L.J. 50, 58, 65-66 (2001).

225. *Id.* at 66-67.

226. JOHN RISLEY, J. ROSE WALLICK, IAN WAITE, & ADAM STONEWALL, DEVELOPMENT OF AN ENVIRONMENTAL FLOW FRAMEWORK FOR THE MCKENZIE RIVER BASIN, OREGON SCIENTIFIC INVESTIGATIONS REPORT: 2010-5016, at 12-13 (2010), *available at* http://pubs.er.usgs.gov/publication/sir20105016.

227. Paul S. Weiland, *National Research Council Issues Interim Scientific Report Regarding Water Management and Endangered Species in California's Sacramento-San Joaquin Delta*, 12 A.B.A. ENDANGERED SPECIES COMMITTEE NEWSL. 2 (May 2010).

228. *See* RISLEY et al., *supra* note 226, at 12.

229. *See* Reed D. Benson, *Dams, Duties, and Discretion: Bureau of Reclamation Water Project Operations and the Endangered Species Act*, 33 COLUM. J. ENVTL. L. 1, 2 (2008); *see* Natural Resources Defense Council, v. Kempthorne, 506 F. Supp. 2d 322 (E.D. Cal. 2007).

230. LGVS art. 39.

231. *See* SEMARNAT, *Áreas Naturales Protegidas*, http://app1.semarnat.gob.mx/dgeia/informe_resumen/04_biodiversidad/cap4.html (last visited Nov. 20, 2013).

iii. Forestry and Fishing Laws

Under the Sustainable Forestry Law (*Ley General de Desarrollo Forestal Sustentable* or "LGDFS"), forestry policy in Mexico must ensure the "capture, protection and conservation of water resources and the capture of recharge of the aquifers"[232] and must include the "valuation of environmental goods and services."[233] The law also adopts the concepts of forest protection areas and the hydrologic-forest river basin.[234] Article 129 of the LGDFS states that SEMARNAT may declare areas of protection along rivers and lakes and over recharge areas and aquifers.[235] Additionally, LGDFS considers properties falling within an area of protection to perform a public interest function. In light of the above, the National Forest Commission (*Comision Nacional Forestal* or CONAFOR) recognizes these environmental services in several of its programs.[236]

The Sustainable Fishing and Aquaculture Law (*Ley General de Pesca y Acuacultura Sustentables* or "LGPAS") falls under the jurisdiction of the Agriculture Ministry (SAGARPA) with SEMARNAT responsible for certain environmental aspects. The LGPAS requires that the national fishing and aquaculture policy observe the precautionary principle in order to conserve and protect the fishing resources and the ecosystems in which they are found.[237] The Law gives SAGARPA the authority to regulate "zones of refuge" (*zonas de refugio*)[238] which it defines, in relevant part, as the demarcation of an area of water under federal jurisdiction for purposes of preserving and protecting the environment in which fishing resources live.[239]

iv. Wetlands Regulation

Mexico regulates wetlands under various legal frameworks, which include RAMSAR, LAN, the LGVS, and a specific Official Mexican Standard on coastal wetlands in mangrove zones.[240]

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232. Ley General de Desarrollo Forestal Sustentable [LGDFS] [Sustainable Forestry Law], *as amended*, art. 33, frac. VIII, Diario Oficial de la Federación [DO], 25 de Febrero de 2003 (Mex.).

233. *Id.* art. 34, frac. XIII.

234. *Id.* art. 7, fracc. II ("forested areas bordering on the federal zone and that influence the sources, currents, courses and bodies of water . . . ."), XI ("[t]he unit of physical space for planning and development, which includes the territory where the forest ecosystems are found and where the water flows by various causeways and converges in a common causeway, constituting the basic component of the forest region, which in turn is divided into sub-river basins and micro-river basins"), respectively.

235. *Id.* art. 129.

236. CONAFOR, ENVIRONMENTAL SERVICES, http://www.conafor.gob.mx/web/servicios-ambientales/ (last visited May 15, 2014).

237. Ley General de Pesca y Acuacultura Sustentables [LGPAS] [Sustainable Fishing and Aquaculture Law], *as amended*, art. 2, frac. III, Diario Oficial de la Federación [DO], 24 de Julio de 2007 (Mex.), art. 17, frac. VIII.

238. *Id.*, art. 8, frac. XII.

239. *Id.* art. 4, frac. LI. The author has not been able to determine whether or not SAGARPA has created any zones of refuge under the LGPAS.

240. LAN art. 86 *Bis*; LGVS arts. 19, 65; Que Establece las Especificaciones Para la Preservación, Conservación, Aprovechamiento Sustentable y Restauración de los Humedales

Article 3, frac. XXX of the LAN defines wetlands (*humedales*) as: the "[t]ransition zones between the aquatic and land systems that constitute temporary or permanent flood areas, subject or not to the influence of tides, such as marshes, swamps and wetlands, their limits being determined by the type of permanent or seasonal vegetation; the areas where the soil is predominantly water; and lacustrine areas or areas with permanently moist soils due to the natural discharge of aquifers."[241]

Article 86 Bis 1 then establishes that the Commission or River Basin Organizations will have the following powers, among others, in order to preserve the wetlands that are affected by the flow regimes of national waters: (I) to promote the reservations of national waters or the ecological reserves according to applicable law, for the preservation of the wetlands; (I) to propose the Official Mexican Standards for preserving, protecting and, as necessary, restoring the wetlands, the national waters that feed them, and the aquatic and hydrologic ecosystems that form part of them; and (III) to promote and, as necessary, carry out the actions and measures necessary to rehabilitate or restore the wetlands, as well as to establish a natural setting or perimeter of protection of the wetland zone, in order to preserve its hydrological conditions and the ecosystem.[242]

An Official Mexican Standard establishes the specifications for the preservation, conservation, sustainable use and restoration of the coastal wetlands in mangrove zones.[243] This standard prohibited destruction of mangrove forests, but a later amendment allowed the forests' destruction if compensated for elsewhere.[244] Subsequently, in February of 2007, Mexican lawmakers added a new article to the Wildlife Law in an effort to protect the coastal mangroves.[245] This article virtually prohibits any activities that affect the hydraulic flow or ecosystem of the mangroves.[246]

Costeros en Zonas de Manglar: NOM-022-SEMARNAT-2003 [Standard Setting the Specifications for the Preservation, Conservation, Sustainable Use and Restoration of Coastal Mangrove Wetlands], *as amended*, Diario Oficial de la Federación [DO], 10 de Abril de 2003 (Mex.); Ramsar Convention, *supra* note 197.

241. LAN art. 3, frac. XXX.

242. *Id.* art. 86 *Bis* 1.

243. NOM-022-SEMARNAT-2003 (defining coastal wetlands as "coastal ecosystems of transition between continental and marine waters, whose vegetation is characterized by being halophytes and hydrophytes, seasonal or permanent, and that depend on the continuous circulation of briny and marine water. They also include the marine regions of no more than 6 m of depth in relation to the average level of the lowest tide.").

244. Que Establece las Especificaciones Para la Preservación, Conservación, Aprovechamiento Sustentable y Restauración de los Humedales Costeros en Zonas de Manglar: NOM-022-SEMARNAT-2003 [Standard Setting the Specifications for the Preservation, Conservation, Sustainable Use and Restoration of Coastal Mangrove Wetlands], *as amended*, Specification 4.43, Diario Oficial de la Federación [DO], 7 de May de 2004 (Mex.).

245. LGVS art. 60 *Ter.*

246. *See id.* "The removal, filling, transplanting, cutting, or any other work or activity that affects the whole of the hydraulic flow of the mangroves; of the ecosystem and its zone of influence; of its natural productivity; of the natural load capacity of the ecosystem for tourist projects; of the zones of nesting, reproduction, refuge, feeding and breeding; or the interactions between the mangroves, the rivers, the dunes, the adjacent maritime zone and the corals, or that provokes changes in the ecological characteristics and services, is prohibited." *Id.*

v. Climate Change Law

The new Climate Change Law (*Ley General de Cambio Climatico*) is a framework law setting up several governmental and citizen-based organizations to address climate change and requiring federal, state and local governments to develop climate change programs in their respective jurisdictions.[247] Regarding institutions, it is important to note that the National Ecology Institute (*Instituto Nacional de Ecología* or "INE"), which has been actively involved in environmental flow research, is being replaced with the National Ecology and Climate Change Institute (*Instituto Nacional de Ecología y Cambio Climatico* or "INECC").[248] The law instructs all levels of government to execute adaptation actions in the area of water resources, including the river basin water programs.[249] All levels should prepare diagnoses of existing damages to water ecosystems and the volumes of water available. Policies of adaptation should promote the sustainable use of surface and ground water, and agencies should charge appropriate fees that incorporate the payment of the environmental services water ecosystems provide. The issuance of subsequent regulations and different levels of government programs will ultimately determine how these goals will be implemented, but this law could serve as a new impetus and support for integrating environmental flow requirements into river basin water programs.

vi. Water Trusts

Water trusts are private, usually nonprofit organizations that, through market transactions, acquire water for purposes of enhancing instream flows and protecting minimum flows.[250] While the water trust is not a concept regulated in the Mexican water law, a group of environmental organizations including Pronatura and the Sonoran Institute have created one such trust (Fideicomiso del Agua) in the Colorado River Delta.[251] The trust has acquired irrigation water rights from the Mexicali Valley irrigation districts in order to assign the water to the restoration of the Delta wetlands.[252]

c. Transboundary Water Treaties

Three countries border Mexico: the United States to the north and Belize and Guatemala to the southeast. International agreements exist among the three countries establishing the rules for the sharing of the water resources that

247. Ley General de Cambio Climatico [LGCC] [General Climate Change Law], *as amended*, arts. 29-30, Diario Oficial de la Federación [DO], 6 de Junio de 2012 (Mex.).

248. *Id.* at arts. 13-15, 22.

249. LGCC art. 29, frac. V.

250. Carol Necole Brown, *Drinking from a Deep Well: The Public Trust Doctrine and Western Water Law*, 34 FLA. ST. U. L. REV. 1, 36 (2006) (citing Janet C. Neuman & Cheyenne Chapman, *Wading into the Water Market: The First Five Years of the Oregon Water Trust*, 14 J. ENVTL. L. & LITIG. 135, 167-72 (1999).

251. Francisco Zamora-Arroyo et. al., *Collaboration in Mexico: Renewed Hope for the Colorado River Delta*, 8 NEV. L.J. 871, 875-76 (2008).

252. *Id.*

cross national boundaries,[253] but none of them contemplate the reservation of water for environmental purposes. That being said, efforts are being made within some governmental institutions and otherwise among non-governmental organizations to try to incorporate the environmental aspect into water resource management on the borders.

Regarding the U.S.-Mexican border, the 1944 Water Treaty ("the Treaty") governs the distribution of waters of the Rio Grande (Rio Bravo), Tijuana, and Colorado rivers that cross that border.[254] The Treaty specifically apportions flow volumes to each party from the Rio Grande (Rio Bravo) and Colorado rivers.[255] The Treaty created the International Boundary and Water Commission ("IBWC") to manage border water issues.[256] The IBWC has a Mexican Section and a U.S. Section, and any joint actions or reports are handled through the U.S. State Department and Mexican Foreign Relations Ministry.[257]

The Treaty establishes a list of water resource uses in order of preference for their joint use.[258] It makes no mention of environmental use, although the seventh and last on the list is "[a]ny other beneficial uses which may be determined by the Commission."[259] This suggests that the IBWC could determine environmental use to be a beneficial use.

Nonetheless, it is significant that IBWC Minute 306 of December 12, 2000, creates a conceptual framework to perform studies on the ecological impact of Colorado River flows on the riparian and estuarine ecology of the Colorado

253. A treaty between the United States and Mexico primarily governs their shared border. *See* Treaty between the United States of America and Mexico Respecting the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, U.S.-Mex., Feb. 3, 1944, 59 Stat. 1219 [hereinafter 1944 Treaty], *available at* http://www.ibwc.gov/Files/1944Treaty.pdf. Two International Commissions of Borders and Waters (Comisión Internacional de Límites y Aguas ("CILA")) handle bilateral matters regarding borders and waters on the southern border of Mexico; one for Belize and one for Guatemala. *General Information,* MEXICAN SECTION OF THE INTERNATIONAL BOUNDARY AND WATER COMMISSIONS BETWEEN MEXICO AND GUATEMALA, AND BETWEEN MEXICO AND BELIZE, http://www.sre.gob.mx/cilasur/index.php/consulado (last visited Feb. 16, 2014). In Mexico, these commissions operated under the Ministry of Foreign Relations (Secretaría de Relaciones Exteriores). *Id.* With Guatemala, there is an 1882 Border Treaty and a 1990 Treaty to Strengthen the International Commission of Borders and Waters. Treaty on the Delimitation of the Frontier between Mexico and Guatemala, Guat.-Mex., Sept. 27, 1882, 1404 U.N.T.S. 323, *available at* https://treaties.un.org/doc/Publication/UNTS/Volume%201404/v1404.pdf; Treaty to Strengthen International Boundary and Water Commission between the government of the United Mexican States and the government of the Republic of Guatemala, Guat.-Mex., July 17, 1990, 2727 U.N.T.S. 1, *available at* https://treaties.un.org/doc/Publication/UNTS/No%20Volume/48242/Part/I-48242-08000002802c7f4f.pdf. With Belize, there is an 1893 Border Treaty, and in 1993 Mexico established the CILA with Belize. Boundary Treaty, Belize-Mex., July 8, 1883, http://www.sre.gob.mx/cilasur/images/stories/tratadomexbel1893.pdf; Exchange of Diplomatic Notes for the Formation of the International Boundary and Water Commission, Belize-Mex., July 6, 1993, *available at* http://www.sre.gob.mx/cilasur/images/stories/canjenotasmexbel.pdf.

254. *See generally* 1944 Treaty, *supra* note 253, arts. 4, 10, 11, 15.

255. *Id.*

256. *Id.* art. 2.

257. *Id.*

258. *Id.* art. 3.

259. *Id.*

River Delta.[260] In this Minute, the IBWC commits to work with the environmental authorities in each government towards the "development of joint studies that include possible approaches to ensure the use of water for ecological purposes."[261] The IBWC also tasks its technical task force with examining the effect of flows on existing Colorado River ecosystems "with a focus on defining the habitat needs of fish, marine and wildlife species of concern to each country."[262] It also establishes a forum for the exchange of information among government agencies and NGOs with an interest in the affected area.[263]

Since then, as laid out in Minute 319 of November 20, 2012, an Environmental Work Group under the Commission has undertaken the task of identifying the environmental water needs for the Colorado River limitrophe and delta.[264] Based on those studies, under Minute 319 the IBWC decided to implement a binational cooperative pilot program to benefit riparian ecosystems with environmental flows, including "pulse flows" meant to restore river structure and mimic natural spring runoff conditions for which the U.S. government will provide partial funding.[265] Section 6 of this same Minute also contains other proposed environmental projects and programs.[266] This development shows a growing environmental awareness among government agencies and is a promising step toward incorporating the environment into the management of cross-border water resources. A number of non-governmental environmental organizations, including Pronatura, the Sonoran Institute, the World Wildlife Fund, and The Nature Conservancy have been instrumental in this process of raising awareness and providing data and resources for these projects.[267]

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260. International Boundary and Water Commission, *Minute 306: Conceptual Framework for United States - Mexico Studies for Future Recommendations Concerning the Riparian and Estuarine Ecology of the Limitrophe Section of the Colorado River and its Associated Delta,* 1 (Dec. 12, 2000) [hereinafter IBWC Minute 306]. The IBWC meets periodically from which meetings it issues its resolutions in relation to matters covered by the 1944 Treaty in Minutes. *See Minutes Between the United States and Mexican Sections of the IBWC,* INTERNATIONAL BOUNDARY AND WATER COMMISSION, http://www.ibwc.gov/Treaties_Minutes/Minutes.html (last visited Feb. 18, 2014).

261. IBWC Minute 306, *supra* note 260, at 2.

262. *Id.*

263. *Id.*

264. International Boundary and Water Commission, *Minute 319: Interim International Cooperative Measures in the Colorado River Basin through 2017 and Extension of Minute 318 Cooperative Measures to Address the Continued Effects of the April 2010 Earthquake in the Mexicali Valley, Baja California,* III.6 paras. 2, 4 (Nov. 20, 2012), *available at* http://www.ibwc.gov/Files/Minutes/Minute_319.pdf.

265. International Boundary and Water Commission, *Minute 319: Interim International Cooperative Measures in the Colorado River Basin through 2017 and Extension of Minute 318 Cooperative Measures to Address the Continued Effects of the April 2010 Earthquake in the Mexicali Valley, Baja California,* III.6 paras. 2, 4 (Nov. 20, 2012), *available at* http://www.ibwc.gov/Files/Minutes/Minute_319.pdf.

266. *See Id.* at III.6.c, d, g.

267. *See* GOOD NEIGHBOR ENVIRONMENTAL BOARD, EIGHTH REPORT TO THE PRESIDENT AND THE CONGRESS OF THE UNITED STATES, WATER RESOURCES MANAGEMENT ON THE U.S.-MEXICO BORDER, 22-23 (2005), *available at* http://www.epa.gov/ofacmo/gneb/gneb8threport/gneb8threport.pdf (discussing the governmental and non-governmental organizations working on border environmental issues).

3. Complaints, Claims and Court Actions

Environmental laws in Mexico provide government agencies with administrative tools to impose fines and require the remediation of environmental damages.[268] They also allow citizens to file citizen reports informing the Federal Attorney for Environmental Protection ("PROFEPA") of environmental contamination.[269] The criminal laws contemplate environmental crimes for which the government may hold both individuals and entities accountable.[270] Until recently, however, Mexican law did not provide for either class action suits or an environmental damages claim as such. Thus, citizen groups have not used the courts traditionally as recourse for redressing environmental harm. A series of new laws may begin to change that, however. In 2011 the class action suit became a possible legal recourse for environmental claims, and in 2013 both a new Amparo Law, which recognizes a legitimate collective interest, and the Environmental Liability Law came into force.[271] As mentioned previously, however, Mexican environmental laws do not provide for the citizen suit.

a. Class Action

During 2011, the class action suit (*acción colectiva*) came into effect through an amendment to Article 17 of the Mexican Constitution and several other laws.[272] A class may file a class action on behalf of groups of at least thirty people in relation to consumer protection, antitrust, or environmental claims.[273] With this new legal instrument, groups can bring environmental claims before the courts, demanding the remediation of environmental damages and the restitution of damages caused to the class, without having to show a direct legal interest or effect on property or rights. Judicial remedies of injunction and specific performance are also available under the new law.[274]

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268. *See e.g.*, LGEEPA, Title Six, arts. 189-204.

269. *Id.* art. 189.

270. Codigo Federal Penal, Title Twenty-Five, arts. 414- 423, *as amended*, Diario Oficial de la Federación [DO], 14 de Agosto de 1931 (Mex.).

271. Ley de Amparo [LA] [Amparo Law], *as amended*, art. 5, Diario Oficial de la Federación [DO], 2 de Abril de 2013 (Mex.); LFRA at 1; Decreto por el que se Reforman y Adicionan el Código Federal de Procedimientos Civiles, el Código Civil Federal, la Ley Federal de Competencia Económica, la Ley Federal de Protección al Consumidor, la Ley Orgánica del Poder Judicial de la Federación, la Ley General del Equilibrio Ecológico y la Protección al Ambiente y la Ley de Protección y Defensa al Usuario de Servicios Financieros [Decree amending and supplementing the Federal Rules of Civil Procedure, the Federal Civil Code, the Federal Law of Economic Competition, the Federal Consumer Protection Law, the Organic Law of the Judicial Power of the Federation, the General Law of Ecological Equilibrium and Environmental Protection and the Law on the Protection and Defense of Financial Services Users] [herenafter Class Action Decree], Diario Oficial de la Federación [DO], 30 de Agosto de 2011 (Mex.).

272. Decreto por el que se adiciona un párrafo tercero y se recorre el orden de los párrafos subsecuentes del artículo 17 de la Constitución Política de los Estados Unidos Mexicanos [Decree that a third paragraph is added and the order of the subsequent paragraphs of Article 17 of the Political Constitution of the Mexican United States], Diario Oficial de la Federación [DO], 29 de Julio de 2010 (Mex.); Class Action Decree, *supra* note 270.

273. Class Action Decree, *supra* note 270, art. 585, fracc. I-II.

274. *Id.* arts. 581, frac. III; 610, frac. I.

b. Amparo Law

The Amparo Law protects constitutional rights by regulating the relationship between the individual and the state.[275] Individuals affected by an act of the state can challenge that act through the amparo proceeding if they think the state has violated their constitutional rights.[276] The new Amparo Law recognizes legitimate individual and collective interests and protects environmental rights when the state affects an individual or collective right personally and directly.[277]

c. Environmental Liability Law

The new Federal Environmental Liability Law contains the first recognition under Mexican law of environmental damages independent from economic damages suffered by owners of natural resources. [278] Affected communities and non-profit environmental organizations may file claims for environmental liability.[279] The law requires the responsible party to restore the affected environment to its state prior to the damage, through restoration, reestablishment, treatment, recovery, or remediation.[280]

While these new legal resources should provide previously unavailable opportunities for pursuing environmental goals, the extent to which environmental groups or other interested parties may use them for ensuring the implementation of environmental flows remains to be seen.

d. NAFTA Commission for Environmental Cooperation Claim

Another possible venue to consider for putting pressure on the authorities is through filing a claim before the NAFTA Commission for Environmental Cooperation ("CEC"). In this regard, Articles 14 and 15 of the North American Agreement on Environmental Cooperation ("NAAEC") include procedures allowing any "non-governmental organization or person [. . .] residing or established in the territory of a Party" to make submissions to the CEC Secretariat asserting "that a Party [to the NAAEC] is failing to effectively enforce its environmental law."[281] This is a means of airing a complaint and putting pressure on the governmental agency to enforce the environmental law, but decisions of the Secretariat are not judicial decisions binding on such agency.[282]

See Addendum A summarizing the existing legal instruments in Mexico that could be used as tools for implementing environmental flows.

275. LA art. 1.
276. *Id.*
277. *Id.* art. 5.I.
278. Ley Federal de Responsabilidad Ambiental [LFRA] [Environmental Liability Law], *as amended*, art. 1, Diario Oficial de la Federación [DO], 7 de Junio de 2013 (Mex.).
279. LFRA. art. 28.
280. *Id.* art. 13.
281. North American Agreement on Environmental Cooperation, art. 14, 15, Sept. 14, 1993, 32 I.L.M. 1480, 1488.
282. *See id.*

IV. CONCLUDING REMARKS AND RECOMMENDATIONS

A. CONCLUDING REMARKS

The new administration in Mexico has an opportunity to set the stage for the sustainable use of the nation's water resources by developing an integrated water policy and legal framework crossing all sectors, and strengthening the institutions implementing those policies and enforcing the laws. This transition is the best opportunity for issuing a clear integrated water resources management policy fully incorporating the environmental aspect and reforming legislation to reflect that vision. Until such reforms are made, government officials and citizens do have the tools discussed here, albeit imperfect ones, to move the process forward for determining and ultimately implementing environmental flows As identified in this report, opportunities exist for improving the policy, legislative and institutional framework for implementing environmental flows in Mexico. The following recommendations are offered in order to more fully incorporate the environmental aspect into integrated water resources management in Mexico.

B. RECOMMENDATIONS

1) **Governance.** Addressing the factors inhibiting good governance by strengthening institutions and laws, increasing human and financial resources, building capacity, and combating corruption at all levels should be a top priority.
2) **General Water Policy.** The federal government should set forth a general water policy for the sustainable use of the nation's water resources that considers the environmental use of those resources to be a priority and enforceable against other uses. The government must structure this vision to cross all sectors, governing not just the water sector and its agencies but sectors such as agriculture and energy as well.
3) **Specific Environmental Flow Policy.** The federal executive should issue a specific federal policy on environmental flows and a strategy for their determination and implementation in order to give guidance and legitimacy to regional implementation. The policy should include the process for implementing environmental flows, who is responsible for implementation, time limits for issuing studies and implementing results, and consequences if those deadlines are not met.
4) **Legislative Reform.** The legislature should fully reform the LAN, its Regulation, and NOM 011-CNA-2000 to consistently apply principles of sustainable use of water resources and integrated water resources management. Such reforms would include clarifying the priority of environmental use; the elimination of contradictions in the terminology referring to environmental use and the concept of environmental flow; and the elimination of provisions that are

barriers to or that complicate the transfer of water rights. Environmental flow determination and implementation should be mandatory, and sanctions should apply if they are not carried out.

5) **Water Market Improvements**. Measures should be implemented to improve the accuracy of the REPDA in order to encourage the establishment of a functioning water market in which parties can acquire water for environmental use. These measures include, among others: better enforcement of concession extraction limits and of concession transfer registrations, a strategy for resolving overallocation problems, improvement in measurement infrastructure, and timely issuance of responses to requests for concession changes.
6) **River Basin Water Programs**. All thirteen River Basin Organizations should be required to issue their Water Programs, including the calculation of the necessary environmental flows in their region and the elements necessary to make environmental flow implementation effective.
7) **EFAs for Water Infrastructure Projects**. SEMARNAT should issue guidelines requiring the inclusion of an Environmental Flow Assessment in all Environmental Impact Assessments done for large-scale water infrastructure projects and issue rules requiring regional planning of small-scale dam projects.
8) **Use of Existing Legal Tools**. Government agencies and citizen organizations should continue to make use of or consider the use of existing legal tools to protect environmental flows, such as: Water Reserves, Water Rescues, Aquatic Areas of Refuge, Zones of Refuge, Water Trusts, Water Banks, and Declarations of Critical Habitat, among others. Emerging tools such as the new class action suit and environmental damages claim may also be tested.
9) **Capacity Building**. Interested parties should invest in capacity building at all levels of CONAGUA and other federal, state and local agencies, as well as among stakeholder organizations, in terms of understanding environmental flow management and enforcement.
10) **Judicial Reforms**. The introduction of class action and environmental damages suits into the Mexican legal system should provide important new tools for communities and environmental organizations to make use of the courts in pursuing environmental claims. The legislature should consider the addition of citizen suits in order to further hold governmental agencies accountable for enforcing environmental laws.

Addendum A: Existing Legal Instruments for Implementing Environmental Flows.

Agency Tools	
SEMARNAT	Areas of Refuge to protect Aquatic Species (*áreas de refugio*, LGVS art. 65-69)
	Declaration of Critical Habitat for the conservation of wildlife (LGVS art. 63-64)
	UMA or Wildlife Conservation Management Unit (*Unidades de Manejo para la Conservación de la Vida Silvestre*, LGVS art. 39)
	Ramsar Sites and enforcement of wetlands legislation (LGVS art. 60 TER; NOM-022-SEMARNAT-2003)
	Ecological Management Programs (*Ordenamiento Ecológico Territorial*, LGEEPA arts. 19-20BIS7)
	Require EFA for hydroelectric projects
CONAGUA	Denial or cancellation of concession when environmental flow affected (LAN art. 29 BIS 5)
	NOM-011-CONAGUA-2000 on water conservation
	Water Banks (*bancos de agua*, LAN art. 37BIS) for Environment
	River Basin Water Programs must respect environmental use (LAN art. 15X)
	NMX-AA-159-SCFI-2012 on determining environmental flows
CONANP	PROCER (*Programa de Conservación de Especies en Riesgo*)(Endangered Species Conservation Program)
CONAFOR	Forest Protection Area (*Areas de Protección Forestal*, LGDFS, art. 7 II)
	PSAH (*Programa de Servicios Ambientales Hidrológicos)*(Water Environmental Services Program)
SAGARPA	Zones of Refuge (*Zonas de refugio*)(LGPAS art. 8XIII)

(Continued on next page)

Citizen Tools	Concession of Water or Federal Public Goods (such as river banks) (*bienes nacionales*) for Environmental Use
	Water Trust (*Fideicomiso de agua*)
	Transfers of concessions from Irrigation Districts or Units (LAN art. 48)
Federal Executive Decrees	Water Reserves (*reserva de agua* or *zona de reserva,* LAN arts. 6 III, 41, 86 BIS I)
	Regulated Zones (*zonas reglamentadas,* LAN arts. 6 I, 39)
	Prohibition Zones (*zonas de veda,* LAN arts. 6 II, 39 BIS)
	Rescues (*rescate de concesiones,* LAN art. 6 IV)
	Public Trust (public interest/public utility) (*interes publico/utilidad public,* LAN art. 7 and 7BIS)
Legal Challenges	Citizen Complaint (*denuncia popular*)
	Amparo (constitutional claim)
	Class Action (*acción colectiva*)
	Environmental Damages Claim (*Responsabilidad Ambiental*)
	CEC Complaint

ONE STEP FORWARD AND TWO STEPS BACK: THE PROSPECTS FOR DITCH-WIDE QUANTIFICATIONS AND ALTERNATIVE TRANSFER METHODS

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INTRODUCTION

Colorado expects its population to grow by roughly one million residents every decade from now until 2040.[1] By then, the state's population will approach eight million.[2] If Colorado's water supply continues to develop at its current rate, the projected rise in population will "inevitably lead to a large transfer of water out of agriculture resulting in significant loss of agricultural lands and potential harm to the environment."[3] The greatest demand will likely be from municipal and industrial users who, under moderate assumptions of future water demand and successful completion of identified supply projects, will face a shortfall of 390,000 acre feet per year in 2050.[4]

Some have called for greater use of market-based approaches to assist in reallocating water among different users and uses.[5] Classical economic theory suggests that markets must be competitive to achieve optimal allocation of water.[6] But competitiveness assumes the presence of certain market conditions. This article explores two of these conditions: well-defined property rights and transactions costs.

For water markets to work, property rights to water must be well defined.[7] The prior appropriations doctrine is adept at describing *use-based* rights in water.[8] These proverbial "sticks" in the bundle that compose a water right specify a point of diversion, the beneficial use to which the water is applied, the place of use, and the rate of and/or amount of the diversion. Yet, the most important stick in the bundle - the quantity of water transferrable to another use- is often poorly defined under the historic consumptive use doctrine.[9] Two recent Colorado Supreme Court ("Supreme Court" or "Court") decisions, *Burlington*

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1. COLO. DEP'T. OF LOCAL GOV'T, STATE DEMOGRAPHY OFFICE, POPULATION FORECAST 2000-2040 (2012), *available at* http://www.colorado.gov/cs/Satellite/DOLA-Main/CBON/1251593346834.

2. *Id.*

3. COLO. WATER CONSERVATION BD., STATEWIDE WATER SUPPLY INITIATIVE ES-1 (2010), *available at* http://cwcb.state.co.us/water-management/water-supply planning/Documents/SWSI2010/SWSI2010.pdf [hereinafter SWSI 2010].

4. *Id.* at 5-28.

5. *See, e.g.*, TERRY L. ANDERSON & PETER J. HILL, WATER MARKETING, THE NEXT GENERATION (1997); K. William Easter, Mark W. Rosegrant & Ariel Dinar, *Formal and Informal Markets for Water: Institutions, Performance, and Constraints*, 14 WORLD BANK RES. OBSERVER 99 (1999); Ronald C. Griffin & Shih-Hsun Hsu, *The Potential for Water Market Efficiency when Instream Flows Have Value*, 75 AM. J. AGRIC. ECON. 292 (1993); Charles W. Howe, Dennis R. Schurmeier & Douglas Shaw, Jr., *Innovative Approaches to Water Allocation: The Potential for Water Markets*, 22 WATER RES. RESEARCH 439 (1986); Ronald A. Kaiser & Laura M. Phillips, *Dividing the Waters: Water Marketing as a Conflict Resolution Strategy in the Edwards Aquifer Region*, 38 NAT. RES. J. 411 (1998). *But see*, Joseph W. Dellapenna, *Markets for Water: Time to Put the Myth to Rest?*, 131 J. CONTEMP. WATER RES. & EDUC. 33, 35 (2005) (concluding that water is the "prime example of a public good for which prices cannot be set in a marketplace.").

6. *E.g.*, Thomas C. Brown, *Trends in Water Market Activity and Price in the Western United States*, 42 WATER RES. RESEARCH 1, 2 (2006).

7. *E.g.*, BRUCE AYLWARD ET AL., THE ECONOMIC VALUE OF WATER FOR AGRICULTURAL, DOMESTIC AND INDUSTRIAL USES: A GLOBAL COMPILATION OF ECONOMIC STUDIES AND MARKET PRICES 1 (2010); Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myth of Markets for Water*, 317 WM. & MARY ENVTL. L. & POL'Y REV. 317, 327 (2000).

8. Nicole L. Johnson, *Property without Possession*, 24 YALE J. ON REG. 205, 219-30 (2007).

9. *E.g.*, Lawrence J. MacDonnell, *Public Water–Private Water: Anti-speculation, Water*

Ditch Reservoir & Land Company v. Metro Wastewater Reclamation District ("*Burlington Ditch*")[10] and *In re Water Rights of Central Colorado Water Conservancy District v. Greeley* ("*Jones Ditch*"),[11] underscore the dramatic results of failure to properly quantify water rights.

In addition to well-defined property rights, low transactions costs are another prerequisite for the operation of competitive markets.[12] Colorado, perhaps more than any other Western state, scrutinizes transfers of water rights in order to prevent injury to other users.[13] Satisfying the burden of proof is a costly endeavor for an applicant; requiring engineers, lawyers, and other experts.[14] The maintenance and protection of vested rights, while undoubtedly a necessary inquiry in a change in water rights case, can introduce transactions costs that inhibit additional market activity.[15] In *Burlington Ditch* and *Jones Ditch*, the Supreme Court discussed ditch-wide quantification (also referred to as system-wide quantification) of historical consumptive use.[16] The ditch-wide quantification method has the potential to reduce transactions costs vis-à-vis traditional parcel-specific quantification. But did the Court offer enough clarity for ditch-wide quantifications to become the favored method of quantification? What are the realities of such a quantification system?

Section I of this article offers a brief overview of the history and development of Colorado's agricultural water rights, including a discussion of the Supreme Court's holdings in *Burlington Ditch* and *Jones Ditch*, two key cases from which to draw lessons related to property rights and transactions costs. Section II offers analysis of these concepts, with particular attention on the role of senior agricultural rights in meeting Colorado's future water supply demands and the importance of ditch-wide quantification as a component of a broader strategy to develop functioning water markets. Section III examines practical issues associated with the implementation of the ditch-wide quantification method, and provides preliminary suggestions on how to address these issues.

Reallocation, and High Plains A&M, LLC v. Southeastern Colorado Water Conservancy District, 10 U. DENV. WATER L. REV. 1, 3 (2006); Henry E. Smith, *Governing Water: The Semicommons of Fluid Property Rights*, 50 ARIZ. L. REV. 445, 470 (2008).

10. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645 (Colo. 2011).

11. *In re* Water Rights of Cent. Colo. Water Conservancy Dist., 147 P.3d 9 (Colo. 2006).

12. *E.g.*, AYLWARD ET AL., *supra* note 7, at 1; Bonnie G. Colby, *Transactions Costs and Efficiency in Western Water Allocation*, 72 AM. J. AGRIC. ECON. 1184, 1184 (1990).

13. COLO. REV. STAT. § 37-92-305(3)(a) (2012) (A change of water rights will be approved under the Water Right Determination and Adjudication Act of 1969 only if the change will not injuriously affect other adjudicated water rights). As used in this article, transfer or change of water right involves a change as defined in COLO. REV. STAT. § 37-92-103(5); *see also* Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46, 53 (Colo. 1999) (discussing the standards for a change in use proceeding); Colby, *supra* note 12, at 1190-91.

14. *E.g.*, PETER D. NICHOLS ET AL., WATER AND GROWTH IN COLORADO: A REVIEW OF LEGAL AND POLICY ISSUES 143, 145 (2001).

15. *Id.* at 145 (discussing the perceived preference of municipalities to acquire additional supply through the importation of foreign water which may avoid the costs associated with a change in use proceeding); Charles W. Howe & Christopher Goemans, *Water Transfers and Their Impacts: Lessons from Three Colorado Water Markets*, 39 J. AM. WATER RES. ASS'N 1055, 1058-59 (2003).

16. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645, 675-76 (Colo. 2011); *Cent. Colo. Water Conservancy Dist.*, 147 P.3d at 19-20.

I. BACKGROUND

A. COLORADO'S SENIOR AGRICULTURAL RIGHTS

Municipal water providers seek to acquire water rights historically used in agriculture, particularly rights represented by shares in mutual ditch companies that often have senior priority.[17] Such rights satisfy a key requirement for municipalities: certainty of supply.[18] Ironically, the anticipated certainty of supply that makes these rights so valuable also gives rise to great uncertainty when courts attempt to quantify the historical consumptive use associated with such rights, many of which were decreed more than a century ago.[19]

The adjudication statutes of 1879 and 1881 decreed many of the most senior water rights in Colorado.[20] The statutes required applicants to submit a "statement of claim."[21] Statements of claim included the

> name of the structure; a legal description of the point of diversion and location of the length of the ditch; the ditch's width, depth, and carrying capacity in cubic feet per second; the name of the stream supplying the ditch; the date on which work on the ditch commenced; the uses of water; the name of the owner; and an accompanying plat map showing the stream and the ditch from its point of diversion to the terminus of the claim.[22]

Like many of the early water decrees, the original decrees for the Jones Ditch and Burlington Ditch water rights did not expressly state where water application could occur or limit the number of acres irrigated under the right.[23]

These omissions are reflections of the time period. At that time, the government had not yet completed surveys of townships and sections,[24] making it difficult to identify specific land to which a water right attached. The late 19th century was also an era of rapid expansion and settlement in Colorado, which

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17. *See* DINATALE WATER CONSULTANTS, INC., AN EVALUATION OF ALTERNATIVE AGRICULTURAL WATER TRANSFER METHODS IN THE SOUTH PLATTE BASIN 59, 74 (2013) (In a survey of 23 Colorado water utilities and water providers, the three most important factors when considering water supply acquisitions include: 1) certainty and reliability in yield, 2) permanency of supply, and 3) ownership of water rights.).

18. *Id.*; SWSI 2010, *supra* note 3, at 7-18.

19. *See* David W. Baker, *Future of Ditch-Wide Change Cases in Colorado: Reducing Per-Share Water Quantities with Historical Consumptive Use Determinations Based on Unlawful Enlargement and Average Reservoir Releases:* Burlington Ditch Reservoir & Land Co. v. Metro Wastewater Reclamation Dist., *256 P.3d 645 (Colo. 2011)*, 15 U. DENV. WATER L. REV. 173, 174 (2011).

20. Act of Feb. 19, 1879, 1879 Colo. Sess. Laws 94, 99, § 19; Act of Feb. 23, 1881, 1881 Colo. Sess. Laws 142-43, § 1.

21. Act of Feb. 23, 1881, 142, § 1.

22. Gregory J. Hobbs, Jr., *Colorado's 1969 Adjudication and Administration Act: Settling In*, 3 U. DENV. WATER L. REV. 1, 6 (1999) (citing Ditch Statement and Platt of the Schuttee Ditches No. 1 and 2, Garfield County, Colorado (Aug. 6, 1887)) (on file with the Office of the Colorado State Engineer).

23. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645, 664 (Colo. 2011); *In re* Water Rights of Cent. Colo. Water Conservancy Dist., 147 P.3d 9, 11 (Colo. 2006).

24. Gregory J. Hobbs, Jr., *Colorado Water Law: An Historical Overview*, 1 U. DENV. WATER L. REV. 1, 10 (1997).

water development largely fueled and supported.[25] Federal and state laws encouraged this growth,[26] and early Colorado water law echoed this spirit of development and expansion. Early case law recognized that decrees entered under the 1879 and 1881 Adjudication Acts were not designed to limit who may use the water, but rather recognized that subsequent irrigators may join the original appropriator under the original priority.[27] Indeed, the 1879 Adjudication Act even permitted ditch owners to sell their water to other irrigators at a price set by county commissioners.[28] Lawmakers anticipated and expected expansion to other irrigators, and presumably other farms.

The historical view of senior agricultural rights as "evolving" to include other irrigators and additional acreage to foster early statehood development contrasts with the contemporary realities of water rights administration that favor rights bound by some metric, such as the intent of the original appropriator. Case law supports both approaches, although the Supreme Court generally favors the latter. In early Court decisions, volumetric limits, not specific acreage, were the measure of a water right, but the Court eventually rejected this approach.[29] In 1947, the Court overruled its prior decisions permitting irrigation of additional acreage even if users complied with the volumetric limits.[30] In the same decision, the Court adopted the current standard that limits the historical use of senior agricultural rights to the water necessary to irrigate the land the original appropriator intended to irrigate at the time of adjudication.[31]

Two years later, the Court justified this change, pointing to an implied limitation read into water rights decreed for irrigation that the extent of such rights are "measured by the needs of the land for irrigation of which the water was decreed."[32] The Court has since extended this implied limitation to all decrees,

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25. G.E. RADOSEVICH ET AL., EVOLUTION AND ADMINISTRATION OF COLORADO WATER LAW: 1876-1976 4-5 (1976).

26. *See, e.g.*, Desert Lands Act, ch. 107, 19 Stat. 377 (1877) (current version at 43 U.S.C. §§641-48 (2006)); Mining Act of 1866, ch. 262, §9, 14 Stat. 253 (1866) (current version at 43 U.S.C. §§ 661-66 (2006)); The Homestead Act of 1862, ch. 75, 12 Stat. 392, *repealed by* Pub. L. No. 94-579, tit. VII, § 702, 90 Stat. 2787 (1976); Act of Mar. 15, 1895, 1895 Colo. Sess. Laws 157-68, ch. 70.

27. *See* Oppenlander v. Left-Hand Ditch Co., 31 P. 854, 855-56 (Colo. 1892).

28. Act of Feb. 19, 1879, 1879 Colo. Sess. Laws 94-97, §§ 1-4.

29. *See, e.g.*, Hassler v. Fountain Mut. Irrigation Co., 26 P.2d 102, 103 (Colo. 1933) ("It is also the law that water appropriated and decreed may be applied to a larger or smaller acreage, and on a different kind of character of land, so long as such operation does not divert a larger quantity of water than was decreed."); Fulton Irrigation Co. v. Meadow Island Irrigation Co., 86 P. 748, 749 (Colo. 1906), *abrogated by* Enlarged Southside Irrigation Ditch Co. v. John's Flood Ditch Co., 183 P. 2d 552 (Colo. 1947) ("The mere fact that it is the intention of appellee to apply the water, diverted from its original headgate into the new headgate and new ditch, upon a larger acreage, does not even presumptively establish that more water, measured in time or quantity, will be used than was diverted through the original headgate, nor will it presumptively establish injury to the vested rights of others."); Cache La Poudre Irrigation Co. v. Larimer and Weld Reservoir Co., 53 P. 318, 321 (Colo. 1898), *abrogated by Enlarged Southside Irrigation Ditch Co.*, 183 P. 2d at 552 ("An 'enlarged use' may mean that more land is being irrigated with the same quantity of water than formerly was employed in irrigating fewer acres. It does not necessarily imply that a greater volume is required.").

30. *Enlarged Southside Irrigation Ditch Co.*, 183 P. 2d at 555.

31. *Id.* ("In fact, the acreage under irrigation is the principal basis of measurement of the use of water in the adjudication of priorities, and use on increased acreage of necessity is evidence, although rebuttable, of increased use either in volume or time.").

32. Enlarged Southside Irrigation Ditch Co. v. John's Flood Ditch Co., 210 P. 2d 982, 985

not just those for irrigation rights.[33] The source of this limitation is one of the fundamental tenets of Colorado water law - the appropriative system favors optimum use by requiring water be applied for beneficial purposes.[34] Early Colorado water laws promoted expansion of agricultural water rights to other lands, whereas contemporary decisions espouse the desire to limit the speculative use of water by confining such rights to the user's original intentions regarding the number of acres irrigated.

As municipalities and water suppliers acquire more senior agricultural rights, it is important to understand the historical context of these rights and the constraints that limited accurate definition in original decrees. This is particularly true in light of the significant evolution of water law and the technological advancements that have occurred since courts first entered many of these decrees. Accurate quantification of these rights is a critical stone in the path towards creating viable and efficient markets for water, which may help prevent the forecasted widespread dry-up of agricultural land.

At the outset, it is important to define the meaning we assign to the term "market." After all, the buying and selling of water rights is not a recent phenomenon. Municipalities have been acquiring agricultural water rights since at least the 1890s.[35] However rudimentary or inefficient markets may have been, or continue to be, markets for water do exist. Colorado is currently grappling with how to refine its approach to water markets in order to limit or eliminate the negative byproducts of water transfers, such as "buy and dry."[36]

Proposed new approaches to water transfers are generally and collectively labeled Alternative Transfer Methods ("ATMs").[37] Examples include rotational fallowing, deficit irrigation, water banks, and purchase and lease back agreements.[38] These practices result in conserved consumptive use portions available for lease. If the water court approves a change in use, the owner or lessee can use conserved water for multiple purposes. The distinction between ATMs and complete transfers of a water right from one use to another is that ATMs permit the sharing of water associated with a particular right among various types of beneficial uses. The focus is on the change in the type of use, not an actual change in ownership. For this discussion, when we refer to water markets, we refer to transfers in which several users share a given water right for multiple types of beneficial use.

As Colorado courts strive to quantify senior rights, they simultaneously struggle to reconcile the limitations of historic decrees with the factual development of these early rights.[39] The success of ATMs hinges not only on accurately

(Colo. 1949).

33. *See, e.g.*, Orr v. Arapahoe Water and Sanitation Dist., 753 P.2d 1217, 1223 (Colo. 1988); Rominiecki v. McIntyre Livestock Corp., 633 P.2d. 1064, 1067 (Colo.1981); Weibert v. Rothe Bros., Inc., 618 P. 2d 1367, 1372 (Colo. 1980).

34. *See* Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46, 54-55 (Colo. 1999).

35. *See* Strickler v. City of Colo. Springs, 26 P. 313, 315 (Colo. 1891).

36. *See* COLO. WATER CONSERVATION BD., NO/LOW REGRETS ACTION PLAN 5, 7 (2013).

37. *Id.* at 5.

38. *Id.*

39. *See* Bruce Finley, *High Colorado Court Limits Conversion of Ag Water for Municipal Use*, DENVER POST, May 31, 2011 ("The issue in these cases is what the historical use of water

quantified water rights, but also on an improved process for transferring the water rights to other uses. If we are going to attract sellers and buyers to the water market, then the cost of transferring water through ATMs must be less than other alternatives. The *Jones Ditch* and *Burlington Ditch* decisions recognize the efficiency of ditch-wide quantifications, but the results of these decisions - significant reductions in the quantity of certain senior water rights - has deterred and will likely continue to deter the use of the ditch-wide methodology.[40]

B. *JONES DITCH* AND *BURLINGTON DITCH*

The *Burlington Ditch* and *Jones Ditch* decisions serve as useful case studies that highlight the need to accurately quantify historical water rights and improve the process for transferring such rights to other uses.[41] Both decisions involve change in use applications filed by owners of senior agricultural rights seeking to change the use of the rights to either augmentation or municipal uses.[42] In change of use cases, courts protect against unlawful enlargement of a water right by limiting the quantity of water that can be changed to the amount of water historically consumed under the right.[43] Therefore, in change in use proceedings, the question of the right's historical consumptive use is a necessary inquiry.[44]

The effect of the Court's ruling in the *Jones Ditch* and *Burlington Ditch* decisions was to significantly reduce the area served by senior water rights, and thus significantly reduce the quantity of water associated with such rights.[45] In both instances, the Court's interpretation of the original appropriators' intent formed the basis of the its holding.[46]

i. *Jones Ditch*

Consider the *Jones Ditch* case. William R. Jones was an early settler of northern Colorado, who claimed land three miles northwest of Greeley along

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is. That's a very difficult thing to prove. Old decrees were imprecise. Measurement was imprecise. As the value of water increases, the challenge of finding just how much a person's or district's water right might have been in the past is very difficult.") (quoting the late University of Colorado Law School Dean David Getches), *available at* http://www.denverpost.com/ci_18176361#.

40. *See* DINATALE WATER CONSULTANTS, INC., *supra* note 17, at 31-32 (discussing the results of a survey of FRICO shareholders in connection with their preferences for alternative transfer mechanisms in which many respondents were reluctant to consider ATM transfers).

41. *See id.* at 103-04.

42. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645, 655 (Colo. 2011); *In re* Water Rights of Cent. Colo. Water Conservancy Dist., 147 P.3d 9, 12 (Colo. 2006).

43. *See* Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46, 54-55 (Colo. 1999).

44. Williams v. Midway Ranches Prop. Owners Ass'n, Inc., 938 P.2d 515, 522 (Colo. 1997) ("When a determination of historic usage has not previously been made, the water right must be quantified to effectuate a change or augmentation-plan case.").

45. *Burlington Ditch*, 256 P.3d at 665-67; *Cent. Colo. Water Conservancy Dist.*, 147 P.3d at 14, 16.

46. *Burlington Ditch*, 256 P.3d at 665-67; *Cent. Colo. Water Conservancy Dist.*, 147 P.3d at 14, 16.

the Cache la Poudre River ("Poudre River").[47] Shortly after his arrival, he initiated construction on the Jones Ditch to divert water so that he could irrigate the fertile bottomlands between the Poudre River and a line of bluffs to the south.[48] Mr. Jones adjudicated the ditch that bore his name in 1882.[49] During that adjudication, Mr. Jones testified that he owned approximately 300 acres, and that up until the time of adjudication, he had irrigated only those 300 acres.[50] The court entered a general decree allowing Mr. Jones to divert 931 cubic feet per minute for irrigation ("Jones Ditch Water Right").[51]

In the years following entry of the decree, Mr. Jones and his successors in interest continued development of the ditch.[52] From 1920 to 2006, the Jones Ditch consistently irrigated at least 700 acres.[53] The Jones Ditch Company, incorporated in 1944, holds the Jones Ditch Water Right for the benefit of its shareholders.[54] Eventually, the Central Colorado Water Conservancy District ("Central") came to own 139 of the 200 outstanding shares in the Jones Ditch Company.[55]

In 2000 and 2002, Central sought to change the use of seventy-seven of its shares from domestic and irrigation uses to irrigation, augmentation, replacement, exchange, and recreation with a right to use the consumable portion of the water right.[56] Thus, the lawful historic consumptive use of the water right was at issue.[57] Central claimed that the Jones Ditch Water Right extended to the amount of water used to irrigate the approximately 700 acres since 1920.[58] Opposers claimed Central's interpretation represented an unlawful enlargement of the Jones Ditch Water Right.[59] The District Court, Water Division No. 1 ("Water Court") agreed with the opposers.[60] On appeal, the Colorado Supreme Court affirmed.[61]

The Supreme Court found that Mr. Jones' testimony in the original adjudication - in which he stated that he owned "at least 300 acres that lie under the ditch on the same side of the river that can be irrigated from this ditch" and that he had "irrigated all of this land that needs irrigation" - was dispositive to its determination.[62] This statement, made over 120 years prior to Central's change in use application, proved fatal for Central. Both the Water Court and the Supreme Court interpreted the original appropriator's statement to indicate that

47. Applicant's Trial Brief at ¶ 5, Cent. Colo. Water Conservancy Dist., 147 P.3d 9 (Colo. 2006).
48. *Id.*
49. *Cent. Colo. Water Conservancy Dist.*, 147 P.3d at 11-12.
50. *Id.* at 12.
51. *Id.* at 11.
52. *Id.* at 12.
53. *Id.*
54. *Id.*
55. *Id.*
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. *Id.*
61. *Id.* at 14.
62. *See id.* at 17.

the Jones Ditch Water Right was an absolute water right.[63] Thus, both the Water Court and Supreme Court concluded that the expansion of acreage - from the original estimation of 300 acres to the 700 acres Central claimed- constituted an unlawful expansion of the Jones Ditch Water Right.[64]

While the Water Court determined the extent of Central's water right on a per-parcel basis,[65] the Supreme Court opted, and stated its preference, for a ditch-wide analysis.[66] Under a ditch-wide approach, a court quantifies the entire water right of a mutual ditch company and then allocates the water right among the shareholders of the company according to their pro rata ownership of shares.[67] This approach contrasts with a parcel-specific (or parcel-by-parcel) approach, which quantifies consumptive use for the shares sought to be changed to new uses without extending that value of consumptive use to other shares in the same ditch company.[68] When a change in use applicant seeks a change in use pursuant to a parcel-by-parcel approach, the historic consumptive use per changed share is generally not binding on other shareholders in that ditch company; shareholders seeking a subsequent change in use must proceed to establish the historic consumptive use with respect to the shares they wish to change.[69] The law permits either a per-parcel or ditch-wide methodology, but the Court stated that "[d]itch-wide analyses are preferable" because "they prevent expensive re-litigation of consumptive use."[70] The Court also prefers ditch-wide analyses because such an approach is consistent with the pro rata operation of mutual ditch companies.[71]

Application of the ditch-wide approach in *Jones Ditch* rendered the seventy-seven shares Central sought to change valueless.[72] As discussed below, that result may ultimately compel, and in the opinion of the authors has already compelled, applicants in change of use cases to avoid ditch-wide quantification.

ii. *Burlington Ditch*

In many respects, *Jones Ditch* was a prequel to the more recent *Burlington Ditch* decision. Like the Jones Ditch Water Right, water rights associated with the Burlington Ditch, Reservoir and Land Company ("Burlington") are among

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63. *Id.* at 12, 14.

64. *Id.*

65. *Id.* at 13.

66. *Id.* at 18-19.

67. *Id.* at 19. (citing Great W. Sugar Co. v. Jackson Lake Reservoir & Irrigation Co., 681 P.2d 484, 490 (Colo. 1984)).

68. *See id.* at 12-13. (The Water Court, deciding to leave undisturbed a 1992 Decree in which it awarded Central 401.4 acre-feet of consumptive use per year based on its ownership of 62 additional shares, opted for a parcel-specific analysis in which it determined the historical consumptive use of the shares Central sought to change by analyzing the amount of water that was historically used to irrigate 37 acres owned by Central. The Water Court awarded Central 66.65 acre feet pursuant to a parcel-specific approach).

69. *See id.*

70. *Id.* at 19.

71. *See id.* at 18. (In its opinion, the Colorado Supreme Court states that "shares of stock in a mutual ditch company represent the stockholder's interest in the ditch water right" and then discusses the allocation of a mutual ditch company's water right among its shareholders pro rata.).

72. *See id.* at 19-20.

the most senior rights in Colorado, with a priority date of 1885.[73] Though the Colorado Supreme Court in *Burlington Ditch* addressed many substantive issues, quantification of historical consumptive use was again a requisite inquiry in this change of use case.[74] Like *Jones Ditch*, the outcome of *Burlington Ditch* was a dramatic reduction in the historical consumptive use of senior water rights.

Burlington, incorporated in November 1885,[75] began construction of the Burlington Ditch around the same time.[76] A decree, entered in 1893 in Case No. 11200 ("1893 Decree"), provided the company a priority date of November 25, 1885 for a direct flow right of 350 cubic feet per second ("cfs") from the South Platte River ("Burlington 1885 Direct Flow Right") and a storage right in Barr Lake and Oasis Reservoir to be filled at 350 cfs ("Burlington 1885 Storage Right").[77]

The district court that entered the 1893 Decree adopted the referee's finding, which identified 12,000 acres capable of irrigation between the Burlington headgate and Barr Lake and Oasis Reservoirs, as well as 28,000 acres of lands susceptible to irrigation below these storage facilities.[78] The decree went on to describe, now almost notoriously, that the amount of acreage that the ditch could serve was "unlimited as it may continue to the eastern line of Colorado."[79] From 1885 until 1909, Burlington diverted approximately 200 of the 350 cfs of the Burlington 1885 Direct Flow Right for irrigation of lands *above* Barr Lake.[80]

In 1909, Farmers Reservoir and Irrigation Company ("FRICO") contracted with Burlington for water "in excess of those rights [that] entitled the Burlington Company to fill Barr/Oasis . . . and in excess of the water now obtained and used for direct irrigation."[81] Diversion records showed this amount of "excess water" was roughly the 150 cfs not then used by Burlington.[82] FRICO delivered this water for irrigation of lands *below* Barr Lake.[83] It was around this time that FRICO began expanding the Burlington system, adding nearly 140 miles of new canals as part of its Barr-Lake Division.[84] The district court granted FRICO a 1908 priority in the expanded Burlington Canal for 600 cfs from the South Platte.[85]

As part of a 2004 water court application, FRICO, Burlington, Henrylyn Irrigation District, United Water and Sanitation District, and East Cherry Creek Valley Water and Sanitation District applied for a change in use from irrigation

73. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645, 656 (Colo. 2011).

74. *Id.* at 662.

75. JAMES E. SHEROW, A HISTORICAL NARRATIVE OF THE BURLINGTON DITCH: RESERVOIR AND LAND COMPANY 2 (1987), http://www.burlingtonres.com/history.htm.

76. *Burlington Ditch*, 256 P.3d at 656.

77. *Id.*

78. *Id.*

79. *Id.*

80. *Id.* at 656-57.

81. *Id.* at 657.

82. *Id.*

83. *Id.*

84. *Id.* at 657-58.

85. *Id.* at 657.

to municipal use of Burlington and FRICO water rights historically used to irrigate farms below Barr Lake.[86] As in any change in use case, the analysis necessarily included a determination of the historical consumptive use of the Burlington 1885 Direct Flow Right. The Water Court held FRICO's expansion of the Burlington system unlawful, and calculated the lawful historical consumptive use of the Burlington 1885 Direct Flow Right as the 200 cfs Burlington put to beneficial use prior to FRICO's expansion.[87]

Relying in part on *Jones Ditch*, the Colorado Supreme Court affirmed and held that the application of water to additional acreage, resulting in increased consumptive use above that perfected under the decreed appropriation, was unlawful.[88] In interpreting the nearly 120-year old decree, the Supreme Court deferred to the Water Court's finding that there was no evidence that Burlington intended to irrigate lands below Barr Lake with the Burlington 1885 Direct Flow Right.[89] The Supreme Court addressed the apparent discrepancy between its holding and the original 1893 Decree, which permitted Burlington to divert up to 350 cfs, by concluding that a "diversion flow rate in a decree is neither the measure of a matured water right, nor conclusive evidence of the appropriator's need for which the appropriation was originally made."[90]

As in *Jones Ditch*, the Court in *Burlington Ditch* analyzed historical consumptive use according to a system-wide approach.[91] Several parties challenged the Water Court's ditch-wide quantification of shares not identified in the application.[92] The Supreme Court affirmed the Water Court's approach, concluding that the resume notice was sufficient to place other Burlington and FRICO shareholders on inquiry notice that the action may potentially affect their rights, and that the Water Court had proper in rem jurisdiction over all water rights under the ditch because such rights were "put at issue" by the change application.[93]

II. ANALYSIS

Colorado is seeking to accomplish what appear to be competing goals in water management. Colorado seeks to preserve its agricultural heritage along with that sector's contribution to the state's economy, while concurrently acknowledging that transfers of water out of agriculture are likely to fill the projected municipal and industrial ("M&I") supply "gap".[94] Additional transfers of water out of agriculture seem inevitable. But the manner in which owners transfer water rights is a policy variable upon which there is some control.

The case for policy change is an easy one to make. To protect vested water rights holders, water courts may impose the dry-up of previously irrigated land

86. *Id.* at 653-55.
87. *Id.* at 655.
88. *Id.* at 664-65.
89. *Id.* at 664.
90. *Id.* at 665.
91. *See id.* at 675.
92. *Id.* at 675.
93. *Id.* at 675-76.
94. *See* SWSI 2010, *supra* note 3, at ES-8 and ES-16-17.

as a condition to granting a change in use.[95] Due to either dry-up covenants or urban encroachment, between 500,000 and 700,000 additional irrigated acres in Colorado could be dry by 2050.[96] This has real economic consequences to the state. Depending on the region and crops grown, the average economic activity generated per irrigated acre can range from $335 to over $1200.[97] When lands are permanently removed from irrigated agriculture, the ripple effects can be distressing to rural communities.[98] In addition to being a vibrant market for the state,[99] agriculture also supports soil conservation, recreational opportunities, and cultural values.[100] With the fate of many rural communities inextricably tied to agriculture, and thus water, it is no surprise that there is a growing divide among Colorado water users.[101]

While reallocation of water from agriculture to other uses makes up only one leg of the so-called "four-legged stool" to meet projected future water demands in the state, such transfers comprise a considerable portion of Colorado's future water supply portfolio.[102] The Water Right Determination and Adjudication Act of 1969 ("1969 Act") permits various types of temporary transfers with administrative approval.[103] However such transfers may only operate within well-defined time periods, thereby potentially constraining their ability to facilitate sufficient water trading to address the M&I gap.[104] In addition to these

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95. *See, e.g.*, City of Thornton v. Bijou Irr. Co., 926 P.2d 1, 87-88 (Colo. 1996).

96. SWSI 2010, *supra* note 3, at 4-32.

97. JENNIFER THORVALDSON & JAMES PRITCHETT, COLO. WATER RES. INST., REPORT NO. 207, ECONOMIC IMPACT ANALYSIS OF REDUCED IRRIGATED ACREAGE IN FOUR RIVER BASINS IN COLO. 40 (2006).

98. *See* Howe & Goemans, *supra* note 15, at 1062-63 (discussing the economic impacts, including losses in employment, income, and tax revenue, in the Arkansas Valley of dry up associated with transfers of water from agriculture to municipalities); Charles W. Howe, Jeffrey K. Lazo, & Kenneth R. Weber, *The Economic Impacts of Agriculture-to-Urban Water Transfers on the Area of Origin: A Case Study of the Arkansas River Valley in Colorado*, 72 AM. J. OF AGRIC. ECON. 1200, 1200-04 (1990).

99. *See generally* STEPHEN DAVIES, AMALIA DAVIES, BECKY GOLDBACH, & MARTHA SULLINS, COLO. STATE UNIV., COLO. DEP'T OF AGRIC., THE CONTRIBUTION OF AGRICULTURE TO COLORADO'S ECONOMY: AN EXECUTIVE SUMMARY 1-4 (2012), *available at* http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=ContentDisposition&blobheadername2=Content-Type&blobheadervalue1=inline%3B+filename%3D%22CSU+Executive+Summary.pdf%22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251833847153&ssbinary=true.

100. *See, e.g.*, Randall S. Rosenberger & Richard G. Walsh, *Nonmarket Value of Western Valley Ranchland Using Contingent Valuation*, 22 J. AGRIC. & RES. ECON. 296, 296 (1997).

101. *See generally* Sandra K. Davis, *The Politics of Water Scarcity in the Western States*, 38 SOC. SCI. J. 527, 534 (2001) (discussing the factors that contribute to conflict over water).

102. *See* SWSI 2010, *supra* note 3, at 7-5 and 7-6.

103. COLO. REV. STAT. § 37-92-308(4)(a)-(c) (2012).

104. *Id.* (Recognizing that the time required to go through the water court adjudication process can be problematic for some water users, the general assembly has authorized the use of substitute water supply plans ("SWSP") to effect change applications under certain circumstances. If an applicant has filed a change of water right application with the water court and the court has not yet issued a decree in that matter, the applicant may request the state engineer to approve the temporary operation of such change in water right. If the state engineer determines, after receiving comments from the opposers in the pending water court application, that the SWSP will replace all out-of-priority depletions in time, location, and amount, and will otherwise prevent injury to other appropriators, then the state engineer will approve the SWSP for a period of up to one year); *see also* §§ 37-92-308(5)(a)-(c) (A SWSP may be approved, even without a pending

statutory transfer methods, creating markets for water leasing is one approach that warrants attention. Markets are not a remedy to all water scarcity problems,[105] but there is evidence that market signals are already affecting allocation decisions.[106]

Can current water transfer methods be improved to foster transactions that meet M&I demand and curtail the buy and dry trend? The Colorado Water Conservation Board ("CWCB") has begun to address this question through its ATM grant program.[107] The ATM studies underway point towards the development of promising concepts, many of which address the need to create incentives for water leasing. For reasons discussed below, *Jones Ditch* and *Burlington Ditch* hold lessons on the eventual efficacy of many of the ATM models.

A. PROPERTY RIGHTS

In any given transaction, property rights define the value of what is exchanged.[108] Water rights in Colorado challenge categorization, often straddling the line between a private property right and a public good.[109] The public nature of water is cemented in the Colorado Constitution.[110] However, the prior appropriation system recognizes usufructuary rights in water held by private individuals and entities.[111] The act of appropriation, through control and application of water to a beneficial use, entitles the appropriator to make use of that amount of water in subsequent years.[112]

The extent of the private right to use water, like many other natural resources, is limited and presents a unique bundle of rights.[113] These rights are subject to the well-established condition that the water must be applied to a non-speculative use.[114] The right holder must continue to divert water once there is lawful appropriation, or risk a finding of abandonment (commonly known as the "use it or lose it" condition).[115] Adjudicated water rights give the appropriator the right to the continued use of a certain amount of water at a specified

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change in water right application in water court, for a limited duration of up to five years); § 37-92-309 (Interruptible water supply agreements ("IWSA") allow for approval by the state engineer of temporary transfers of the consumptive use portions of absolute water rights to another beneficial use, without adjudication, if the proponent can prove the agreement will not cause injury to other appropriators. An IWSA can be exercised in no more than three years in a ten year period).

105. *See* Dellepenna, *supra* note 5, at 36-37 (discussing exernalities in water markets); Howe, Schurmeier & Shaw, Jr., *supra* note 5, at 441 (discussing exernalities in water markets).

106. Jedidiah Brewer, Robert Glennon, Alan Ker, & Gary Libecap, *2006 Presidential Address Water Markets in the West: Prices, Trading, and Contractual Forms*, 46 ECON. INQUIRY 91, 105 (2008) (summarizing water markets in the Western U.S. from 1987 to 2005).

107. COLO. WATER CONSERVATION BD., ALTERNATIVE AGRICULTURAL WATER TRANSFER METHODS GRANT PROGRAM SUMMARY AND STATUS UPDATE 1-2 (2012).

108. Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 347 (1967).

109. *See* MacDonnell, *supra* note 9, at 2, 5; Smith, *supra* note 9, at 466-68.

110. COLO. CONST. art XVI, § 5.

111. *See* Navajo Dev. Co. v. Sanderson, 655 P.2d 1374, 1377 (Colo. 1982).

112. *See* COLO. REV. STAT. § 37-92-103(2), (3)(a) (2013).

113. *See* Smith, *supra* note 9, at 468-70.

114. *See, e.g.*, Colo. River Water Conservation Dist. v. Vidler Tunnel Water Co., 594 P.2d 566, 568 (Colo. 1979).

115. CF&I Steel Corp. v. Purgatoire River Water Conservancy Dist., 515 P.2d 456, 457-58 (Colo. 1973) (nonuse in conjunction with intent to abandon result in the loss of a water right).

place, for a particular purpose, and in priority.[116] Once applied, the water right owner has no right to claim unappropriated return flows; once applied, that water belongs to another appropriator.[117]

But the ultimate measure of an owner's private right in water - historical consumptive use ("HCU") - is generally not fixed until the owner seeks to transfer the right to a different use.[118] Along with a water right's priority, quantification of HCU is the primary stick in the bundle that defines the value of the right for transfer because HCU is the true quantitative measure of a water right.[119]

Consistent with the requirement that a change in use of a water right cause no injury to junior appropriators, HCU is the quantity of water an owner historically withdrew and consumed by application of the water to a decreed beneficial use[120] and, therefore, is water that was historically unavailable to supply other appropriators. As described in the next section, quantification of HCU is neither simple nor inexpensive, particularly when the right an owner seeks to change was historically used in irrigation.[121]

B. TRANSACTIONS COSTS

For water transfers, transaction costs are those costs associated with identifying opportunities for trade, negotiating transfers, monitoring, and potential mitigation of third party effects and conveyance.[122] The transaction costs incurred in obtaining legal approval to effect the proposed change in water right are of particular importance.[123] As discussed above, quantification of HCU takes on great significance in a change in use application.

A lack of accurate data can impede determination of HCU for changes of use involving agricultural water rights.[124] Determination of HCU requires assemblage of historic diversion records, which are generally available from the state.[125] The courts also require historical data regarding the types of crops grown and the number of acres irrigated.[126] In addition, HCU determination requires techniques like the Blaney-Criddle method, which incorporate data regarding tem-

116. *E.g., Navajo Dev. Co.*, 655 P.2d at 1377; George A. Gould, *Water Rights Transfers and Third-Party Effects*, 23 WYO. LAND & WATER L. REV. 1, 24-25 (1988) [hereinafter Gould I].

117. Comstock v. Ramsay, 133 P. 1107, 1111 (Colo. 1913) (It is a well-recognized principle of Colorado water law, that under our priority system, waters remaining after the application to a beneficial use "belong once again to the river system at the moment they are released by the user . . . and start to flow back to the river.").

118. *See* Smith, *supra* note 9, at 469-70.

119. *See* Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46, 54-55 (Colo. 1999).

120. *Id.*

121. James N. Corbridge, Jr., *Historical Water Use and the Protection of Vested Rights: A Challenge for Colorado Water Law*, 69 U. COLO. L. REV. 503, 524-26 (1998).

122. Laura McCann & K. William Easter, *A Framework for Estimating the Transaction Costs of Alternative Mechanisms for Water Exchange and Allocation*, 40 WATER RES. RESEARCH 1, 2 (2004).

123. Colby, *supra* note 12, at 1184.

124. *See* Gould I, *supra* note 116, at 20.

125. Corbridge, *supra* note 117, at 524.

126. George A. Gould, *Transfer of Water Rights*, 29 NAT. RES. J. 457, 464 (1989) [hereinafter Gould II].

perature, sunshine, climatological data, and consumptive use coefficients to estimate crop consumption, evapotranspiration, and evaporation.[127] Water courts must also determine ditch loss, as water lost through seepage in the ditch is not consumed and instead finds it way back to the tributary surface system.[128] The costs associated with such quantification can affect market activity.[129] This may even limit market efficiency or prevent market formation altogether.[130] Research suggests such costs push M&I water market participants away from the acquisition of previously-decreed native water and towards the market for foreign water delivered through existing projects.[131]

In contrast, consider the market for units of Colorado-Big Thompson Project ("C-BT") water, which the Northern Colorado Water Conservancy District ("NCWCD") oversees. Several unique qualities of C-BT units attract M&I providers. First, although use of the water may only occur within NCWCD boundaries, units may be transferred among users without the need for a return flow analysis.[132] Further, C-BT unit transfers are generally not subject to water court scrutiny, thereby considerably reducing the transactions costs associated with transferring units.[133] Lastly, C-BT units are homogenous as each share gets the same amount of water.[134]

By several accounts, the market for C-BT units is one of the better functioning water markets in the Western U.S.[135] By number of transactions, it is one of the most active water markets.[136] The relative ease with which water is transferred fosters continual trading, as opposed to markets for native water in which M&I providers tend to "buy ahead."[137] Because the development of new supplies is one of the four legs of the stool to address the M&I gap,[138] we could possibly see markets similar to the C-BT market arise with the completion of new supply projects. But such projects are expensive and take considerable

127. Gould I, *supra* note 116, at 20.

128. *See* Gould II, *supra* note 126, at 465.

129. Gould I, *supra* note 116, at 23.

130. Colby, *supra* note 12, at 1184.

131. NICHOLS ET AL., *supra* note 14, at 146-47. Native water is to be distinguished from foreign or "developed water." *Id.* Developed water "is that water which has been added to the supply of a natural stream and which never would have come into the stream had it not been for the efforts of the party producing it . . . It follows that the developers without hindrance could use, re-use, make successive use of and dispose of the water." City of Denver *ex rel.* Bd. of Water Comm'rs v. Fulton Irrigating Ditch Co., 506 P.2d 144, 147 (Colo. 1972); *see also* COLO. REV. STAT. § 37-82-106 (2013).

132. *See* Estes Park v. N. Colo. Water Conservancy Dist., 677 P.2d 320, 324 (Colo. 1984) (discussing Article 19 of the contract between NCWCD and the U.S. in which the latter reserved for the benefit of the former all return flows for domestic, irrigation, and industrial uses).

133. Howe & Goemans, *supra* note 15, at 1056.

134. *Id.*

135. David S. Brookshire, Bonnie Colby, Mary Ewers, & Philip T. Ganderton, *Market Prices for Water in the Semiarid West of the United States*, 40 WATER RES. RESEARCH 1, 7 (2004) ("[T]he CBT system of shares provide the simplest property rights structure to support market trades. The homogeneity of the right is the key characteristic that separates the water right from location, owner type, and historical use.").

136. Brown, *supra* note 6, at 3.

137. Howe & Goemans, *supra* note 15, at 1060.

138. SWSI 2010, *supra* note 3, at 7-4.

time to plan, construct, and permit.[139] In the meantime, we could proactively take the lessons learned from the C-BT market and translate them to improve the market for native water.

Shares in mutual ditch companies are capable of replicating some of these attributes, particularly when using a ditch-wide quantification approach. Determining the HCU attributable to each share in one proceeding results in homogeneity of shares, one of the qualities that economists have concluded improves the functionality of the C-BT market. Additionally, and as the C-BT market shows, a ditch-wide quantification would reduce future transaction costs and create incentives for trade.

C. INCENTIVES FOR WATER TRANSFERS AFTER *JONES DITCH* AND *BURLINGTON DITCH*

If part of Colorado's water portfolio to meet future water demand requires reliance on ATMs to prevent large scale dry up of agricultural land, then it is fair to evaluate the incentives for would-be ATM participants to engage in water markets. An analysis of the *Burlington Ditch* and *Jones Ditch* decisions reveals, at best, mixed incentives for the development of temporary transfers.

As alluded to above, these decisions encourage the development of water markets by recognizing the efficiency gains of ditch-wide quantifications. Ideally, the result of such an approach is twofold: (I) the homogenization of shares in a given ditch company, which allows each share to represent a right to use a certain amount of water under the same priority, and (II) reductions in the transaction costs associated with quantifying HCU. The two go hand-in-hand. It is easier to imagine the potential for water trades when the buyer and seller are certain as to the amount of water being traded before seeking water court approval. If the market for C-BT units is a comparison, then both of these results are important with respect to their potential to create incentives for water trading.

Though the Colorado Supreme Court expressed a preference for the ditch-wide approach, the outcome of both the *Burlington Ditch* and *Jones Ditch* cases established incentives to avoid such an approach. Both decisions point towards one conclusion: after more than a century of precedent and statutory development, property rights to water are still poorly defined in Colorado. No market, for water or otherwise, can be expected to form without well-defined property rights.[140] Our state goes to great lengths to define the nature of water rights, but does so only indirectly - by parameters that define its use.[141] If water markets are to function, the bundle of sticks comprising a water right must include how much of that right is transferrable. Ideally, this component would attach to a

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139. *See id.* at 7-21 (discussing factors to consider for new supply development strategy concepts); *see also* Gould II, *supra* note 126, at 457-58 (noting the financial implications of new water development projects).

140. *E.g.*, Terry L. Anderson & P.J. Hill, *The Evolution of Property Rights: A Study of the American West*, 18 J.L. & ECON. 163, 178 (1975) (noting that well-defined property rights led to greater enforceability); Gould I, *supra* note 116, at 24 ("Well-defined rights are one of the essentials for an efficient market.").

141. *See* Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645 (Colo. 2011); *In re* Water Rights of Cent. Colo. Water Conservancy Dist., 147 P.3d 9 (Colo. 2006).

water right prior to a change in use proceeding.

The Court's attempts to define the consumptive use of a water right in *Burlington Ditch* and *Jones Ditch* muddied the waters further. In *Jones Ditch*, the Court founded its determination of consumptive use on analysis of the original appropriator's intent. In that case, the 120-year old testimony of William R. Jones was controlling as to the quantification of HCU.[142] Similarly, the Court's decision to nearly halve Burlington's 1885 Direct Flow Right turned on the applicants' inability to demonstrate Burlington's intent over a century ago to irrigate lands below Barr Lake.[143] Now, when transferring an agricultural water right, the proponent must not only demonstrate compliance with all of the other parameters used to describe a water right - nonspeculative, continuous use, from an approved point of diversion, applied to the decreed type(s) of use, etc. - the proponent must also provide evidence that the amount to be transferred was applied to lands the original appropriator intended to irrigate. Surely, these decisions sent the boards of directors of ditch companies and the attorneys that represent them scouring historical files to determine if they could meet such a burden. *Burlington Ditch* and *Jones Ditch* did more to increase uncertainty with respect to water rights, thus chilling the development of water trading.

D. THE "LEGACY DITCH BILL"

Recent legislation introduces certainty into senior agricultural water rights. The Legacy Ditch Bill provides that the lawful maximum amount of irrigated acreage for decrees entered prior to 1937, and which are silent as to the number of acres the appropriator may irrigate, is the maximum amount of acreage irrigated (in compliance with all other provisions of the decree) during the first fifty years after entry of the decree.[144] This statute's operation is akin to statutes of limitation. It creates a presumption that even allegedly unlawful right expansions through historical diversions that have gone unchallenged by the State Engineer or other water users are indeed lawful.

Similar legislation has protected other rights, notably those in property. Colorado recognizes an 18-year limitation on real property claims.[145] This and other statutes of limitation strike a balance between affording an opportunity for redress and the need to protect against the risk of error about the merits of stale claims when evidence may be difficult to obtain because it has been lost, memories have faded, or witnesses have disappeared or are deceased.[146] In sum, statutes of limitation offer certainty. In a commercial setting, such certainty fosters investment and market activity.[147] This is the essence of the Legacy Ditch Bill - to offer sufficient time for contesting assertions of unlawful enlargement, while simultaneously protecting longstanding uses of water from ancient claims. Such certainty alleviates the surprise water rights owners (or prospective purchasers) experience when their rights are suddenly rendered valueless.

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142. *Cent. Colo. Water Conservatory Dist.*, 147 P.3d at 17.

143. *Burlington Ditch*, 256 P.3d at 664.

144. COLO. REV. STAT. § 37-92-305(4)(a)(I)(B) (2013).

145. *Id.* at § 38-41-101(1).

146. Order of R.R. Telegraphers v. Ry. Express Agency, 321 U.S. 342, 348-49 (1944).

147. Tyler T. Ochoa & Andrew J. Wistrich, *The Puzzling Purposes of Statutes of Limitation*, 28 PAC. L.J. 453, 467 (1997).

The Legacy Ditch Bill is a step towards defining that all-important stick in the bundle for agricultural water - HCU. Knowing that certain senior agriculture water rights have some protection from claims of unlawful expansion, like those at issue in *Burlington Ditch* and *Jones Ditch*, restores value to those rights and lets market participants confidently enter into transactions for those rights.

III. RECOMMENDATIONS

The Supreme Court has identified ditch-wide quantifications as the most efficient and viable means to quantify senior irrigation rights to permit additional uses.[148] However, unanswered questions remain. This section discusses three commonly expressed questions regarding ditch-wide quantification in the wake of *Jones Ditch*, *Burlington Ditch*, and the adoption of the Legacy Ditch Bill, and provides preliminary responses to these concerns.

A. WILL QUANTIFICATION ACCELERATE BUY AND DRY?

If the goal of ditch-wide quantifications is to facilitate future transfers of water, a reasonable argument exists that such a method will only accelerate buy and dry. That is, it is good to have barriers to protect existing agricultural water because M&I providers acquiring agricultural rights ought to bear the burden of proving HCU of the water rights they acquire. Otherwise, it would become much easier for water to leave agriculture. This is a valid concern.

Ditch-wide quantifications are not a panacea to solve all allocation problems and, acting alone, they cannot be expected to overcome the underlying reasons for widespread buy and dry. But, further analysis provides hope that ditch-wide quantifications are a step in the right direction. Colorado's current system for water transfers appears to promote, or at least contribute to, buy and dry. Due to economies of scale, M&I suppliers acquiring water tend to "buy ahead."[149] Under current conditions, this is a rational position. M&I suppliers need to secure enough water to justify the expense as transaction costs increase. If a transaction yields more water than a municipality needs in the short term, the municipality is protected because it can always lease water back to the ditch company.

Ditch-wide quantifications can offer a way to reduce the buying-ahead phenomenon. If the costs associated with acquiring ditch shares can be lowered because the transferrable amount (i.e., the HCU) of the shares has already been determined, M&I suppliers can better align their water acquisitions with their near-term anticipated demand. Again, turning to the market for C-BT units for a reference, there is evidence that transfers of CB-T units are much smaller than traditional water rights transfers.[150] Low transaction costs allow continual trading rather than the occasional large transfer.[151]

The next logical question is: Won't this lead to a death by a thousand paper cuts? Is the result the same - water leaving agriculture bound for urban use? Are we just delaying the inevitable? This is an area where the CWCB's ATM

148. *See* Cent. Colo. Water Conservatory Dist. v. City of Greely, 147 P.3d 9, 19 (Colo. 2006).
149. Howe & Goemans, *supra* note 15, at 1059-60.
150. *Id.*
151. *Id.*

grant program can prove helpful by devising long-term options for water markets. Successful water markets need the flexibility to allow M&I users and irrigators to share water under the same right. Such proposals could restore balance in water allocation by giving agricultural users a viable alternative to selling their entire water right. Middle ground does exist. But, our current approach has failed at finding it. Whether through extended-period water leases, water banks, rotational fallowing, or other ATM concepts, the road to greater water sharing, and thus more water remaining in agriculture, must lead through quantification. Accomplishing quantification on a wider scale through the ditch-wide method opens the door for more participants in ATM-type programs.

B. WHAT ARE THE EFFECTS TO NON-CHANGING SHAREHOLDERS?

Colorado has long recognized the right to change the use of an established water right as a fundamental stick in the bundle of rights that make up a valuable usufractuary right, subject to the condition that such a change may not injure other appropriators.[152] Similarly, this general rule has long applied to shareholders in a mutual ditch company.[153] As owners of a portion of the underlying senior water right decreed for irrigation, shareholders enjoy the right to change the use of their shares.[154] When they do so, however, the mutual ditch company - a non-profit entity charged with delivering each shareholder its pro rata portion of the water right[155] - is faced with challenges arising out of the novel characteristics of the changed portion of the right. Suppose a water court imposes special terms and conditions upon the exercise of the right for the new use that may impact shareholders other than the shareholder seeking the new use. This imposition and extension of terms to non-changing shareholders creates questions regarding the ability of the changing shareholder to initiate a process that could affect others in the ditch. Assuming such a proceeding is lawful, the extent of notice and participation by the mutual ditch company and/or other shareholders is also questionable. The contractual nature of the mutual ditch company and its resultant ability to impose reasonable restrictions on the diversion and use of the senior water right create another layer of potential complication. Colorado's water community must adequately address these questions if the ditch-wide quantification approach is to be adopted on a broad scale.

i. Notice: How Much is Required?

If a shareholder or group of shareholders is going to request a change in place or type of use that could have effects upon non-changing shareholders and the operation of the mutual ditch company as a whole, it is imperative that the ditch company and the non-changing shareholders receive full and fair notice and opportunity to participate in the water court process. Colorado has existing laws and procedures to address this concern as it relates to individual

152. *E.g.*, Strickler v. City of Colo. Springs, 26 P. 313, 316 (Colo. 1891).
153. *E.g.*, Wadsworth Ditch Co. v. Brown, 88 P. 1060, 1061 (Colo. 1907).
154. Fort Lyon Canal Co. v. Catlin Canal Co., 642 P.2d 501, 509 (Colo. 1982).
155. *Id.* at 508.

shareholders - monthly resume publication in each water division.[156] The purpose of the resume notice is to alert all other water users to an application that could affect their rights.[157] In *Burlington Ditch*, the Court addressed challenges to the Water Court's jurisdiction by analyzing the sufficiency of the resume notice.[158] Thus, the Court has adopted and recently used this approach.

If their bylaws permit, ditch companies have the right to approve a change in use application prior to shareholder filing and to insist upon terms and conditions that protect the company and the non-changing shareholders.[159] If the ditch company's board properly exercises this power, it may eliminate the need for both the ditch company and individual shareholders to appear in the water court to protect their rights.

In the change of use context, determination of HCU by a ditch-wide approach will, by definition, affect other shareholders in the system. Courts will analyze questions regarding diversion patterns, ditch loss, administration, and others and reflect such issues in a decree. As discussed below, the outcomes of these prior decisions may bind other shareholders in subsequent cases. For any water court application, the resume notice must contain the name and address of the applicant, a description of the water right involved, and a description of the ruling sought.[160] If the applicant provides this information and publishes it in the resume such that other parties have at least inquiry notice - i.e., that level of notice sufficient to reveal to potential parties the nature of the claim being made so they can decide whether to conduct further inquiry into the full extent of those claims and whether to participate - the notice requirement is satisfied such that the Court has proper in rem jurisdiction to decide the case.[161]

ii. Can Non-changing Shareholders be Bound?

Another question that must be addressed is whether and to what extent a single shareholder, or subset of shareholders, in a mutual ditch company may unilaterally request a change in type or place of use that results in findings of fact or law that are binding upon non-changing shareholders. For ditch-wide quantifications to realize their anticipated benefit - primarily gains in efficiency - the answer to this question should be yes. As co-owners of a larger water right, it is not unreasonable to expect that shareholders in a ditch company may, from time to time, initiate actions that bind other shareholders. This expectation is incident to co-ownership. Determination of HCU in an earlier proceeding should be preclusive on that issue in subsequent cases, absent changed circumstances.

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156. *See* COLO. REV. STAT. §§ 37-92-302(3)(a)-(b) (2012).

157. City of Thornton v. Bijou Irrigation Co., 926 P.2d 1, 24-25 (Colo. 1996); Monaghan Farms, Inc. v. City & Cnty. of Denver, 807 P.2d 9, 17 (Colo. 1991).

158. Burlington Ditch Reservoir & Land Co. v. Metro Wastewater Reclamation Dist., 256 P.3d 645, 675-76 (Colo. 2011) ("The resume in both cases was sufficient to place parties on notice: they contained detailed information on the water rights at issue, the location of the structures, to which those rights were decreed, and the scope and impact of the decree sought.").

159. *Fort Lyon Canal Co.*, 642 P.2d at 506-07.

160. COLO. REV. STAT. § 37-92-302(3)(a) (2012); *see also Bijou Irrigation Co.*, 926 P.2d at 26 (inadequate resume notices are those "characterized by the complete absence of material information concerning the disputed water rights.").

161. *Burlington Ditch*, 256 P.3d at 674-75, 677.

Shareholders in a ditch company are co-owners of the senior water right they allocate among themselves.[162] Such shareholders have chosen to enter this co-ownership relationship on a contractual basis with other shareholders. In other contexts, Colorado law recognizes the right of a co-owner to initiate a judicial proceeding that binds other co-owners. Consider the right of a co-owner in real property to initiate an action for partition.[163] In some respects, a ditch-wide quantification can be analogized to such a partition action. Similar to the rights of co-owners in real property, shareholders in a ditch company should reasonably expect that other shareholders will commence actions that have the potential to affect the non-changing shareholder's interest, particularly where shareholders submit change in use applications requiring quantification of the water right sought to be changed.

The Colorado Supreme Court has consistently approved of the principle that a prior determination of HCU should have preclusive effect in a later action.[164] The proper application of issue preclusion can reduce transaction costs in subsequent determinations because application of the doctrine saves the proponent in a later change in use case from having to put on evidence regarding HCU.[165] The application of issue preclusion is not without its limits. One such limit becomes apparent when circumstances have changed since the previous determination.[166] The Supreme Court has applied this exception to reopen previous decrees to determine injury resulting from enlarged use,[167] but the Court has not extensively tested the exception in change in use cases involving ditch-wide quantification. We suspect that future cases will refine the extent of this exception.

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162. Farmer's Reservoir & Irrigation Co. v. Consol. Mut. Water Co., 33 P.3d 799, 807 (Colo. 2001); Jacobucci v. Cnty. of Jefferson, 541 P.2d 667, 672 (Colo. 1975).

163. COLO. REV. STAT. § 38-28-101 (2013).

164. High Plains A & M, LLC v. Se. Colo. Water Conservancy Dist., 120 P.3d 710, 723 (Colo. 2005) ("Second, we have held that a sufficient ditch-wide historic consumptive use analysis in a change of water right case can be utilized in another change case for allocation of the amount of water to which the mutual company shareholder is entitled"); Williams v. Midway Ranches Prop. Owners Ass'n, Inc., 938 P.2d 515, 526 (Colo. 1997) ("However, when historical usage has been quantified for the ditch system by previous court determination, the yield per share which can be removed for use in an augmentation plan is not expected to differ from augmentation case to augmentation case . . . ."); *Farmers Reservoir & Irrigation Co.*, 33 P.3d at 807 ("Once the Water Court has adopted a methodology for determining an appropriation's historic beneficial consumptive use and has made allocations of consumptive use based thereon, that methodology and those allocations are normally expected to govern future change proceedings involving the same water right.").

165. *High Plains A & M*, 120 P.3d at 723 ("Appropriate implementation of claim and issue preclusion prevents expensive relitigation of historical consumptive use in transfer after transfer involving the same ditch or reservoir system"); *Midway Ranches*, 938 P.2d at 525 ("The water court may take judicial notice of its prior determinations and decrees in historic use, change, and augmentation plan cases involving the same water right. The creation of water divisions and the appointment of water judges on a watershed basis to make findings of fact and conclusions of law necessarily anticipates reliance on prior judgments and decrees as to noticed, adjudicated claims regarding a water right.").

166. Farmers High Line Canal v. City of Golden, 975 P.2d 189, 200-01 (Colo. 1999); *Midway Ranches*, 938 P.2d at 526.

167. *E.g.*, *Farmers High Line Canal*, 975 P.2d at 200-01.

iii. How Should Consumptive Use be Distributed among Shareholders?

Assuming a ditch-wide analysis quantifies the consumptive use by the entire senior irrigation right, how should shareholders divide that consumptive use? At first blush, the answer to this question seems obvious: ditch companies should distribute consumptive use and diversions pro rata. However, the details of HCU analyses and the vagaries of mutual ditch company administration cloud this seemingly straightforward approach.

Some preliminary examples aid the analysis. In simple terms, consider two ditch systems - one "water short" and one "water long." In the water short ditch system, average crop demand consistently exceeds average available water supply under the senior water right. In such a system, shareholders suffer shortages and are more likely to demand their full pro rata portion of the senior right. Under these conditions, administration is often supervised; shareholder headgates may have measuring devices, shareholders are required to call for or place orders for water, and the ditch rider or ditch superintendent plays an active role in ensuring that each shareholder receives their pro rata portion.

In contrast, in the water long ditch, average available supplies diverted under the senior irrigation right exceed average crop demand under the ditch. Plenty of water is available and shareholders are unlikely to consistently demand a full pro rata portion of the senior right. Instead, they will deliver the amount necessary to meet the demands of the crops, which often constitutes an amount less than the pro rata entitlement. For obvious reasons, administration within the water long ditch is likely to be less stringent; farm headgates may not have measuring devices, shareholders are permitted to open and close their headgates at will rather than relying upon the ditch superintendent.

In reality, ditch administration is more complicated than the simple water short and water long examples imply. Three factors increase the level of complexity. First, few ditches are water short or water long all the time. Ditches may be water long in the spring when the runoff is occurring, water short in midsummer when the ditch is subject to a senior call, and water long again in the fall. So, the question of whether a ditch is water long or water short must itself be answered with a temporal question- when?

Second, few ditches deliver water to all shareholders all the time. Even in predominately water short systems, farming practices may dictate delivery to only a portion of the shareholders at a given time. Crops, cultivation, and irrigation methods can all vary under a ditch. For example, a farmer using a center pivot irrigation system may demand water only when the system is running, a farmer cutting hay will not deliver water to the field, while depending upon its size and soil type or precipitation events, a furrow-irrigated corn field may be saturated and in need of several days without water. As a result of factors like these, less than all headgates are likely to be taking water at a given time. When some headgates are closed, the remaining open headgates will divide available water between them and each will receive more than its pro rata entitlement for that day. In this sense, many ditch companies may be truly "mutual" in the sense that the shareholders use one another's pro rata portions on a given day. Ideally, as the irrigators take turns using one another's water, deliveries approach a pro rata amount over the course of an irrigation season.

The third complexity arises out of the size and water demand of individual

farms within a system. Regardless of whether a ditch system is water short or water long as a whole, individual farms within the system may be water short or water long depending upon the number of shares used to irrigate each farm. Within a given ditch system, farmers own a specific number of shares entitling them to an identified portion of the diversions of the senior right.[168] For example, in a ditch company with 100 shares and a 100 cfs water right, each share would be entitled to one cfs, less ditch loss, expressed as a flow rate, or 1/100th of diversions over the course of the irrigation season, expressed as a volume. A shareholder owning five shares would be entitled to five cfs, or 5/100th of the diversions in acre-feet. Now assume the lands irrigated by this ditch consist of a patchwork of individually owned parcels of varying sizes. In general terms, shareholders will have a sense for how much acreage a single share will irrigate. In the present example, it could be that one share, which entitles a shareholder to one cfs, will irrigate eighty acres so that a shareholder owning eighty acres and one share could be expected to produce a crop.

In an ideal world, each irrigator would own precisely the number of shares necessary to irrigate lands that he or she owns. In reality, this is not the case. Shares are bought and sold between shareholders, parcels are divided and sold. As a result, farms end up with an unequal number of shares per acre. For example, it is possible that a 240-acre farm may have one share associated with it, while the neighboring eighty-acre farm has three shares. Using the present example, this would mean that the 240-acre farm would be dramatically water short, while the eighty-acre farm would be dramatically water long, regardless of whether the ditch system itself was considered water short or water long. In actual operation, it is unlikely that the eighty-acre farm received a full pro rata amount, literally flooding the crops, while the neighboring 240-acre farm received less than the amount necessary to grow a crop. Instead, the eighty-acre farm took what it needed, which was less than the pro-rata amount attributable to three shares, and the 240-acre farm picked up the excess from the eighty-acre farm and used more than its pro-rata amount.

To illustrate the issues these variables raise in the context of a ditch-wide change in use application, assume that on a system-wide basis the consumptive use associated with each share is fifty acre-feet. The simplest ditch-wide analysis assumes that each shareholder received a pro rata delivery of water, eliminating variability like that described above between the eighty- and 240- acre farms. Historically, the 240-acre farm consumed 150 acre-feet per year, while the eighty-acre farm consumed fifty acre-feet per year. The question arises as to who is entitled to the benefit of the consumptive use that occurred by the delivery of the eighty-acre farm's shares to the 240-acre farm? Using share ownership, the eighty-acre farm owner, as owner of three shares, should be entitled to 150 acre-feet, while the 240-acre farm owner would be entitled to fifty acre-feet. At the same time, the three-share owner, as the owner of that specified portion of the senior water right, did not use it. Instead, it was the one-share owner that invested the time and effort necessary to secure the consumptive use. How should the mutual ditch company address this issue? How would the law address it if the mutual ditch company does not provide guidance?

168. Jacobucci v. Cnty. of Jefferson, 541 P.2d 667, 672 (Colo. 1975).

As an additional layer, consider the frequent water court term and condition requiring the party changing the use of a senior irrigation right to dry up or cease irrigating the acreage historically irrigated by the right.[169] Can the three-share, eighty-acre owner force the 240-acre owner to cease irrigating? If the system is voluntary, and allows the 240-acre owner to "sell" dry up acreage, is it fair that the three-share owner should theoretically have the benefit of 150 acre-feet, but lose the value as a practical matter out of the necessity to pay the 240-acre owner for dry up acreage? The latter result could strike many mutual ditch company shareholders as unfair because it essentially punishes those within the ditch system that had the foresight to acquire sufficient shares to irrigate and rewards those who farmed 'on the cheap' by relying upon others' excesses.

Mutual ditch companies should be prepared for these questions to arise in the context of a ditch- wide analysis and be ready to develop bylaws or policies that fairly distribute the consumptive use attributable to each share. The answers to these questions will vary with each ditch company, depending upon the facts and circumstances. The important thing is that companies recognize the questions, and move proactively to address them.

C. WHAT IS THE ROLE FOR CATLIN BYLAWS AND INTERNAL REGULATION?

Mutual ditch companies' ability to impose reasonable regulations upon the exercise of shareholders' pro rata portion of the water right presents the best avenue for companies to address the questions raised in this section and thrive in a new era of ditch-wide quantification. Colorado ditch companies occupy a unique corner of the law. Though some similarities exist between ownership of shares in a ditch company and shares in a general corporation, the analogy breaks down because of the distinctive nature of ditch companies.[170] It is not a trust relationship.[171] The relationship is one formed in contract.[172] Nonetheless, the ditch company, formed largely out of the necessity to share in the monumental task of constructing ditches in Colorado's early history, still remains a "vehicle by which its owners operate and manage its affairs."[173]

In the context of a change in use proceeding, shareholders have the same right as other appropriators to change the place of use, subject to the no-injury standard.[174] In the context of such a change, ditch companies are not merely bystanders; they have the authority to impose reasonable limitations, beyond those contained in the 1969 Act, upon a shareholder seeking to obtain a change in their water right.[175] "Catlin Bylaws," named after the Colorado Supreme Court case that approved them[176], are the proper venue for resolving questions surrounding the appropriateness of a ditch-wide quantification for a particular company.

169. City of Thornton v. Bijou Irr. Co., 926 P2.d 1, 87 (Colo. 1996).
170. Jacobucci v. Cnty. of Jefferson, 541 P.2d 667, 672 (Colo. 1975).
171. *Id.* at 673.
172. *Id.* at 672 (citing Supply Ditch Co. v. Elliott, 15 P. 691 (Colo. 1887)).
173. *Id.* (quoting Billings Ditch Co. v. Indus. Comm'n, 253 P.2d 1058, 1060 (Colo. 1953)).
174. *E.g.*, Fort Lyon Canal Co. v. Catlin Canal Co., 642 P.2d 501, 509 (Colo. 1982).
175. *Id.* at 508-09.
176. *Id.*

The Court approved the most basic form of a Catlin Bylaw in *Fort Lyon Canal Co. v. Catlin Canal Co.*, which requires shareholders to receive company approval prior to filing a water court or administrative change in use application.[177] These bylaws may require the shareholder to present a complete application, including supporting engineering and a proposed water court application, to the ditch company board of directors for review prior to filing. The bylaw may also require the shareholder requesting the change in use to make a deposit to the company to offset the legal and engineering costs of review. Review of the application gives the mutual ditch company board the opportunity to consider the potential impact of the application upon non-changing shareholders and the company. A mutual ditch company may condition approval on compliance with terms and conditions reasonably necessary to protect other shareholders and the company from injury. Mutual ditch company boards should be careful to strike a balance between the tension between the individual shareholder's right to change the use of his or her portion of the right and the rights of non-changing shareholders to continue irrigation practices. The Catlin Bylaw power is not without limitation and should be exercised judiciously to preserve its potency.

Since the relationship between shareholders in a mutual ditch company is grounded in contract, it is possible that the bylaws could address many other issues. For example, regardless of how the General Assembly or water court handles the notice issue, the bylaws could require a shareholder seeking to implement a ditch-wide change in use to personally notify all other shareholders. Likewise, a bylaw could address issues of how to allocate consumptive use and how to distribute dry-up. Companies with foresight could agree beforehand how to process a ditch-wide application, from its inception to prosecution, on fundamental terms and conditions, and to create a cost-sharing mechanism within the ditch for those that benefit from its provisions. The Catlin Bylaw power mutual ditch companies enjoy allows those closest to the right - its owners - to establish reasonable parameters for a ditch-wide quantification.

CONCLUSION

Large-scale quantification of senior irrigation rights is a prerequisite to the development of effective and efficient water markets in Colorado. Assigning consumptive use amounts and standardized terms and conditions for new uses of the changed rights, in addition to the historical irrigation usage, opens the door to new modes of agricultural-urban water sharing. It has the potential to reduce the pressure for M&I users to buy and dry Colorado's farms. The Colorado Supreme Court has identified ditch-wide quantifications as the most efficient means of achieving quantification. The current legal and regulatory environment can provide notice and adjudicate ditch-wide quantification and produce equitable results. Mutual irrigation companies should move proactively to address key questions and develop ditch-specific policies to guide quantification.

177. *Id.*

THE ROLE OF TEMPORARY CHANGES OF WATER RIGHTS IN COLORADO

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I. INTRODUCTION

"Buy and dry" has become a rallying cry in Colorado.[1] For those not familiar with the phrase (usually a pejorative), it references the sale and severance of water rights originally decreed for irrigation from previously irrigated lands, and the subsequent use of that water for other purposes not upon that land.[2] Many of the communities and farms that malign "buy and dry" practices do so out of the impression that cities are out to "take" their water.[3] Certain voices in these rural communities point to a long list of perceived negative effects they associate with changes in land use, including reductions in the total number of acres irrigated,[4] reductions in population in nearby communities,[5] and potential economic effects resulting from reductions in irrigated acres.[6] Despite perceived community downsides, individual agricultural water rights holders continue to voluntarily sell their water rights to municipal water users.[7]

But, "buy and dry" is only a small part of the story. For cities and other municipal water suppliers, the issue is not about trying to "take" water away from agricultural water users, but instead about trying to meet the expanding water demand of a growing population.[8] Recent studies indicate that Colorado's population will likely grow by nearly eighty percent by 2050.[9] Statewide, municipal, and industrial water suppliers face an expected water deficit of 633,000 acre-feet based upon such population growth.[10]

To put this 633,000 acre-feet deficit into perspective, the historical average annual stream flows leaving the state of Colorado from the South Platte River Basin and the Arkansas River Basin –the basins in which almost eighty-eight percent of Colorado's population reside[11] – is about 702,000 acre-feet a year.[12]

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1. *See* Matt Jenkins, *A Colorado Newspaperman Fights for His Valley's Water*, HIGH COUNTRY NEWS, Mar. 19, 2012, http://www.hcn.org/issues/44.5/a-colorado-newspaperman-fights-for-his-valleys-water.

2. *See* Megan Verlee, *Thirsty Cities, Dry Farms: Part 1 - Buy and Dry*, COLO. PUB. RADIO, July 27, 2011, http://www.cpr.org/article/Thirsty_Cities_Dry_Farms_pt_1__Buy_and_Dry; *see also* Jennifer Thorvaldson & James Pritchett, *Economic Impact Analysis of Reduced Irrigated Acreage in Four River Basins in Colorado*, 207 COLO. WATER RES. RESEARCH INST. 5 (2006).

3. Jenkins, *supra* note 1; *see also* Thorvaldson, *supra* note 2, at 5.

4. Bruce Finley, *Colorado Farmland Goes Dry as Suburbs Secure Water Supplies*, THE DENVER POST, Mar. 13, 2011, http://www.denverpost.com/recommended/ci_17598524.

5. James Pritchett, et al., *Water Leasing: Opportunities and Challenges for Colorado's South Platte Basin*, 2008 W. AGRIC. ECON. ASSOC. 3-4, *available at* http://agecon-search.umn.edu/bitstream/37725/2/Thorvaldson_WAEA_2008_Paper.pdf.

6. Thorvaldson, *supra* note 2, at 7.

7. Finley, *supra* note 4.

8. *See* Cathy Proctor, *Steady Water Supply Oils the Gears of Business*, DENVER BUS. J., Sept. 7, 2012, http://www.bizjournals.com/denver/print-edition/2012/09/07/steady-water-supply-oils-the-gears-of.html.

9. COLO. WATER CONSERVATION BD., STATEWIDE WATER SUPPLY INITIATIVE 2010, APPENDIX H–STATE OF COLORADO 2050 MUNICIPAL & INDUSTRIAL WATER USE PROJECTIONS 2-11 (2010), *available at* http://cwcb.state.co.us/water-management/water-supply-planning/Documents/SWSI2010/Appendix%20H_State%20of%20Colorado%202050%20Municipal%20and%20Industrial%20Water%20Use%20Projections.pdf.

10. COLO. WATER CONSERVATION BD., ALTERNATIVE AGRICULTURAL WATER GRANT PROGRAM SUMMARY 1 (2011), *available at* http://cwcbweblink.state.co.us/weblink/0/doc/150555/Electronic.aspx?searchid=9918b278-0e2f-4c0e-acff-280192b81b95.

11. COLO. WATER CONSERVATION BD., *supra* note 9, at 2-11 tbl.2-2.

12. HYDROGRAPHIC BRANCH, COLO. DIV. OF WATER RES., COLORADO HISTORICAL

Put another way, the projected municipal and industrial deficits alone would consume ninety percent of the water naturally produced in those basins, which has heretofore flowed downstream to neighboring states. Such a comparison illustrates the magnitude of the water deficit problem facing Colorado.

In short, projected water needs will exceed the physical supply of water in these basins. Indeed, between Colorado's existing water uses and its compact commitments to downstream states, there is little unappropriated water supply available in Colorado.[13] Therefore, the practical reality facing many municipal water suppliers is that transfers of existing water supply to new uses is the mechanism available to meet growing demands.

Thus, "buy and dry" is only half the story. The full story is that Colorado anticipates a growing water demand, which necessitates the continued transfer of existing water rights to new uses. Considering Colorado agriculture accounts for eighty-six percent of the state's consumptive water use,[14] the overwhelming likelihood is that Colorado's agricultural water supply will be a source of supply to municipalities in some form.

Outright purchase is the simplest method for effectuating these transfers. Colorado law has long recognized the ability of water right owners to sell, sever, and change their water rights as an exerciseable privilege and an important stick in the bundle of rights constituting a Colorado water right.[15] Under this legal regime, it is fanciful to believe that willing sellers and willing buyers will not do business, particularly where the demand for water is great. However, that is not to say that "buy and dry" is the only solution – or even the best solution.

Recently, the Colorado Water Conservation Board ("CWCB"), under the auspices of the 2010 Statewide Water Supply Initiative ("SWSI"), published a final report that outlines several alternative agricultural water transfer methods.[16] The report identified several reasons why there has not been significant development of alternative agricultural water transfer methods in Colorado, including:

- Lack of financial incentive to seek an alternative to permanent water transfers
- Expensive transaction costs to obtain water court approval, which is required for any permanent alternative water transfer
- Lack of a viable administrative process for approving alternative water transfers
- Uncertainty regarding accounting and administration of alternative water transfers
- Verification that a given water right has not expanded under the auspices

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AVERAGE ANNUAL STREAM FLOWS (2011), http://water.state.co.us/DWRIPub/DWR%20Maps/2011SnakeDiagram.pdf.

13. *See* COLO. WATER CONSERVATION BD., STATEWIDE WATER SUPPLY INITIATIVE 2010 6-3 (2011), *available at* http://cwcb.state.co.us/water-management/water-supply-planning/Documents/SWSI2010/SWSI2010.pdf.

14. *Colorado's Water Needs*, COLORADO WATER CONSERVATION BD., http://cwcb.state.co.us/water-management/water-supply-planning/Pages/ColoradosWaterSupplyNeeds.aspx (last visited Feb. 1, 2014).

15. Williams v. Midway Prop. Owners Ass'n, 938 P.2d 515, 523 (Colo.1997); Pueblo W. Metro. Dist. v. Se. Colo. Water Conservancy Dist., 717 P.2d 955, 959 (Colo. 1986).

16. COLO. WATER CONSERVATION BD., *supra* note 13, at 7-18 tbl.7-6.

of an alternative water supply transfer and

- Desire for permanence and certainty of any alternative water supply transfer.[17]

These reasons are by no means an exclusive list of the problems facing alternative transfer methods. However, the list identifies an important impediment: a lack of the necessary legal framework to successfully implement alternative water transfers.

One of the alternative water transfer methods suggested in the SWSI is the Interruptible Water Supply Agreement ("IWSA").[18] An IWSA is a statutorily recognized agreement, which, if approved by the Colorado State Engineer's Office, allows for a temporary change of an absolute water right for a new use.[19] The statute does not require an adjudication of the agreement in the Colorado water courts, but only allows for the proposed changes to operate for three seasons during a ten-year period.[20]

Since the enactment of the IWSA statute in 2003,[21] no one has utilized it in any significant fashion.[22] Despite the failure of the IWSA statute to promote temporary water transfers over permanent water transfers, there is still a will, and a need, to make such temporary transfers a reliable mechanism for obtaining temporary water supplies. In 2007, the Colorado Assembly enacted Senate

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17. *Id.* at 7-19.

18. COLO. WATER CONSERVATION BD, *supra* note 10, at 4-5.

19. COLO. REV. STAT. § 37-92-309 (2014).

20. §§ 37-92-309 (1), (3) (c).

21. Act of Jun. 5, 2003, ch. 363, 2003 Colo. Sess. Laws (2003).

22. For example, the City of Aurora and the Rocky Ford area High Line Canal Company entered into a temporary lease that operated very much like an interruptible water supply agreement, but the SEO approved that agreement pursuant to different legislative authority. *See* Application Letter from Duncan, Ostrander & Dingess, P.C., on behalf of the City of Aurora, to Hall Simpson, P.E., State Engineer, Office of the State Eng'r, Colo. Div. of Water Res. (June 30, 2003) (on file with *Water Law Review*) [hereinafter "Aurora Application, Water Year 2004"]; Decision Letter from Office of State Eng'r to John M. Dingess, Duncan, Ostrander & Dingess, P.C. (Jan. 30, 2004) (on file with *Water Law Review*) [hereinafter "SEO Approval, Water Year 2004"]. Also, in 2012 East Cherry Creek Valley Water and Sanitation District, the Arapahoe County Water and Wastewater Authority, and the United Water and Sanitation District submitted two interruptible water supply agreement applications that the State Engineer's Office approved on December 24, 2012; however, the applicants subsequently requested to cancel the applications on February 8, 2013. *See* Request for Approval Letter from William B. Tourtillott et al., on behalf of Arapahoe Cnty. Water & Wastewater Auth. & United Water & Sanitation Dist., to Joanna Williams, Office of the State Eng'r (Apr. 16, 2012) (on file with *Water Law Review*); Request for Approval Letter from William B. Tourtillott et al., on behalf E. Cherry Creek Valley Water & Sanitation Dist. & United Water & Sanitation Dist., to Joanna Williams, Office of the State Eng'r (Apr. 16, 2012) (on file with *Water Law Review*); Approval Letter from Kevin G. Rein, P.E., Deputy State Eng'r, to Tod J. Smith, on behalf United Water & Sanitation Dist & Arapahoe Cnty. Water & Wastewater Auth. (Dec. 24, 2012) (on file with *Water Law Review*); Approval Letter from Kevin G. Rein, P.E., Deputy State Eng'r, to Tod J. Smith, on behalf United Water & Sanitation Dist. & E. Cherry Creek Valley Water & Sanitation Dist. (Dec. 24, 2012) (on file with *Water Law Review*);Request to Cancel Letter from Brian M. Nazarenus et al., to Kevin G. Rein, Office of the State Eng'r. (Feb. 8, 2013) (on file with *Water Law Review*). [hereinafter collectively "ACWWA, ECCV & United IWSA Applications."] Finally, various CWCB funded Alternative Agricultural Water Transfer Method Grant Programs proposed exploring interruptible water supply agreements. *See* COLO. WATER CONSERVATION BD., ALTERNATIVE AGRICULTURAL WATER TRANSFER METHODS GRANT PROGRAM SUMMARY 11-12 (2011), *available at* http://cwcbweblink.state.co.us/weblink/0/doc/150555/Electronic.aspx?searchid=9918b278-0e2f-4c0e-acff-280192b81b95.

Bill 07-122, which appropriated $1,500,000 for a grant program "to advance various agricultural transfer methods as alternatives to permanent agricultural dry-up in the South Platte and Arkansas river basins, including but not limited to, interruptible water supply agreements . . . ."[23] In 2009, the Colorado Assembly enacted Senate Bill 09-125, which appropriated an additional $1,500,000 for the grant program and removed language limiting the program to the Arkansas and South Platte River Basins.[24] A review of the grant recipient projects indicates that only one more potential IWSA project will is likely to occur in the near future, although at least two other grant recipient projects may use IWSAs as a mechanism for their proposed temporary changes.[25]

Based on these investments, the State of Colorado must consider it laudable to investigate and incentivize these alternative water transfers. But at present, the IWSA statute is one of the only alternative water transfer mechanisms available in Colorado.[26] Consequently, there is value in developing an IWSA statute desirable to Colorado water users because other alternative water transfer methods - such as rotational fallowing, purchase and lease-back, and water banking - are likely to operate similarly in form to an IWSA[27] and face common legal impediments to successful implementation. Accordingly, developing a workable legal framework for IWSAs may further other forms of temporary transfers in Colorado.

Having a variety of means to transfer water to new uses is important, because it adds flexibility to our administration of a dynamic water resource. Colorado should embrace the opportunity to implement additional transfer methods, recognizing that such methods could preserve Colorado water users' individual property rights while simultaneously addressing serious water supply deficits. In short, establishing alternative transfer mechanisms allows individual water users to make decisions about their own water rights. However, Colorado must be wary of expanding the property rights of one group of water users to the detriment of another. To that end, the legal frameworks Colorado establishes allowing alternative transfer mechanisms will be very important.

Because of the unique role IWSAs currently play, and the increasing interest in other alternative transfer mechanisms, this article seeks to: (I) review the

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23. Act of May 31, 2007, ch. 352, sec. 18, 2007 Colo. Sess. Laws 1511, 1517-18.

24. Act of June 1, 2009, ch. 328, sec. 4, 2009 Colo. Sess. Laws 1745, 1746.

25. COLO. WATER CONSERVATION BD., *supra* note 10, at app. A 2-3 (showing that the Colorado Corn Growers Association's DT Ranch project appears to be the only project that definitely seeks to implement a IWSA temporary transfer).

26. Pursuant to 2003 amendments, the Arkansas River Pilot Water Banking Act allows water banks in all water divisions in Colorado upon request by a water conservancy district. Arkansas River Pilot Water Banking Act, COLO. REV. STAT. § 37-80.5-101 to -102 (2001). To date, only the Arkansas River Basin has an approved water bank. *See* 2 COLO. CODE REGS. § 402-12 (2013) (noting Rules Governing the Arkansas River Water Bank Pilot Program). Similarly, the Colorado General Assembly has recently enacted legislation allowing a limited number of pilot projects effectuating temporary lease-fallowing transfers. *See* Act of May 13, 2013, ch. 210, sec. 2, 2013 Colo. Sess. Laws 878.A certain form of Substitute Water Supply Plans ("SWSP") has allowed temporary transfers of water rights in the past. *See* COLO. REV. STAT. § 37-92-308(5)(a) (2012). However, it is unclear how that authority could be used for such temporary transfers in the future, as the IWSA statute now exists. Accordingly, the IWSA statute is the only practical alternative to "buy and dry" available statewide. COLO. REV. STAT. § 37-92-309 (2013).

27. *See* COLO. WATER CONSERVATION BD., *supra* note 10, at app. B 11-12 (discussing extension of IWSAs for use in the rotational fallowing projects).

existing IWSA statute in order to understand the current legal framework for temporary changes of water rights in Colorado; (II) analyze the Aurora - High Line Canal Lease Agreements to obtain a better understanding of how and why parties might utilize such temporary changes; and (III) discuss some of the observations and lessons learned from those water leases. This article seeks to provide practitioners with useful tips and considerations regarding temporary water rights transfers, while commenting on the potential utility of temporary changes and how such changes may become a more useful component of Colorado water use.

II. EXISTING IWSA STATUTE

The Colorado Revised Statutes section 37-92-309 authorizes IWSAs.[28] The statute contemplates approval and operation of temporary changes pursuant to IWSAs without water court approval.[29] Instead, the Colorado State Engineer's Office ("SEO") reviews, approves, and administers IWSA temporary changes.[30]

However, the SEO has limited authority. The statute only applies to temporary changes that in no event permanently change a water right.[31] The SEO may only permit "temporary change[s] in the point of diversion, location of use, and type of use," and such IWSA changes may only apply in the case of absolute rights, not conditional rights.[32] Moreover, the SEO must deny any proposed temporary change if it will require adjudication by the court.[33]

A. THE APPLICATION AND AGREEMENT

The statute defines an IWSA as "an option agreement between two or more water right owners . . . ."[34] Thus, the IWSA statute regulates not only the temporary uses of water, but also the nature of the contractual relationship between the parties. The statute classifies the potential parties as the "owner of the loaned water right" and the "borrowing water right owner," and defines any operation of the temporary change as an exercise of an option to lease a water right.[35] Amendments to the statute in 2013 further defined "loaned water right" as "any identified water right, or identified portion of a water right, specifically described in the interruptible water supply agreement."[36] The parties to such an agreement still have wide latitude to propose contract terms unique to their situation, so long as the form of the transfer operates as an option to exercise a lease of a specific water right.

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28. COLO. REV. STAT. § 37-92-309 (2013).

29. "The general assembly hereby finds, determines, and declares that there are certain circumstances under which administrative approval of the use of interruptible water supply agreements can maximize the beneficial use of Colorado water resources without the need for an adjudication and without injury to vested water rights or decreed conditional water rights." § 37-92-309(1). Nonetheless, the water courts have jurisdiction to judicially review appeals of SEO determinations made pursuant to the IWSA statute. § 37-92-309(4)(a).

30. § 37-92-309(3).

31. § 37-92-309(1).

32. § 37-92-309(3).

33. *Id.*

34. § 37-92-309(2)(a).

35. *Id.*

36. § 37-92-309(2)(b).

An IWSA's approval begins with an application.[37] The statute does not expressly provide application requirements, except that an application must include a "detailed written report, prepared by a professional engineer" at the time of filing.[38] The report must evaluate the water right's historical consumptive use, return flows analysis, and any potential injuries to other water rights that may result from the exercise of the IWSA if approved. [39]

However, the statute also requires that the interruptible water supply agreement - as opposed to the application - quantify the loaning water right's historical consumptive use, and describe the land where the consumptive use occurred.[40] If the loaned right is an irrigation right, the agreement shall include a plan preventing erosion and blowing soils, and describe how the agreement will comply with all local county noxious weed and land use regulations.[41]

B. NOTICE AND COMMENT

The application process bears many similarities to the resume-notice procedures that the Colorado Water Courts use,[42] as well as the publication procedures that other western states utilize for changes of water rights.[43] The applicant must provide written notice of the application via mail or email to all parties who have subscribed to a notification list for the water divisions in which the water right is currently located and where it is proposed to be temporarily used.[44] Applicant must file proof of such notice with the SEO.[45]

Owners of water rights[46] have thirty-five days after such notice to provide the SEO with comments regarding the proposed IWSA.[47] Any claims of injury, and any terms and conditions that a party believes should be included in the proposed IWSA in order to protect their water rights from injury must be raised in these comments[48]

In 2013, the Colorado General Assembly passed amendments to the IWSA statute that changed the notice and comment procedures under certain

37. § 37-92-309(3)(a).

38. *Id.*

39. *Id.*

40. § 37-92-309(3)(b).

41. *Id.*

42. § 37-92-302(3)(a).

43. *See* MONT. CODE ANN. § 85-2-307 (2013); UTAH CODE ANN. § 73-5-13(4) (West 2013); WASH. REV. CODE § 90.03.280 (2013); WYO. STAT ANN. § 41-3-104 (2013).

44. COLO. REV. STAT. § 37-92-309(3)(a) (2013).

45. *Id.*

46. Unlike water court proceedings, in which all "persons" have standing to participate, standing to oppose an IWSA application is defined instead by ownership of, and potential injury to, an existing water right. *Compare* Buffalo Park Dev. Co. v. Mountain Mut. Reservoir Co., 195 P.3d 674, 687 (Colo. 2008) (discussing standing to participate in water court proceedings), *with* COLO. REV. STAT. § 37-92-309(3)(a) (2013) (establishing which parties may file comments with the SEO pertaining to IWSA applications). Moreover, holders of conditional water rights may have limited standing to participate in IWSA proceedings as well. *See* COLO. REV. STAT. § 37-92-309(3)(a) (2013) (noting that the statute only protects decreed conditional water rights from injury "if such conditional rights will be exercised during operation of the interruptible water supply agreement").

47. § 37-92-309(3)(a).

48. *Id.*

circumstances.[49] Section III discusses those amendments in greater detail.

C. STATE ENGINEER'S DETERMINATION

The SEO considers the application and comments and makes a determination on the application.[50] Although the IWSA statute does not require a formal hearing or proceeding on the matter, it does allow a hearing at the SEO's discretion.[51]

Specifically, the SEO determines whether the operation and administration of the proposed IWSA will: (I) "effect only a temporary change in the historical consumptive use of the [loaning] water right;" (II) "not cause injury to other water rights;" and (III) "not impair compliance with any interstate compact."[52] Furthermore, the SEO need not merely approve or deny an application.[53] In its discretion, the SEO may impose any terms and conditions necessary to meet the three statutory standards.[54]

D. APPEAL OF SEO DETERMINATION

After approving or denying any IWSA, the SEO must mail (or e-mail) a copy of its decision to all parties to the application.[55] Any party to the application may appeal the decision to the water court of the applicable water division.[56] Parties must make such appeals within thirty-five days of the mailing of the decision.[57]

Procedurally, the water court must comply with Colorado Revised Statutes § 37-92-304 and § 37-92-305, the same statutes governing court procedures in other water matters.[58] The IWSA statute deems the IWSA "proponent" – presumably the IWSA applicant – as the "applicant" for purposes of Colorado Revised Statutes § 37- 92-304 and § 37-92-305.[59]

Although the standards and procedures the water court uses for this matter do not substantially differ from other matters before the water court, an IWSA appeal differs in two notable ways. First, the IWSA statute requires that the water judge determine such appeals under the same procedures for determining matters referred to the water judge by the water referee.[60] Thus, the water judge hears IWSA appeals directly, and the appeal will spend no time on the water referee's docket. Second, the IWSA statute directs the water judge to expedite the appeal.[61]

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49. Act of Jun. 4, 2013, ch. 415, 2013 Colo. Sess. Laws (2013).
50. COLO. REV. STAT. § 37-92-309(3)(b) (2013).
51. *Id.*
52. *Id.*
53. § 37-92-309(4)(a).
54. § 37-92-309 (3)(b).
55. § 37-92-309(4)(a).
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. *Id.*
61. *Id.*

The scope of any appeal is solely the issue of injury resulting from the operation of the proposed IWSA.[62] The water judge applies the same legal standards in that injury inquiry as in any other water matter; specifically, the water judge must apply the injury standards provided in Colorado Revised Statutes § 37-92-304 and § 37-92-305.[63] The IWSA statute provides that "[n]either the approval nor the denial of the agreement by the state engineer shall create any presumptions, shift the burden of proof, or serve as a defense in any legal action that may be initiated concerning the interruptible water supply agreement."[64] Consequently, the applicable procedures and standards of Colorado Revised Statutes § 37-92-304 and § 37-92-305 require the proponent of an IWSA to establish a *prima facie* case of no-injury to existing water users without the benefit of administrative deference to the prior SEO decision.[65]

The IWSA statute goes to great lengths to ensure that an IWSA appeal will have no issue preclusive effect in separate legal actions: "the water judge shall not deem any failure to appeal all or any part of the decision of the state engineer or failure to state any grounds for appeal to preclude any party from raising any claims of injury in a future proceeding before the water judge."[66]

E. OPERATION OF THE IWSA

If the IWSA is approved, the borrowing water right owner may exercise the IWSA option to lease up to three times during a ten-year period.[67] The ten-year period begins running at the time the IWSA is approved.[68] Each time the borrowing water right owner exercises the option, he or she may divert and use the loaned water right for its temporarily changed purpose during the next water year.[69] Such operation remains subject to the priority system and the terms of the approval by the SEO.[70]

However, the IWSA statute requires the borrowing water user to determine if he or she will exercise the option in any given year no later than March 1.[71] If the borrowing water user decides to exercise the option, he or she must provide notice by March 1 of that year to all parties that submitted comments on the application.[72]

F. RENEWED COMMENTS ON INJURY

After the borrowing water right owner has exercised and operated the IWSA for the first time, any party to the original IWSA application may file additional comments with the SEO concerning the potential injury to its water

62. *Id.*
63. *Id.*
64. *Id.*
65. § 37-92-304(3); §§ 37-92-305(c)(II), (d); § 37-92-309(4)(a).
66. § 37-92-309(4)(a).
67. § 37-92-309(3)(c).
68. *Id.*
69. § 37-92-309(2)(a)(II).
70. *Id.*
71. § 37-92-309(3)(d).
72. *Id.*

rights due to the operation of the IWSA.[73] Parties may file such comments only after the first time the borrowing water right owner exercises the option. The parties must submit the comments no later than January 1 of the following year.[74] Such comments will initiate the same notice and comment, SEO determination, and water court appeal process as the initial application required.[75] In essence, potentially injured water rights holders may renew their objections to the operation of the IWSA, presumably to address potential injury actually experienced during the initial operation of the IWSA.

III. 2013 AMENDMENTS TO THE IWSA STATUTE

In the 2013 legislative session, the Colorado General Assembly enacted an amendment to the IWSA legislation that created the ability to renew an IWSA for up to two additional ten-year periods.[76] Prior to 2013, if the borrowing water right owner exercised the IWSA option at any time during the approved ten-year period, no future IWSA could include the subject water right.[77] If a borrowing water right owner, however, never exercised the IWSA during the ten-year period, he or she could renew that same IWSA once under the same application process described above.[78]

A. UP TO TWO RENEWAL APPLICATIONS PERMITTED

The 2013 amendment now allows a limited number of renewals of previously approved IWSA plans.[79] The amendment made no changes to the provision that allows an applicant to make one renewal application for an IWSA that a borrowing water right owner never exercised during the initial ten-year option period.[80] However, the 2013 amendments added subsection six, which allows an applicant to re-apply for up to two additional renewals of an IWSA, irrespective of whether the borrowing water right user had exercised the IWSA.[81] The ability to renew the IWSA pursuant to subsection six comes with additional procedural safeguards and requirements, which are listed below.[82]

B. "RESUME NOTICE" PUBLICATION

Renewal applications must now include a resume of the renewal application that applicants file with the water clerk in the water division(s) in which the loaned water right is located.[83] The water clerk then publishes the resume "in

73. § 37-92-309(4)(b).
74. *Id.*
75. *Id.*
76. Act of Jun. 5, 2013, ch. 415, 2013 Colo. Sess. Laws (2013).
77. COLO. REV. STAT. § 37-92-309 (2012).
78. *Id.*
79. Act of Jun. 5, 2013, ch. 415, sec. 3(c), (6)(b), 2013 Colo. Sess. Laws (2013).
80. *Compare* COLO. REV. STAT. § 37-92-309(3)(c) (2012), *with* COLO. REV. STAT. § 37-92-309(3)(c) (2013).
81. COLO. REV. STAT. § 37-92-309(6)(b) (2013).
82. *See* COLO. REV. STAT. §§ 37-92-309(6)(c)-(g) (2013); *see also* COLO. REV. STAT. § 37-92-309(6)(a)(I) (2013) (establishing that all of the "substantive and procedural requirements" of an initial IWSA application still apply to renewal applications).
83. COLO. REV. STAT. § 37-92-309(6)(c)(I).

the manner set for in [Colorado Revised Statutes] §§ 37-92-302(3)(a) and (3)(b) . . . ."[84] Colorado Revised Statutes §§ 37-92,302(3)(a) and (b), known as the resume notice provisions, are the same notice provisions through which the water courts exercise their exclusive jurisdiction over *in rem* water proceedings.[85] The statute makes clear that the water clerk has the authority to publish the resume notice, "notwithstanding the fact that the applications were filed with the state engineer."[86] Applicants still file renewal applications with the SEO, and must now provide the SEO's office with proof of the resume's submission to the water clerk.[87]

The amended provisions specifically require renewal applicants to comply with the pre-amendment notice requirements previously discussed in this article.[88]

The deadline for providing comments on renewals is approximately eighty-five days longer than the deadline for providing comments on an initial application.[89] As a result of utilizing resume notice, the statute now provides: "[o]wners of water rights have until the last day of the fourth month following the month in which the resume was submitted to the water clerk to file comments . . . ."[90] While an in-depth discussion of resume notice procedures is not relevant here, this format closely parallels the water court's existing resume notice procedures pursuant to Colorado Revised Statutes § 37-92-302(3).[91]

C. ADDITIONAL SEO CRITERIA FOR REVIEW

1. No Renewal IWSAs May Export Transmountain Water

The amendment prohibits the SEO from approving any renewal application that would seek to "transfer or facilitate the transfer of water across the continental divide by direct diversion, exchange, or otherwise."[92] Colorado practitioners commonly refer to transfers across the Continental Divide as "transmountain diversions."[93]

2. No Reliance Upon Multiple IWSAs as a Source of Primary Water Supply

The SEO may not approve any renewal application that would allow a "borrowing water right user to rely on the exercise of multiple interruptible water supply agreements as its primary source of supply."[94] In other words, water users cannot obtain and operate multiple IWSAs as their "primary" water supply, as opposed to obtaining a source of long-term water supply.

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84. *Id.; see also* COLO. REV. STAT. §§ 37-92-302(3)(a)-(b) (2012).

85. §§ 37-92-302(3)(a)-(b); *see also* S. Ute Indian Tribe v. King Consol. Ditch Co., 250 P.3d 1226, 1241-43 (Colo. 2011) (Rice, J., dissenting) (discussing the court's interpretation of resume notice procedures).

86. COLO. REV. STAT. § 37-92-309(6)(c)(I) (2013).

87. § 37-92-309(6)(c)(II).

88. §§ 37-92-309(3)(a), 37-92-309(6)(c)(III).

89. *Compare* § 37-92-309(3)(a), *with* § 37-92-309(6)(d).

90. § 37-92-309(6)(d).

91. *See* COLO. REV. STAT. §§ 37-92-302(3)(a)-(b) (2012).

92. § 37-92-309(6)(e).

93. *See* City of Florence v. Bd. of Waterworks of Pueblo, 793 P.2d 148, 153 (Colo. 1990).

94. § 37-92-309(6)(f)(I).

3. Renewal Terms and Conditions No Less Restrictive than Previously Imposed Terms and Conditions

The SEO cannot approve any renewal application that includes terms and conditions less restrictive than the terms and conditions of a previously authorized IWSA.[95] This provision assures water users who have commented on a previous IWSA application that a renewal will, at the very least, include all of the previously imposed terms and conditions. Thus, past opposers of an IWSA application satisfied by the prior terms and conditions may decide not to participate in renewal applications.

4. No Renewal of IWSA in Which the Loaned Water Rights are Already Included Under a Separate IWSA, or Where the Loaned Water Rights Have Already Been Included in Two Prior IWSAs

The SEO cannot approve a renewal IWSA that includes a water right already approved for temporary use under a separate, unexpired IWSA.[96] Similarly, the SEO cannot approve a renewal IWSA, regardless of the applicant, that includes a water right approved for temporary use in two prior IWSA renewals.[97] Taken together, these provisions address concerns that applicants may try to use the renewal process to "stack" IWSAs, so that a water right could be put to temporarily changed purposes more than three times in a ten-year period (e.g., if a water right was exercised for temporary use in years one through three under "IWSA 1," then exercised in years four through six under "IWSA 2"). Colorado Revised Statutes section 37-92-309(6)(f)(III) protects against the lessor "stacking" his loaned water among several users, while Colorado Revised Statutes section 37-92-309(6)(f)(IV) protects against the borrowing water user "stacking" any given water right.

To avoid a situation where the SEO must deny a renewal of an IWSA where an applicant files a renewal application before the prior IWSA has expired, Colorado Revised Statutes section 309(6)(f)(IV) permits the SEO to grant a renewal that takes effect after the expiration of the prior IWSA term.[98] Accordingly, an applicant may plan ahead and begin seeking a renewal of an IWSA prior to the expiration of the currently operating IWSA, so long as the ten-year terms of the two IWSAs do not overlap.

D. APPEAL OF A RENEWAL IWSA

There are no major differences between an appeal of an initial IWSA and an appeal of a renewal IWSA.[99] However, there are a few clarifying provisions: a provision regarding court filing fees;[100] a clarification that the judge need only expedite the renewal appeal "upon the request" of a party;[101] and clarification that the SEO's approval or disapproval of the IWSA renewal constitutes final

95. § 37-92-309(6)(f)(II).
96. § 37-92-309(6)(f)(III).
97. § 37-92-309(6)(f)(IV).
98. *Id.*
99. *Compare* §§ 37-92-309(6)(g)-(i), *with* § 37-92-309(4)(a).
100. § 37-92-309(6)(i).
101. § 37-92-309(6)(h).

agency action subject to appeal.[102] In all other respects the appeal process of an initial IWSA still controls.[103]

IV. AURORA - HIGH LINE CANAL COMPANY LEASE

Colorado water users have not used IWSAs in any meaningful way since the enactment of the IWSA statute.[104] This section will discuss the temporary lease between the City of Aurora and the High Line Canal Company ("Aurora-High Line Canal Lease"), as that lease is the only agreement of which the authors are aware in Colorado.

Although the lease functioned as an IWSA, the SEO did not approve the Aurora-High Line Canal Lease pursuant to the IWSA statute.[105] On June 30, 2003, Aurora filed its initial application for the lease of water in 2004, including significant technical analyses required with the application.[106] That application sought to operate the lease agreement pursuant to Colorado Revised Statutes Section 37-92-308(5)(a), and not the IWSA statute. That decision was made because the Colorado General Assembly had only passed the IWSA statute a month before, on June 5, 2003.[107] Moreover, the IWSA statute at the time tied the operation of an IWSA to a governor's declaration of "drought or other emergency" in the loaned water right's county of origin or county of use.[108] Therefore, between the timing of the passage of the IWSA statute and the uncertainty of whether the governor would formally declare a drought under which the IWSA could operate, Aurora had already decided to file its application under separate statutory authority.[109] Knowing this, it may seem strange to discuss the Aurora-High Line Canal Lease in conjunction with the IWSA statute. But in practical effect, the lease agreements operated similarly to the exercise of an IWSA and the review of the application followed a substantially similar process to that described in the IWSA statute.

By way of background information, Aurora is a large municipality (Colorado's third largest city) located in the South Platte River Basin, just east of Denver, Colorado.[110] As of 2012, Aurora's utilities department, known as Aurora Water, serves a population of about 340,000.[111] While its service area supplies Aurora residents, its water collection system extends far across the state. Approximately fifty percent of Aurora's water supply derives from the South Platte

102. § 37-92-309(6)(g).

103. § 37-92-309(4)(a).

104. *See* Aurora Application, Water Year 2004, *supra* note 22, at 2; SEO Approval, Water Year 2004, *supra* note 22; ACWWA, ECCV &United IWSA Applications, *supra* note 22; COLO. WATER CONSERVATION BOARD, *supra* note 22, at 12 tbl.2.

105. SEO Approval, Water Year 2004, *supra* note 22.

106. *See* Aurora Application, Water Year 2004, *supra* note 22; Letter from Ross Bethel, LLC, Prof'l Eng'r, to John Dingess, Duncan, Ostrander & Dingess, P.C. (June 30, 2003) (on file with *Water Law Review*) (attachment to Aurora Application, Water Year 2004) [hereinafter "Bethel Engineering Report, Water Year 2004"].

107. Act of Jun. 5, 2003, ch. 363, 2003 Colo. Sess. Laws (2003).

108. *Id.*

109. *See* Aurora Application, Water Year 2004, *supra* note 22.

110. *City of Aurora Facts*, DATA & DEMOGRAPHICS, https://www.auroragov.org/CityHall/AboutAurora/Demographics/index.htm (last visited Feb. 23, 2014).

111. *State and County Quick Facts: Aurora (city), Colorado*, UNITED STATES CENSUS BUREAU, http://quickfacts.census.gov/qfd/states/08/0804000.html (last visited Feb. 23, 2014).

River Basin, and the rest of its water comes, nearly equally, from the Colorado River Basin and the Arkansas River Basin.[112] In order to get that water to its service area, Aurora has an extensive water supply infrastructure. Aurora has several storage accounts in reservoirs located in the headwaters of the Arkansas River basin, near Leadville, Colorado.[113] Two types of sources fill the storage reservoirs: (I) several transmountain diversions exporting water out of the Colorado River basin and into these reservoirs, and (II) Arkansas River water rights directly stored or exchanged to these reservoirs.[114] The reservoir system then releases water into the Otero pipeline, a facility Aurora and the City of Colorado Springs jointly own.[115] Aurora pumps its water from the Arkansas River Basin into the headwaters of the South Platte River Basin, and then delivers its water into Spinney Mountain Reservoir.[116] Aurora's municipal intake connects to diversion structures located on the mainstem of the South Platte River, through which Aurora eventually diverts this water into its municipal system.[117]

A. 2002 DROUGHT

Understanding the Aurora-High Line Canal Lease requires some background history. In 2002, an exceptionally severe drought struck Colorado.[118] The drought was so severe that Colorado Governor Bill Owens proclaimed it to be "perhaps the worst drought in 350 years."[119] The winter of 2001 to 2002 was "abnormally warm and dry," leaving the May snowpack in the South Platte Basin at only twenty-three percent of normal, and twenty-eight percent of normal in the Upper Colorado Basin.[120] For Aurora, this resulted in very low raw water yields throughout the summer of 2002. Aurora received forty-four percent of normal raw water yields in May 2002, twenty-seven percent of normal raw water yields in June, and fifteen percent of normal raw water yields in July.[121] By July 2002, the year-to-date raw water yield was only thirty-five percent of the

112. Memorandum from Joe Stibrich, Deputy Director of Water Resources, Projected Demands and Estimated Firm Yield of Aurora's Water Supply System 2 (May 5, 2010) (on file with *Water Law Review*).

113. *See Aurora Water Basin Supply Map*, AURORA WATER, https://www.auroragov.org/cs/groups/public/documents/document/002339.pdf (last visited Feb. 23, 2014).

114. *Id.*

115. *See* AURORA WATER, WATER SUPPLY FACT BOOK 18 (2010-2011), *available at* https://www.auroragov.org/cs/groups/public/documents/document/002337.pdf.

116. *Fact Sheet - Spinney Mountain Reservoir*, AURORA WATER, https://www.auroragov.org/cs/groups/public/documents/document/002395.pdf (last visited Feb. 23, 2014).

117. *Id.*

118. JOHN HENZ ET AL., COLO. WATER CONSERVATION BD., DROUGHT & WATER SUPPLY ASSESSMENT, CH. 1: HISTORICAL PERSPECTIVES ON COLORADO DROUGHT 6 (2004), *available at* http://cwcb.state.co.us/technical-resources/colorado-drought-water-supply-assessment/Pages/main.aspx.

119. Press Release, Governor Bill Owens, State of the State Message 2003 (Jan. 16, 2003), http://www.state.co.us/owenspress/2003stateofstate.htm.

120. Douglas Kenney et al., *Use and Effectiveness of Municipal Water Restrictions During Drought in Colorado*, 40 J. OF THE AM. WATER RES. ASS'N. 77, 78-79 (2004).

121. UTILITIES DEPARTMENT MONTHLY REPORT, MAY 2002, WATER RES. DIV. (Aurora Water, May 2002) (on file with *Water Law Review*); UTILITIES DEPARTMENT MONTHLY REPORT, JUNE 2002, WATER RES. DIV. (Aurora Water, June 2002) (on file with *Water Law Review*); UTILITIES DEPARTMENT MONTHLY REPORT, JULY 2002, WATER RES. DIV. (Aurora Water, July 2002) (on file with *Water Law Review*).

expected year-to-date average.[122]

Moreover, like most Colorado front-range municipalities, Aurora relies heavily on storage reserves. Thus, the 2002 drought created concern not just about the availability of water for use in 2002, but also the availability of water in future years. If the drought significantly depleted storage reserves in 2002, concerns would persist well into 2003, and could subject Aurora to longer-term water supply issues. In May 2002, Aurora's total storage reserve was about twenty-seven percent lower than the storage reserve at the same time in 2001, and about forty-one percent lower than the storage reserve at the same time in 2000.[123] Both 2000 and 2001 were below-average water years as well.[124] By July 2002, Aurora's storage had dipped to about 70,000 acre-feet, or less than sixty percent of the prior year's July storage, and by that time it had become clear that there would be no other appreciable supply of water for the rest of the year.[125]

While 70,000 acre-feet of water may seem like a lot, Aurora's planning current criteria recommends that storage water not drop below 40,000 acre-feet.[126] This amount of water is about twenty-five percent of Aurora's storage capacity and roughly equivalent to Aurora's yearly indoor water demands.[127] Essentially, 40,000 acre-feet represents the minimum amount of water Aurora needed at that time to support its population's indoor domestic needs (i.e. toilets, sinks, and washing machines). Accordingly, by the middle of 2002, Aurora feared that another year of drought could impose severe water management plans.[128]

B. LEASES WITH THE HIGH LINE CANAL COMPANY

Aurora began exploring the possibility of obtaining short-term water supplies to fill their reservoirs as insurance against further drought conditions. Such plans were well advised, as the drought continued throughout the 2003 water year.[129] Aurora explored a lease from the Rocky Ford area High Line Canal Company as one option to supplement its water supply.

The High Line Canal Company operates in the Arkansas River Basin, with its canal headgate sitting on the mainstem of the Arkansas River about thirty-five miles downstream of Pueblo, Colorado.[130] The canal roughly parallels the Arkansas River, and is about ninety miles long. The maximum flow rate permitted, under all of the High Line Canal Company's priorities, is about 501 cfs.[131] The appropriation dates of these rights range between 1861 and 1890.[132]

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122. UTILITIES DEPARTMENT MONTHLY REPORT, July 2002, *supra* note 121.

123. UTILITIES DEPARTMENT MONTHLY REPORT, MAY 2002, *supra* note 121.

124. BARRY CRESS ET AL., COLO. WATER CONSERVATION BD., DROUGHT & WATER SUPPLY ASSESSMENT, CH. 3: IMPACT OF THE 2000-2003 DROUGHT AND STATE RESPONSE 4-6 (2004), *available at* http://cwcb.state.co.us/technical-resources/colorado-drought-water-supply-assessment/Pages/main.aspx.

125. UTILITIES DEPARTMENT MONTHLY REPORT, MAY 2002, *supra* note 121.

126. Stibrich, *supra* note 112, at 2.

127. *Id.*

128. *See id.* at 1-2.

129. *See id.* at 2.

130. Bethel Engineering Report, Water Year 2004, *supra* note 106.

131. *Id.*

132. *Id.*

Because of the over-appropriation of the Arkansas River for well over a hundred years, an 1880s priority is often a junior right, and a late 1880s right may only receive water during peak runoff.[133] The High Line Canal Company consists of 2,250 shares and has historically irrigated around 22,500 acres (i.e., about ten acres per share).[134] Recent cropping patterns indicated that the majority of crops grown were alfalfa (about forty-one percent), corn (about twenty-eight percent), grass (about fourteen percent), and wheat/oats (about nine percent).[135]

From Aurora's perspective, a lease with the High Line Canal Company was appealing because the necessary infrastructure to deliver water into its system already existed. Moreover, because Aurora had obtained separate permanent transfers of water from another nearby canal company, it had past experience in operating a transfer of water from the Rocky Ford area to the Aurora service area.[136] Thus, a water transfer from the High Line Canal Company was technically feasible.

As early as April 2003, Aurora had begun negotiations in earnest with the High Line Canal and its individual shareholders for a temporary lease of water. Over the course of three months, the parties worked out a uniform lease they would circulate and offer to all High Line Canal shareholders.[137]

1. Shares of the High Line Canal Company Subject to the Lease

Each shareholder that desired to lease shares to Aurora would designate, on a uniform lease agreement, a number of shares that they were willing to lease, as well as the location of the land those shares historically irrigated.[138] Each share of High Line Canal Company generally produced enough water to irrigate ten acres of land.[139] Under the terms of the lease agreement, each shareholder was responsible for obtaining the High Line Canal Company's approval of the lease, pursuant to the company's bylaws.[140]

2. Term of the Lease

The initial term of these leases included the remainder of the 2003 water year, the entire 2004 water year, and the 2005 water year up through November 14, 2005.[141] However, either party could terminate the lease for the 2005 water year if they gave proper notice.[142] In the event of SEO administrative denial, or

133. Transcript of Proceedings Volume 1 at 139, Concerning the Application of Busk-Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 2013) (on file with *Water Law Review*).

134. Bethel Engineering Report, Water Year 2004, *supra* note 106.

135. *Id.*

136. *See* Completion Order at 3, City of Aurora, No. 83CW18 (Colo. Dist. Court, Water Div. 2 Mar. 23, 2001) (application for change of water rights).

137. *See* Agreement for Lease of Water Produced by High Line Canal Co. Stock 1 (2003) (on file with *Water Law Review*).

138. *Id.* at 1, 3.

139. *Id.* at 3.

140. *Id.* at 6.

141. *Id.* at 2.

142. *Id.*

if High Line Canal Company could not physically deliver water to Aurora, Aurora could terminate the lease.[143]

3. Payments to Leasing Shareholders

The lease mandated a required per-share annual lease payment of $5,280 and included a minimal non-refundable portion paid to leasing shareholders regardless of whether Aurora exercised the lease or not.[144] The non-refundable payment was due at the beginning of the water year.[145] Aurora withheld $500 of the annual lease payment, a little less than ten percent, contingent upon the leasing shareholders implementing weed control and land stabilization measures.[146] Aurora also agreed to pay an annual fee of $1,000 when the land was out of production.[147] This payment served to offset any reductions in agricultural yields resulting from the temporary non-irrigation of the land.[148] This annual fee was due at the beginning of the following water year.[149]

4. Dry-up, Weed Management, and Land Stabilization Requirements on Historically Irrigated Lands

In exchange for the lease of water, shareholders agreed to the non-irrigation and the non-production of crops (i.e. "temporary dry-up") on their historically irrigated land.[150] The parties agreed that each leased share should result in approximately ten acres of dry-up, subject to actual usage.[151] As a result of the temporary dry-up, the parties also agreed to certain weed control and land stabilization measures.[152] The leasing shareholder was responsible for undertaking such measures.[153] As previously mentioned, however, Aurora withheld a portion of the annual lease payment to ensure that these measures were followed. Moreover, pursuant to the terms of the lease, shareholders granted Aurora permission to enter the subject temporary dry-up lands and undertake any weed control and land stabilization measures as required, and Aurora could defray the associated costs through the withholding.[154] Notwithstanding the fact that such lands were actually dried up, the parties agreed that they expected such lands to be assessed as irrigated land, and that the leasing shareholders were responsible for any taxes on the property.[155]

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143. *Id.*
144. *Id.* at 3-4.
145. *Id.* at 4.
146. *Id.*
147. *Id.*
148. *Id.* at *5.*
149. *Id.*
150. *Id.* at 6.
151. *Id.*
152. *Id.*
153. *Id.*
154. *Id.* at 6-7.
155. *Id.* at 8.

5. Duty to Promptly Seek Administrative Approval

Aurora agreed to promptly investigate and request any administrative approvals required to temporarily transfer the leased shares to Aurora's service area.[156] The agreements stipulated that the terms of the lease would become effective upon Aurora successfully obtaining any such administrative approval.[157]

6. Engineering Analysis, and Terms and Conditions to Protect Non-Leasing Shareholders

In a separate agreement with the High Line Canal Company (as opposed to the agreements developed with individual shareholders) Aurora agreed to be responsible for developing the required engineering analysis, which it would provide to the High Line Canal Company for review.[158] The parties specifically agreed to certain general objectives of such an engineering analysis, including: determining recent use of the High Line Canal water rights as a basis for the temporary change, determining the seepage and evaporation losses associated with such use, evaluating any effects of the leases upon the non-leasing shareholders, and providing recommended terms and conditions necessary to protect such non-leasing shareholders.[159] Under the agreement, Aurora also provided funds to the High Line Canal to defray potential costs the High Line Canal incurred in its review of the leases, the engineering analysis, and the application for administrative approval.[160] Finally, the agreement between Aurora, the High Line Canal, and the individual leases provided that High Line Canal could require terms and conditions to prevent injury to non-leasing shareholders.[161]

C. ADMINISTRATIVE REVIEW AND GRANTED APPROVAL

By July 2003, Aurora had submitted an application to approve the temporary transfer for the 2004 irrigation season to the State Engineer's Office.[162] After Aurora provided notice, nine different commenters submitted eight comment letters.[163] Aurora provided follow-up responses and it appears the SEO considered both the comments and the responses in its decision to impose certain terms and conditions in its approval of the lease.

On January 30, 2004, the SEO granted approval of the temporary change pursuant to the substitute water supply plan statute: Colorado Revised Statutes § 37-92-308(5).[164] The plan approved the temporary transfer of up to 840 shares of the High Line Canal Company to Aurora, subject to the terms and conditions

156. *Id.*
157. *Id.*
158. Agreement between the City of Aurora, Colorado, Acting by and through its Utility Enterprise, and The High Line Canal Company Relative to the Agreement for Lease of Company Stock (Aug. 26, 2003) (on file with *Water Law Review*) [hereinafter "Aurora - High Line Canal Agreement"].
159. *Id.*
160. *Id.*
161. *Id.*
162. Aurora Application, Water Year 2004, *supra* note 22.
163. SEO Approval, Water Year 2004, *supra* note 22.
164. *Id.*

in the approval.[165] The plan required that any leased shares must result in dry-up of 9.82 acres per share (i.e. the measured average value of irrigated acreage per share under the High Line Canal).[166] If Aurora leased 840 shares, it would result in temporary dry up of at least 8,251 acres.[167]

The approval then established how much water the High Line Canal Company could temporarily transfer to Aurora. Transfers could occur during the historical irrigation season for the High Line Canal, and included monthly maximum consumptive use credits.[168] These credits were available for Aurora to transfer to its temporarily approved uses pursuant to the SEO approved plan. These maximum consumptive use credits amounted to roughly forty percent of the water historically available at the High Line Canal headgate, which the leased shares would have used.[169] In addition, the SEO applied a maximum annual consumptive use credit somewhat lower than the total of the monthly consumptive use credits.[170] Aurora was able to divert or exchange this consumptive use portion, as determined on a daily basis, into Pueblo Reservoir, Twin Lakes Reservoir, or Turquoise Reservoir.[171] Operation of such diversions or exchanges was subject to the terms and conditions of the approved plan.

The approval required that a portion of the leased shares continue to be diverted into the High Line Canal.[172] This amount represented the ditch losses the leased shares historically realized when conveying the water to the historical places of use. These ditch losses amounted to roughly thirty-six percent of the water historically available at the High Line Canal headgate, which the leased shares would have used.[173] In order to replicate the historic ditch losses, this amount continued to be diverted through the High Line Canal in similar fashion to its historic movement through the system, acting as carriage water to the unleased shares.[174]

The SEO determined that return flows accounted for the remaining roughly twenty-four percent of the water historically available at the High Line Canal headgate, which the leased shares originally used.[175] The SEO determined that ninety percent of these return flows were lagged ground water returns, and ten percent were tail water surface returns.[176] In order to replicate historic return flow patterns, several mechanisms were used to deliver return flows back to the stream, including direct releases to the stream, ground water recharge through High Line Canal Company ditches, and storage of return flows for later direct stream releases or use as recharge credits.[177] All of these

165. *Id.*
166. *Id.* at 2. .
167. *Id.*
168. SEO Approval, Water Year 2004, *supra* note 22.
169. *Id* at 2.
170. *Id.*
171. *Id.* at 6.
172. *Id.*at 4.
173. *See id.*
174. *See id.*
175. *See id.*
176. *Id.* at 4.
177. *See id.* at 4-5.

return flows were measured as generated on a daily basis.[178]

D. NET RESULT OF THE 2004 TEMPORARY TRANSFER

Aurora successfully leased 833.3 shares, or about thirty-seven percent, of the High Line Canal Company.[179] Aurora paid about $5.3 million to the High Line Canal Company and its shareholders.[180] Aurora spent additional monies to utilize Pueblo Reservoir.[181] As a result, the Superintendent of the High Line Canal Company, Dan Henrichs, was quoted as saying: "The lease was an overwhelming success. It was a financial help to shareholders. It added value to our water without harming ditch operations."[182] A board member of the High Line Canal was quoted as saying: "There have been a few guys saying that without this, they wouldn't be farming now. We had a meeting the other day, talking about the good and bad of the lease. You didn't hear much bad. It's worked out well for both of us."[183]

The authors of this article view the lease as a success, but note the success was tempered by the low return of water from the lease. Because the 2004 lease occurred during a low water year, Aurora only realized about 7,600 acre-feet from the lease.[184] Compared with the approximately 12,000 acre-feet that Aurora expected to obtain from the lease during an "average" water year,[185] the 7,600 acre-feet was somewhat of a disappointment. However, as a result of the lease, Aurora's storage reserves in January of 2005 were slightly over half full and within ten percent of what Aurora expected.[186] Accordingly, the lease was successful because it allowed Aurora to more quickly recover from the deleterious effects of the 2002 through 2004 water years. But due to the limited amount of water obtained from that lease, it is difficult to characterize the lease as an "overwhelming" success for the City of Aurora.

E. 2005 TEMPORARY TRANSFER

In late January 2005, Aurora filed an application for a renewal of the High Line Canal leases.[187] First, Aurora negotiated an assignment lease with Colorado Springs Utilities ("CS-U"), the municipal water supplier for the City of Colorado Springs, whereby CS-U would receive fifty percent of transferable yield of the

178. *Id.* at 3.

179. Chris Woodka, *Farmers Took Aurora Payments to the Bank*, PUEBLO CHIEFTAIN, Jan. 16, 2005 (on file with *Water Law Review*).

180. *See id.* at 6.

181. *Id.*

182. *Id.* at 3.

183. *Id.* at 6.

184. *Id.*

185. Letter from Austin Hamre, Esq., Duncan, Ostrander & Dingess, P.C., to Keith Vander Horst, Water Res. Eng'r, Office of the State Eng'r 2 (Mar. 7, 2005) (on file with *Water Law Review*) [hereinafter "Aurora Application, Water Year 2005"].

186. *See* Woodka, *supra* note 179.

187. Letter from Austin Hamre, Esq., Duncan, Ostrander & Dingess P.C. to Hal D. Simpson, State Eng'r, Colo. Office of the State Eng'r, Dep't of Natural Res., (Jan. 24, 2005) (on file with *Water Law Review*).

leased shares.[188] The sublease to CS-U made sense in that CS-U's existing infrastructure easily allowed deliveries of the subleased water to CS-U with minimal changes to the 2005 SWPS plan. Although Colorado Springs shares the same basin as the High Line Canal, the parties elected to continue treating all leased shares, including those received by CS-U, as fully consumable water supplies.[189] Thus, the amount of return flow obligations remained essentially the same.

Second, in addition to the previously utilized structures, the plan requested approval to use certain nearby downstream canal and reservoir systems (Holbrook Canal System, including Holbrook and Dye Reservoirs, and the Colorado Canal System, including Lakes Meredith and Henry).[190] The reservoir components of this plan would operate similarly to the role of upstream Pueblo Reservoir; it would store consumptive use credits for later exchange up into the Aurora and CS-U systems, and it would store return flows for release into the stream system later in the year.[191]

On March 15, 2005, the SEO approved the plan.[192] The SEO received two comment letters.[193] The SEO granted the 2005 approval on nearly identical terms and conditions as the 2004 approval.[194] The 2005 plan approved the assignment of half the leased water to CS-U, and approved the use of the additional structures subject to operational terms and conditions.[195] The only other change worth noting was the expanded language in the condition pertaining to temporary dry-up, which further restricted approved methods of dry-up.[196]

While 2005 was another below average water year, it was not as severe as 2004.[197] As of March 2005, Aurora was at fifty-three percent of its system-wide storage reserves, or under 84,000 acre-feet of total system-wide storage.[198] Therefore, the lease of water again made sense for Aurora. Because 2005 storage reserves looked better for Aurora than in the prior two years, Aurora assigned some of its lease to CS-U. As a result, Aurora again leased 833 shares in 2005 under the same payment terms.[199] Those shares produced a little over 10,000 acre-feet of transferable yield, which Aurora and CS-U split.[200]

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188. Memorandum from Ross Bethel, LLC, Prof'l Eng'r, to Austin Hamre, Esq., Duncan, Ostrander & Dingess, P.C. 3 (Jan. 24, 2005) (on file with *Water Law Review*) [hereinafter "Bethel Engineering Report, Water Year 2005"].

189. *Id.* at 8.

190. *Id.* at 2-3.

191. *Id.*

192. Letter from Dick Wolfe, P.E., Ast. State Eng'r, Colo. Office of the State Eng'r, Div of Water Res., Dep't of Natural Res., to John M. Dingess, Duncan, Ostrander & Dingess P.C. (Mar. 15, 2005) (on file with *Water Law Review*) [hereinafter "SEO Approval, Water Year 2005"].

193. *Id.*

194. *Id.*

195. *Id.* at 7-8.

196. *Id.*

197. NATIONAL CLIMATIC DATA CENTER, DEPT. OF COM., CLIMATE OF 2004 IN HISTORICAL PERSPECTIVE 3 (2005), http://www.ncdc.noaa.gov/oa/climate/research/2004/ann/ann04.html; NATIONAL CLIMATIC DATA CENTER, DEPT. OF COM., CLIMATE OF 2005 IN HISTORICAL PERSPECTIVE 2 (2006), http://www.ncdc.noaa.gov/oa/climate/research/2005/ann/ann05.html.

198. Aurora Application, Water Year 2005, *supra* note 185.

199. SEO Approval, Water Year 2005, *supra* note 192.

200. *Id.* at 4-5.

V. LESSONS LEARNED AND LIMITATIONS TO THE USE OF IWSAS

A. HISTORIC CONSUMPTIVE USE ANALYSIS

It will come as no surprise to water law practitioners that a primary concern in obtaining a successful IWSA is the Historic Consumptive Use ("HCU") analysis. An IWSA may only be a temporary transfer of water, but the transferable portion of the right remains that portion historically consumed.[201]

Issues pertaining to HCU analyses are common under the prior appropriation doctrine. Accurately quantifying the portion of the water right that may be changed, while ensuring that the water right is not expanded is an inherently contentious exercise. But, in many respects, there is little difference between an HCU analysis preformed for an IWSA application and one preformed in a permanent change application, particularly from the technical standpoint.[202] The major difference is that the SEO must review and approve the application instead of the water court, and the SEO will likely expect modifications to the HCU analysis before it grants approval.[203]

HCU analyses to effectuate temporary leases, however, raise some broader concerns that typically do not exist in the context of permanent changes. To understand these concerns, it is important to understand the purpose and effect of an HCU analysis under existing water law. Colorado water rights are usufructuary, limited to and measured by the historical beneficial use of the water.[204] The amount of water claimed in the original water right decree does not usually represent the actual historical beneficial use of the water, but instead represents the amount claimed by the water user at the time the right was decreed.[205] As a result, Colorado courts require a quantification of the amount of water that the water user historically, beneficially used under the water right, and will limit any change of a water right to that quantity of water which was consumptively used (i.e. HCU).[206] Unfortunately, the originally decreed amounts and the actual use of the water are not always the same.[207] Therefore, water users run the real risk of a reduction in their water right as the result of a quantification.[208]

1. The Potential Permanent Effects of a Temporary Change

Because of the risk of reduction from decreed use to actual use, water users avoid situations that will unnecessarily result in a quantification of their water rights. For agricultural users, a major concern with temporary leases is the requirement to quantify the water right. Although an IWSA seeks only a temporary change, it is difficult to provide assurances that a quantification will not have long-lasting effects on the underlying water right. Although a quantification preformed under an IWSA is not a binding adjudication of the underlying water

201. COLO. REV. STAT. § 37-92-309(3)(b) (2013).
202. Interview with Ross Bethel, LLC, Prof'l Eng'r. (Feb. 2, 2013).
203. *Id.*
204. Concerning Application for Water Rights of Midway Ranches Prop. Owners' Ass'n, Inc. (Midway), 938 P.2d 515, 522 (Colo. 1997).
205. *Id.* at 521.
206. Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 49, 54 (Colo. 1999).
207. *Id.* at 55.
208. *Midway,* 938 P.2d at 522.

right, other water users may utilize that quantification against the owner of the right as evidence in future proceedings. [209]

For example, the High Line Canal Company recently participated in a court trial concerning the change of the Busk-Ivanhoe transmountain water rights, which the High Line Canal Company historically used as a source of supplemental supply in its ditch system.[210] The High Line Canal Company was not the applicant in the proceedings, having sold the Busk-Ivanhoe water rights and replaced them with other sources of water some years before.[211] Nonetheless, the High Line Canal Company participated in the proceedings to ensure that any quantification of the High Line Canal Company's use of the Busk-Ivanhoe water rights would not result in a binding quantification of the High Line Canal's current water use.[212] Significantly, the data and technical assumptions generated in the creation of the HCU analyses used in the Aurora-High Line Canal Lease application were used (albeit in a highly modified fashion) by certain opposers in the Busk-Ivanhoe change case as a basis for their HCU analysis.[213] The results of a water right's quantification have significant impacts even when performed outside the context of a judicial adjudication of those water rights.

2. Controlling How and When an HCU Analysis is Pursued

The major lesson learned from the High Line Canal Company's position in the Busk-Ivanhoe trial was that the High Line Canal wanted control of how and when its water rights would be quantified.[214] That sentiment is unsurprising, but not always attainable. For many agricultural water users, high expense dissuades them from hiring a water engineer to determine the likely outcome of a ditch-wide HCU.[215] In addition, it is doubtful that agricultural water users would be comfortable in having potential third-party lessors conduct an HCU analysis on their water rights without their control or input. That discomfort may have increased substantially due to the recent outcome of the *Burlington* case.[216] After the *Burlington* decision, it became clear that a portion of shareholders of a mutual ditch company participating in a change of water rights could dramatically affect the rights of every shareholder and water right on the ditch.[217]

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209. *See* COLO. REV. STAT. §§ 37-92-309(3)(b), (4)(a) (2013).

210. *See* Applicant's Trial Brief at 9, 22, Concerning the Application of Busk -Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 July 2, 2013); *see also* Trial Brief of High Line Canal Co. at 1, Concerning the Application of Busk -Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 July 2, 2013).

211. *See* Applicant's Trial Brief, *supra* note 210, at 1, 3; *see also* Trial Brief of High Line Canal Co., *supra* note 210, at 1-2.

212. *See* Closing Brief of Applicant at 9, 22, Concerning the Application of Busk -Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 July 2, 2013).

213. Transcript of Testimony of Mike Sayler at 721, Concerning the Application of Busk -Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 July 26, 2013).

214. Trial Brief of High Line Canal Co., *supra* note 210, at 1-2; Closing Brief of High Line Canal Co. at 2, Concerning the Application of Busk -Ivanhoe, Inc., No. 09CW142 (Colo. Dist. Ct., Water Div. 2 Aug. 29, 2013).

215. *See generally* COLO. CONSERVATION BD., *supra* note 13, at 7-19.

216. Burlington Ditch Reservoir & Land Co. v. Metro. Wastewater Reclamation Dist., 256 P.3d 645, 674 (Colo. 2011), *as modified on denial of reh'g* (June 20, 2011).

217. *Id.*

The issue of how and when HCU analyses are pursued is similarly concerning to the potential lessors of water rights. There is little interest among municipal water suppliers in paying for a quantification (or other costs associated with temporary changes) if it is unclear how much water it will supply.[218] Similarly, even when the lease is substantially certain to provide large amounts of water, municipal suppliers are unlikely to be interested in paying for a quantification or change of water rights if they lack authority over the process.[219]

In short, agricultural lessors have strong interests in controlling a quantification of their water rights, but have concerns with their ability to pay for such quantification on their own. Municipal lessees have the potential resources to pay for a quantification, but only if the potential lease is sufficiently large to warrant such costs and the municipal lessors have sufficient authority or input over that process.

3. Potential Solutions to HCU Concerns

Potential agricultural lessors and potential municipal lessees may agree on how to pursue an HCU analyses in many different ways. This section highlights the one utilized in the Aurora-High Line Canal IWSA, as well as discussing three other proposals.

a. Negotiated Agreement

In the Aurora-High Line Canal IWSA, the parties entered into a negotiated agreement that specifically addressed many of the issues associated with an HCU analyses. Under that agreement, Aurora commissioned and was responsible for providing an engineering report to the High Line Canal Company concerning quantification of the High Line Canal water rights.[220] The agreement specified several requirements, which were concerns of the High Line Canal Company, such as proposed terms and conditions that would protect non-leasing shareholders.[221] In addition, Aurora made payments to the High Line Canal Company for engineering purposes, allowing High Line Canal Company to perform an independent review of the engineering report.[222] In return, High Line Canal Company committed to promptly review the engineering report and work in good faith with Aurora and its shareholders to approve any temporary leases of shares.[223] Aurora was also able to freely terminate the agreement, along with any resulting payments that had not yet come due, if it decided the leases were infeasible.[224] Under the circumstances of this lease, a negotiated agreement provided sufficient assurances for the parties to proceed with an HCU analysis. Based on this experience, it appears that potential lessors and potential lessees are able to contractually resolve potential concerns over an HCU analyses, so long as they have the ability and the interest in doing so.

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218. COLO. CONSERVATION BD., PROJECT COMPLETION REPORT: FLEX MARKET MODEL PROJECT COMPLETION REPORT 5-3 (2013).

219. *Id.*

220. Aurora - High Line Canal Agreement, *supra* note 158, at 3.

221. *See id.*

222. *See id.*

223. *See id.*

224. *See id.*

b. Proposed Ditch Wide HCU Legislation

One recent proposal to the Colorado Interim Water Resources Review Committee[225] was the creation of a "ditch-wide" change statute.[226] The proposed statute would legislatively incentivize agricultural water users to preform ditch-wide[227] HCU analyses on their water rights.[228] The underlying premise of the proposal is that a quantification of water rights is a key impediment to the acceptance of temporary changes of water rights. In addition, agricultural interests will be more likely to risk the ramification of a ditch-wide HCU analysis if there are statutorily guaranteed incentives at the outset.

The authors of this article believe the idea, in principal, has merit. In particular, the authors agree that agricultural water users have historically avoided water transactions requiring ditch-wide HCU analyses. If agricultural users adequately quantify their water rights prior to entering into a temporary change agreement, parties will resolve one of the major hurdles facing that temporary change.

The authors, however, also have concerns with certain types of incentives promoting ditch-wide analyses, and urge careful consideration of any potential incentives. Incentives which effectively force all owners of a water right to participate in a ditch-wide analysis, when either the ditch company or a majority of the shareholder's oppose doing the analysis is not something the State of Colorado should endorse. Nor should Colorado endorse incentives that allow ditch-wide quantifications to enlarge the underlying water right at the expense of other water users. Incentives that do not operate at the expense of other water users surely exist, and very well could result in less angst over the outcome of a potential HCU analysis.

c. Monetary or Technical Support for HCU Analyses

Providing water users with technical or financial support in performing HCU analyses would incentivize HCU analyses in advance of any temporary change. Theoretically, the State of Colorado does not need to tie such assistance to a water court proceeding, although such a proceeding would ensure a greater level of certainty to the outcome.[229]

Since 2007, the Colorado General Assembly has appropriated over

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225. *See* COLO. REV. STAT. § 37-98-102 (2013) (authorizing this interim committee of the Colorado General Assembly, which generally oversees all water resource matters).

226. *See* Water Res. Review Comm., Flex Water Market Presentation (Aug. 21, 2013), http://www.colorado.gov/lcs/WRRC; *see also Staff Summary of Meeting* (Water Res. Comm.) Aug. 21, 2013, at 3, *available at* http://www.leg.state.co.us/CLICS/CLICS2013A/commsumm.nsf/b4a3962433b52fa787256e5f00670a71/3e8f1a8bb6445df287257bd200666d83 (last visited Feb. 20, 2014).

227. By way of explanation, "ditch-wide" quantifications involve the quantification of all rights and water users on a ditch. The alternative, sometimes referred to as "parcel-by-parcel" quantification, involve each individual water right or user on the ditch quantifying their portion of the whole right.

228. *See* Flex Water Market Presentation, *supra* note 226; *see also* Staff Summary of Meeting, *supra* note 226, at 3.

229. *See* Midway, 938 P.2d 515, 525 (Colo. 1997) (discussing Water Court jurisdiction over quantification of water rights, as well as the claim and issue preclusive effects of such rulings).

$3,000,000 for studies incentivizing alternative transfer mechanisms.[230] A cursory review of the grant recipient projects reveals that quantification of water rights and quantification of dry-up are significant aspects of most projects.[231] If the statewide commitment to temporary changes is that significant, perhaps the Colorado General Assembly can continue to make funding available for ditch-wide HCU analyses. Such a program could allow agricultural users to pursue HCU analyses without the need of a buyer or lessor of water to fund those efforts.

d. Standardized HCU Analyses

Implementing standardized HCU analyses is another potential solution for reducing barriers to temporary changes. Theoretically, reducing the number of variables considered in HCU analyses would create more certainty in the outcome. Colorado has only recently attempted to develop a standardized HCU analyses, but only in the context of a temporary lease-fallowing pilot project.[232] It is unclear how well these standardized HCU assumptions will operate, as an application has yet to be granted under that pilot project.[233] Nonetheless, Colorado already has some experience in working with standardized HCU assumptions or parameters developed for purposes other than change cases, most notably the H-I Model in the Arkansas River Basin.[234]

A standardized HCU analysis raises concerns. Such models may value simplicity in the modeled analyses, and assumed uniformity of historic usage, over the necessity of a complex model based upon specific, accurate data. Inaccurate or overly simplified models could result in inaccurate and unfair results for water users. Montana provides just such an example.

Montana's Department of Natural Resources and Conservation ("DNRC"), the regulatory agency governing changes of water rights,[235] recently promulgated rules governing changes of water rights that included a standardized HCU analyses.[236] Under the new rules, an applicant must select values from a table based upon: (I) the nearest department-approved climate station to the place of use; (II) whether irrigation at the place of use was either 'center pivot' or 'non-center pivot' irrigation; and (III) the county-by-county "Management Factors" for the place of use.[237]

By way of example, suppose an applicant owns one hundred acres of flood irrigated ranch in Cascade County, Montana. The applicant might determine under the rules, based on proximity and elevation, that the "Sun River" weather

230. Act of May 31, 2007, Ch. 352, sec. 18, Colo. Sess. Laws 1511, 1517-518; Act of Jun 1, 2009, Ch. 328, sec. 4, Colo. Sess. Laws 1745, 1746.

231. COLO. WATER CONSERVATION BD., *supra* note 22, at 1-2.

232. *See* Act of May 13, 2013, ch. 210, sec. 2, 2013 Colo. Sess. Laws 878; COLO. WATER CONSERVATION BD., CRITERIA AND GUIDELINES FOR FALLOWING -LEASING PILOT PROJECT (2013), http://cwcb.state.co.us/water-management/water-projects-programs/Pages/Fallowing-LeasingPilotProjects.aspx (last visited Feb. 21, 2014).

233. COLO. WATER CONSERVATION BD., *supra* note 232.

234. *See* Kansas v. Colorado, 543 U.S. 86, 99 (2004); Fifth and Final Report Judgment and Decree at 2-5, Kansas v. Colorado, 556 U.S. 98 (2008) (No. 105).

235. *See* MONT. ADMIN. R. 36.12.1902 (2014).

236. *See id.*

237. *See id.*

station is most representative of the place of use.[238] The DNRC calculated the seasonal irrigation requirement for non-center pivot irrigation at this climate station to be 18.10 inches.[239] Under the rules, the historic use Management Factor for Cascade County is 57.3 percent.[240] The rules direct the applicant to multiply the irrigation requirement, Management Factor, and the total number of acres to determine the historic consumptive use volume.[241] In this case, by administrative rule, the presumptive historic consumptive use for the water rights that irrigate this ranch is 86.4 acre-feet. (E.g., [18.10 inches x 57.3% x 100 acres] / 12 inches per foot = approximately 86.4 acre-feet.)

The problem with the rules is DNRC's Management Factors. The purpose of the DNRC's calculated Management Factors is to reduce the maximum evapotranspiration calculations, which are premised upon ideal management of crops and ideal water supply conditions.[242] Such a reduction theoretically results in closer approximations of the actual irrigation water a crop consumes.[243]

However, the method by which the DNRC calculated the Management Factors is suspect at best. The DNRC established the Management Factors by comparing the average irrigated crop production yields (as reported to the USDA by farmers in each county) to a DNRC-calculated maximum irrigated crop production yield.[244] This comparison, expressed as a percentage, represents how closely the average reported irrigated production in a chosen county matches the average expected maximum production. The DNRC calculates a maximum irrigated yield on a hypothetical location for each county that would experience what the DNRC determined to be the 'average' characteristics of that county.[245] Two concerns stem from this analysis. First, it is unclear whether a collection of all the countywide "average" statistics, when put together into one analysis, would be in any way meaningful or representative for the majority of water users in that county. Second, even if such a collection of averages is meaningful, the resulting Management Factors for each county would represent an average historic crop yield for every irrigated property in that county. Thus, compliance with the DNRC Management Factors limits every water right to only that volume of water necessary to produce an "average" irrigated crop yield.

Returning to the hypothetical ranch in Cascade County, assume that the rancher wants to take his current flood irrigation out of production and move his water rights to a nearby field where he will use gated pipe. Under the new rules, there is a separate Management Factor for new irrigation use, and in Cascade County that factor is 78.8 percent.[246] Accordingly, pursuant to the standardized HCU, the rancher will be limited to seventy-three acres of irrigation in the new location as opposed to the one hundred acres he was irrigating before.

238. MONTANA DEPT. OF NATURAL RES. AND CONSERVATION, *DNRC* CONSUMPTIVE USE METHODOLOGY 1,8 (2010).
239. *Id.*
240. *Id.* at 18.
241. *Id.* at 3.
242. *Id.* at 2-3.
243. *Id.* at 2.
244. *Id.* at 2-3.
245. *Id.* at 3.
246. MONT. ADMIN. R. 36.12.1902 (2014).

(E.g., [86.4 acre-feet x 12 inches per foot] / [18.10 inches x 78.8%] = approximately 73 acres.) This outcome is based *solely* on the DNRC premise that future irrigation *must* produce greater yields than those historically produced.

Montana's HCU rules are problematic because the regulations' imposed uniformity is not a means for accurately determining HCU of any given water right. Instead, the regulations transform every water right into a uniform "average" water right. Thus, Montana's HCU rules seem to operate in blissful ignorance of the fact that the entire prior appropriation doctrine relies upon the notion that in times of water scarcity some users will be fully satisfied and others will not.[247] Colorado should proceed more thoughtfully than Montana if it decides to standardize its HCU analyses.

B. MUNICIPAL PROVIDERS HAVE DIFFERENT WATER DEMANDS THAN AGRICULTURAL USERS

Temporary transfers are not necessarily well-designed for municipal interests, and alternative transfer mechanisms are perceived as a method of aiding agricultural interests.[248] Yet, for an alternative transfer mechanism to work, municipal and industrial water users must receive at least as much benefit under temporary transfers as they would obtain from permanent transfers. These kinds of water transfers will depend on willing sellers *and* willing buyers. Thus, establishing a legal framework for temporary changes that grossly favors either buyers or sellers will result in a lack of market participants for temporary transfers.

The authors perceive that some parties would seek to establish a temporary change market that favors agricultural users under the theory that municipal and industrial users will eventually agree to unfavorable lease terms.[249] By way of example, the City of Aurora agreed to lease pricing for 10,000 acre-feet of water from the Arkansas Valley Super Ditch.[250] The Super Ditch, however, later rejected the agreement and demanded different key terms to the lease, including

247. Kobobel v. State Dep't of Natural Res., 249 P.3d 1127, 1134-35 (Colo. 2011) ("Given the demand for water, there can never be a guarantee that there will be enough water to satisfy all claims to this scarce resource. Accordingly, not only is one's property right in water uncertain in nature, but its primary value is in its relative priority. Thus, adjudication and administration are essential to protection of water rights.") (internal citations and quotations omitted); *see also* Concerning Adjudication of Existing Water Rights to the use of all Water (Basin 41I), 55 P.3d 396, 399 (Mont. 2002) ("[t]he true test of appropriation of water is the successful application thereof to the beneficial use designed, and the method of diverting or carrying the same, or making such application, is immaterial" (quoting Thomas v. Guiraud, 6 Colo. 530, 533 (1883))); Atchison v. Peterson, 1 Mont 561, 569 (Mont. 1892).

248. COLO. WATER CONSERVATION BD., COLORADO'S WATER SUPPLY FUTURE, STATEWIDE WATER SUPPLY INITIATIVE – PHASE 2 3-13 (2007).

249. *See* Jay Winner & Mary Lou Smith, Colorado's "Super Ditch": Can Farmers Cooperate to Make Lemonade Out of Lemons, Address Before the United States Committee on Irrigation and Drainage (May 28-31, 2008), *available at* http://digitool.library.colostate.edu/R/?func=dbin-jump-full&object_id=117054&local_base=GEN01 ("The Super Ditch model, however, allows for the possibility of greater bargaining power than if individual ditch companies are played against each other by municipalities attempting to get the best price.").

250. Chris Woodka, *Upping the Ante*, PUEBLO CHIEFTAIN, Jan. 27, 2013, http://coyotegulch.files.wordpress.com/2013/01/upping-the-ante-pueblo-chieftain-woodka.pdf; Chris Woodka, *'We're Still Unified,' Farmers Want a Better Rate for Water in Possible Aurora Lease*,

an increase of the lease price.[251] Representatives of the Super Ditch stated that regardless of prior agreements, the Super Ditch expected higher lease rates. As a result, the parties were unable to reach a deal.[252] It is unclear whether agricultural interests fully understand the needs of municipal water suppliers, especially the importance of certainty for municipalities.

To that end, the following represents needs that municipal water suppliers must have addressed in any water supply transaction. This is not an exhaustive list, and the importance of particular interests balance differently for each municipal water supplier.

(1) Municipalities demand a year-round water supply, and in Colorado, the vast majority of yearly supply is limited to spring runoff.[253] Although municipalities can rely upon snowpack forecasting, existing storage reserves, and restrictions on certain outdoor uses to balance demands against annual supplies,[254] those tools do not change the fact that municipalities face considerable uncertainty in budgeting their annual supply of water.

(2) Municipalities need to plan the operation of its system on a multi-year basis. Because a municipality's annual supply occurs during a relatively short period of time, municipal water suppliers must make significant operational decisions far in advance of spring runoff, largely based on predictions.[255] The impacts of incorrectly forecasting supply continue to effect municipal water suppliers long after any given irrigation season, sometimes effecting municipal operations for years afterwards.[256]

(3) Municipal water suppliers must provide water for a variety of uses. There exists some flexibility to prioritize or limit some types of use, like lawn irrigation. There is, however, very little ability to curtail other uses, notably drinking water supply. Moreover, because municipal water suppliers do not directly control the end water use (i.e. what comes out of a tap), municipal water suppliers face difficulties in effectuating these restrictions.[257]

(4) Municipal suppliers face a very high expectation for reliable supply. Some agricultural users may argue this point, but it is difficult to dispute that over 320,000 people of the City of Aurora need drinking water on a daily basis to survive.

(5) Municipal water demand is highly variable. But, populations of humans have a tendency to use water at the same times.[258] For this reason, domestic water supply is much like an interstate: you design and operate the system to

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PUEBLO CHIEFTAIN, Jan. 4, 2013, http://coyotegulch.files.wordpress.com/2013/01/were-still-unified-pueblo-chieftain-woodka.pdf.

251. *Id.*

252. *Id.*

253. Kenney, *supra* note 120, at 78.

254. *Id.* at 78-79.

255. Marc D. Waage, et al., Water Res. Eng'r, Incorporating Seasonal Stream Flow Forecasts into Operational Decision Making, Presented at Proceedings of the 69th Annual Western Snow Conference (April 2001), *available at* http://snobear.colorado.edu/WSC/WSC_2001/PDF/WSC2001WaageEtAl.PDF.

256. *See* Kenney, *supra* note 120, at 79.

257. *See* Bruce Finley, *Colorado Rolls out More Water-Saving Tactics as Conservation Efforts Pay Off*, DENVER POST, June 25, 2011, http://www.denverpost.com/ci_18350339.

258. *See* Rich Calder, *Toilet Bowl XLVI*, N.Y. POST, Feb 9, 2012, http://nypost.com/2012/02/09/toilet-bowl-xlvi/.

meet peak demands. Municipalities have to have a sufficient supply of water to meet peak demands.

(6) Many municipal and industrial water suppliers face problems associated with *increasing* demand.[259] Understanding that municipal water suppliers must balance solutions to short-term and long-term water demands explains why municipal suppliers may prefer seeking permanent transfers of water. Municipal suppliers often view permanent transfers as a solution to any immediate water supply concerns, but also as a means for reducing the amount of water needed for future increased demands.

All of these interests illustrate that municipal water suppliers will highly value those temporary transfers that provide the greatest reliable water supply able to meet anticipated future demands. Similarly, municipal water suppliers will value transactions, which, to the greatest extent possible, ensure that operational predictions made months and years in advance of use will actually come to pass. Certainty in the transaction and certainty in the water supply are critical to municipal and industrial water users.

One commentator has remarked that a critical aspect of making temporary transfers succeed is finding ways for water users with disparate interests to work together and create trust in finding a solution.[260] Seen in this light, the last-minute actions of the Super Ditch, to expect higher payments and change the terms of a lease with the City of Aurora, clearly illustrates a misunderstanding of what Aurora expected from such a lease. Changing the terms of the agreement in that fashion has broader implications than agricultural water users may have understood. It showed potential municipal lessors that dealing with the Super Ditch could be very uncertain, and that deals could be subject to unexpected changes. It evidences an intent to increase short-term gains over the potential of longer-term trust with a potential water lessor who values certainty.

C. MUNICIPAL WATER SUPPLIERS CANNOT RELY ON TEMPORARY TRANSFERS AS A LARGE PORTION OF ITS "FIRM YIELD" SUPPLY

As the Aurora-High Line Canal Lease illustrates, temporary transfers of water are particularly useful in providing water for drought relief and drought protection. Indeed, the very premise of the IWSA statute is to allow temporary, short-term transfers of use. Some water users, particularly non-municipal water users, believe that temporary changes of water can, however, be used as a source of "firm yield" for municipal interests: that municipalities will be able to permanently meet future demands through collections of temporary leases.[261] "Firm yield is generally defined as the amount of water that can be delivered on a reliable basis in all years and is typically determined by yield in dry years."[262]

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259. *See* COLO. WATER CONSERVATION BD., *supra* note 9, at 2-11.

260. *See* Mary Lou Smith, Vice President and Co-Founder of Aqua Engineering Inc., Conflict is not a Four-Letter Word, Presented at the South Platte Forum (October 6, 2006), *available at* http://southplatteforum.org/documents/2006/MaryLou_Smith.pdf; Winner & Smith, *supra* note 249, at 163.

261. *See* W. RES. ADVOCATES, FILLING THE GAP, COMMONSENSE SOLUTIONS FOR MEETING FRONT RANGE WATER NEEDS 36 (2011), *available at* http://westernresourceadvocates.org/water/fillingthegap/FillingTheGap.pdf; *see also* Winner & Smith, *supra* note 249 at 155-56, 160.

262. BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, WINDY GAP FIRMING PROJECT, FINAL ENVIRONMENTAL IMPACT STATEMENT 1-9 (2011), *available at*

However, reliance on temporary changes as a source of firm yield places municipal water suppliers in a difficult position.

When obtaining additional long-term water supplies, municipal reliance on firm yield is not just a desire, it is a requirement. Colorado statutes require that proposed subdivisions show "adequate evidence that a water supply that is sufficient in terms of quality, quantity, and dependability will be available to ensure an adequate supply of water for the type of subdivision proposed."[263] As an example, pursuant to the same statute, Douglas County enacted zoning regulations which require a report showing "a summary of the water rights owned and controlled by the [proposed water supplier]," the "anticipated yield of these rights in both an average and dry year," and "the amount of uncommitted firm supply the [proposed water supplier] has available for future commitment and development" in order to obtain approval of the subdivision.[264]

Thus, increased land development and its associated increased municipal water demand is tied to the ability to show long-term, firm water supply. Some environmental interests have advocated for increased reliance on temporary changes, as opposed to permanent water transfers, as a source of firm supply to offset future municipal and industrial water demands.[265] If the proposal of relying on temporary water transfers as opposed to permanent transfers were strictly applied to new developments in Douglas County, the authors believe that fewer subdivisions would be able to show a permanent firm yield. Whether intended or not, these proposals will affect future municipal development, and that aspect of the discussions should be considered.

Accordingly, municipal reliance upon firm yield from temporary sources of supply would be unwise because it presents significant concerns about the long-term reliability of those temporary sources. On the one hand, there is no reason to believe that a municipal supplier will only rely upon sources of supply it owns; the Aurora-High Line Canal Lease refutes that position. It is unclear, however, if agricultural users will be motivated to enter into sufficiently large and long-term leases to allow municipalities to rely upon leased water as a source of firm yield. Nearly every municipal water planner operates on at least a fifty-year planning horizon.[266] Yet, agricultural users appear more interested in short-term leases, on the scale of perhaps five to ten years.[267]

As an example of how an agricultural user's interest in short-term leases will defeat a municipal supplier's firm yield use of the water, one must consider municipal storage of water. As previously discussed, storage of water is a critical aspect of a municipal water system, allowing for year-round use by the municipality and protecting a municipality from drought conditions over a multi-year

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http://www.usbr.gov/gp/ecao/wgfp_feis/.

263. COLO. REV. STAT. § 30-28-133(3)(d).

264. DOUGLAS COUNTY, DOUGLAS COUNTY ZONING RESOLUTION, NO. 1805A.01.2, http://www.douglas.co.us/zoning/zoning-resolutions/section_18a_water_supply_-_overlay_district/.

265. *See, e.g.*, W. RES. ADVOCATES *supra* note 262, at 35-36.

266. *See, e.g.*, Stibrich, *supra* note 113, at 1 (Discussing a fifty-year planning horizon). Such fifty year planning periods derive in part from legal rulings in Pagosa Area Water & Sanitation Dist. v. Trout Unlimited, 219 P.3d 774, 777 (Colo. 2009) (holding that a fifty year planning period is reasonable).

267. Winner & Smith, *supra* note 249, at 157,161.

timeframe.[268] It is, however, considerably more difficult, costly, and time-consuming to build and permit storage reservoirs now than it has been in the past.[269] Municipal water suppliers will not be interested in building new reservoirs that will only see five to ten years of use.

Moreover, for a municipal supplier to rely on temporarily leased water as firm yield, it is unlikely the mechanism for such transfers could be an IWSA. Under the 2012 amendments, the SEO cannot approve any renewal application that would allow a "borrowing water right user to rely on the exercise of multiple [IWSA]s as its primary source of supply."[270] Instead, a water court decree is required.

Accordingly, while alternative transfer mechanisms may have value, and can probably be folded into a municipal water provider's collection of longer-term water supplies, agricultural users will need to demonstrate that they are willing to enter into long-term agreements before municipal suppliers will start treating leases as a source of firm yield. The authors believe this situation is analogous to the viability of wind power. Wind power can meet energy demand at certain times (when the wind blows), and therefore is a useful source of energy. However, wind power alone cannot provide reliable energy all the time; when the wind stops, so does the supply of energy. Similarly, water leases providing intermittent supplies of water are fine as an occasional source of supply, but municipalities must rely on something else the rest of the time.

D. NOT ALL IRRIGATED LAND IS CREATED EQUAL, AND SHOULD NOT BE LEASED OR PRICED EQUALLY

Assuming that every acre of irrigated land is worthy of a temporary change is flawed. Particularly in the context of IWSAs and other short-term transfers of water, water users must recognized that leasing the most junior water rights on a ditch or leasing water used on the least productive lands is a low-value transfer of water.

A lessee cannot use junior water rights if they would not be in priority at their permanent place of use.[271] This rule similarly applies to temporary changes such as IWSAs.[272] A lease of junior water rights is not usually desirable to municipalities, because they will need to exercise any temporary lease precisely when those junior rights are most likely to be legally unavailable for use. Because junior water rights may be nearly useless in dry years, parties to such transactions need to understand a dry-year lease of a senior water right may represent a lease of all of the water at that place of use, which may affect the lease price.

Similarly, transfers of water from low producing acreage are less desirable

268. *See supra* notes 255-60 and accompanying text.

269. *See* Neil Grigg, *Water Storage in Colorado: How it Developed-Toward the Future*, 30 COLO. WATER: NEWSL. OF THE WATER CTR. OF COLO. ST. U. 3, 5 (2013), *available at* http://wsnet.colostate.edu/cwis31/ColoradoWater/Images/Newsletters/2013/CW_30_6.pdf.

270. COLO. REV. STAT. § 37-92-309(6)(f)(I) (2013).

271. *See* Empire Lodge Homeowners' Ass'n v. Moyer, 39 P.3d 1139, 1149 (Colo. 2001).

272. § 37-92-309(2)(II).

to potential lessors because, compared to higher producing acreages, those areas likely produce a less transferable consumptive use.[273] As a result, municipalities will not be interested in leasing water from a ditch company if the leased water only represents a collection of the lowest production areas on a ditch system. It is reasonable, however, for municipal providers to understand that when they enter into temporary leases with agricultural water users it may be difficult for the agricultural users to only lease water used on high producing ground.[274]

Agricultural water lessors and municipal water lessees need to have realistic expectations of which irrigated lands are useful to lease. As the two examples above illustrate, neither party to a lease can expect a "free lunch." Agricultural water users must be willing to lease the valuable portions of their water, and potential lessees must be willing to pay the full costs associated with the lease.

Even when the parties are willing, however, not all irrigated lands can participate in such temporary transfers. Orchards and vineyards are the starkest example of irrigated lands that cannot participate in temporary transfers, because such crops cannot be temporarily dried-up.[275] Other situations may also prohibit leases of irrigated lands, including: prohibitively high dry-up costs, high groundwater levels, poor soil types, necessity to utilize certain crop rotation practices, weed management costs, crop replacement costs, or high dry-up labor costs.[276]

E. UNDERSTANDING WHAT A TEMPORARY LEASE IS PAYING FOR

Parties to a temporary transfer need to understand what they are buying and selling. Temporary transfers pay for temporary dry-up, which is not priced the same as an outright purchase of the water rights. As an example, parties must consider the costs of temporary dry-up in the lease price, including the costs associated with fallowing, erosion control, weed control, and ongoing irrigation infrastructure costs.

One study, surveying agricultural water users, determined that seventy-seven percent of South Platte River Basin agricultural users would expect a temporary water lease rate between $225 and $575 per acre.[277] The article concluded that such amounts fairly represented the market value of forgoing irrigation for a season.[278] But, another group (approximately ten percent of the survey participants) expected a lease payment of more than $1,000 per acre.[279] The study noted that this amount is approximately equal to market value for recent permanent water sales.[280] Thus, the study's authors concluded: "Perhaps, then,

273. *See generally* COLO. REV. STAT. § 37-92-309(1) (2013); *Limited Irrigation Management-Getting the Most Crop Per Drop*, AGRONOMY NEWS (Extension Unit, Dep't of Soil & Crop Scis., Colo. State Univ.), April 2007, *available at* http://www.extsoilcrop.colostate.edu/Newsletters/documents/2007/2007_irrigation.pdf (analyzing amount of consumptive use in relation to type of crop grown).

274. *See* Winner & Smith, *supra* note 249, at 158, 160.

275. COLO. WATER CONSERVATION BD., *supra* note 248, at 3-13, 3-15.

276. *Id.*

277. Pritchett, et al., *supra* note 5, at 3-4.

278. *Id.*

279. *Id.*

280. *Id.*

these farmers are calculating a market value for their water rather than a minimum payment to forgo irrigation."[281] A potential lessee will not lease a water right for the same price the lessee would pay to buy the water right.

F. INFRASTRUCTURE, INFRASTRUCTURE, INFRASTRUCTURE

Municipalities need infrastructure to transport the leased water to its temporarily changed place of use. Although this issue is consistently discussed as an impediment to temporary transfers,[282] the authors of this article believe that infrastructure development is a significantly underappreciated impediment to widespread utilization of temporary changes.

By way of example, the City of Aurora recently constructed its Prairie Waters Project, at a price tag of over $600 million.[283] Aurora largely funded the project through bonds, which will continue to require payment for many years to come.[284] The project has an initial capacity of ten thousand acre-feet per year,[285] and an anticipated capacity of forty-six thousand acre-feet per year.[286] Much of the water used in the system is the recapture and conveyance of Aurora's existing fully consumable water rights.[287] The system conveys water over thirty-four miles, and includes a state-of-the-art water treatment system.[288]

The large cost of the Prairie Waters Project demonstrates why many municipalities may feel reluctant to build costly infrastructure for a temporary source of supply. The Prairie Waters Project allowed Aurora to recapture and treat water the city already owned and, comparatively speaking, only transports the water a relatively short distance.[289] It should be no surprise that a municipal water supplier might balk at permanent infrastructure costs of these magnitudes, which would only provide temporary access to water owned by another entity and leave that same expensive infrastructure unused for long periods of time.

The authors do not see any good resolutions to this issue. It is likely that short-term leases will be limited in geographical scope or limited to a small number of participants who are able to integrate certain leased water rights into their infrastructure at low costs. In the context of the Aurora High Line Canal Lease, Aurora was able to effectuate a short-term lease through its existing water conveyance structures.[290] Many of Aurora's neighboring municipal water suppli-

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281. *Id.*

282. COLO. WATER CONSERVATION BD., *supra* note 248, at 3-13, 3-15; COLO. WATER CONSERVATION BD., *supra* note 232, at 5-4; W. GOVERNORS' ASSOC. & W. STATES WATER COUNCIL, WATER TRANSFERS IN THE WEST 15, 64 (Dec. 2012), *available at* http://www.westgov.org/reports/cat_view/95-reports/263-2012.

283. AURORA WATER, PRAIRIE WATERS PROJECT, https://www.auroragov.org/cs/groups/public/documents/document/002347.pdf (last visited Feb. 21, 2014).

284. Sara Castellanos, *Bond Rating Upgraded on Aurora Water Debt*, AURORA SENTINEL, July 19, 2012, http://www.aurorasentinel.com/news/bond-rating-upgraded-on-aurora-water-debt/.

285. AURORA WATER, *supra* note 283.

286. *Aurora - Prairie Waters Project*, DEERE & AULT CONSULTANTS, INC., http://deereault.com/water-resources/aurora-pwp.php (last visited Feb. 1, 2014).

287. AURORA WATER, *supra* note 283.

288. *Id.*

289. *Id.*

290. *See* AURORA WATER, WATER SUPPLY FACT BOOK 2, 14-15 (2010-2011), *available at* https://www.auroragov.org/cs/groups/public/documents/document/002337.pdf.

ers, without that existing infrastructure, would have been unable to even consider such a lease. Some agricultural water users will find it much easier than others to temporarily transfer water, based solely upon their proximity to existing municipal water infrastructure.[291]

All other circumstances being equal, longer-term temporary transfer agreements have a better chance of convincing municipal suppliers to invest in infrastructure, as the cost of such investments will produce a greater water supply. Thus, isolated agricultural water lessors should expect longer-term agreements than agricultural producers located near municipalities. Moreover, if infrastructure costs are sufficiently large, municipalities will begin to favor alternative transfer mechanisms with greater certainty of long-term access to water, such as "Purchase and Leaseback." Purchase and Leaseback occurs when a municipality buys and owns the water rights, but temporarily leases the water back to agricultural users during wet and average years.[292]

G. WATER COURT VERSUS SEO APPROVAL

The discussion of this topic could be an article unto itself. Nonetheless, as Colorado has established the water courts as the venue and authority for deciding water matters,[293] any transfer of authority to the SEO over certain water matters is likely to be contentious. The authors do not believe that the SEO should administratively approve every temporary transfer; alternative transfer methods that seek to dry-up certain amounts of acreage permanently should obtain water court approval. The authors also believe, however, that the SEO can effectively administer temporary changes, and that such temporary transfers allow flexible and time-sensitive management of a dynamic resource. The key, of course, is gaining consensus among Colorado water users as to which changes are "temporary." On that issue, the devil is in the details.

VI. CONCLUSION

As Colorado continues to explore the role of temporary changes and alternative transfers of water, it will have many opportunities to more effectively manage the State's limited water resources. Temporary transfers, like the existing Interruptible Water Supply Agreements, are a necessary advancement to the modern use and administration of water. Legally recognizing these kinds of plans will allow water users to collectively share a limited and dynamic resource.

Colorado should embrace these new opportunities and utilize the new legal frameworks when such temporary transfers are needed. The experiences of the City of Aurora and the High Line Canal indicate that temporary transfers of water will be a successful tool for both municipal and agricultural water users. However, Colorado water users should also understand the limitations of temporary changes, and not view them as a silver-bullet-solution to Colorado's projected water deficits. Nuanced and flexible adoption of temporary transfers will

291. *See* DINATALE WATER CONSULTANTS, INC., WATER PARTNERSHIPS: AN EVALUATION OF ALTERNATIVE AGRICULTURAL WATER TRANSFER METHODS IN THE SOUTH PLATTE BASIN 17 (March, 2012), *available at* http://dinatalewater.com/pdf/water_partnerships.pdf.

292. COLO. WATER CONSERVATION BD., *supra* note 10, at 10.

293. COLO. REV. STAT. § 37-92-203(1) (2013).

be the key to their success.

For instance, such temporary transfers are good at resolving water demands associated with drought protection and drought recovery, but temporary transfers will not be a useful source of water that municipalities can rely upon for long-term firm yield. Much like the role of wind power in the context of energy supply, temporary transfers will work well as a part of a municipal water supply, but will not provide enough water at the right times to become a reliable base supply.

While the current IWSA statute facilitates such temporary transfers, it has yet to be widely utilized in Colorado. Recent amendments to that statute are good improvements, allowing, for example, renewals of IWSA plans.

Impediments continue, however, to block widespread utilization of temporary changes. From an agricultural water user's perspective, uncertainty regarding the outcome of a historic consumptive use analysis appears to discourage interest in temporary transfers. From a municipal water supplier's perspective, the uncertainty of whether such temporary supply will be available in twenty to thirty years, even on an occasional basis, appears to discourage interest in temporary transfers. On those issues, Colorado should expect further proposed legislation, as some water users will perceive legislative action as the best means to a resolution. The authors caution that any legislative changes on these issues should not solve a problem for one water user at the expense of other water users.

Other impediments – like the lack of necessary infrastructure, or the inability to lease water associated with junior rights or low producing irrigated lands – will probably hamper, or even preclude, the ability of certain water users to temporarily lease their water for new uses.

What may better serve some water users is establishing good relationships between municipal and agricultural water users. Such relationships will help both parties determine the role of a proposed temporary transfer by understanding what water can be leased, what water cannot be leased, what lands can be dried-up, what the resulting transferable yield will be, and what the temporary dry-up of land is monetarily worth.

In consideration of the opportunities, and despite the impediments, it is likely that Colorado will see an expansion of alternative transfer mechanisms in the coming years. Alternative transfer mechanisms, however, will not solve every water demand issue in Colorado. Colorado should recognize the proper role of alternative transfer mechanisms, and tailor the legal frameworks governing those transfers accordingly. Doing so will result in better water management for the state, reductions in the magnitude of projected water supply deficits, and continued respect for Colorado's unique water rights system and its individual water users.

STRENGTHENING BINATIONAL MANAGEMENT OF THE TIJUANA RIVER

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I. INTRODUCTION

The Tijuana River is perhaps the best known of the various unapportioned rivers and streams crossing the U.S.-Mexico border. A part of the intensely-urbanized San Diego-Tijuana metropolitan region of the border, the river is formed of the confluence of Cottonwood Creek, Pine Creek, and Campo Creek in the United States that drain to Mexico's Rio Alamar, the Rio de las Palmas, and its feeder tributaries in Mexico.[1] It has a watershed of 1,750 square

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1. JOAQUÍN BUSTAMANTE REDONDO, LA COMISIÓN IINTERNACIONAL DE LÍMITES Y AGUAS ENTRE MÉXICO Y LOS ESTADOS UNIDOS, 417 (1999); *Tijuana River Watershed*, SAN DIEGO TRANS. & STORM WATER DEPT., http://www.sandiego.gov/thinkblue/pdf/tjwatershed.pdf

miles draining on the western slope of the California coastal range, with 73 percent of this watershed located in Mexico.[2] Roughly 62 percent of the capturable runoff is located in Mexico and the remaining 38 percent is situated in the United States.[3] The river and its watershed today provide vital economic and ecosystem services affecting two of the most dynamic metropolitan regions (and their respective suburbs) on the west coast of North America: Tijuana and San Diego, with a combined metropolitan population of nearly 2.7 million people in 2010.[4]

The river's surface waters are critical for the water supplies of both conurbations, both historically and contemporarily. Barrett Dam and Morena Dam capture its runoff north of the border and the Abelardo Rodriguez Dam impounds its water on Tijuana's outskirt.[5] Its associated subsurface water supplies are indispensable for various ranches, farms, and small communities on the western slope of the coastal range.[6] Flooding, contamination, erosion, and sedimentation within its associated streams and arroyos potentially affect both countries, not just one.

The sister city interdependencies the Tijuana River establishes certainly rival those of any other river on the U.S.-Mexican border. Knowing this, it is remarkable that the river still remains unapportioned and the subject of just eleven technical binational agreements at the federal level dealing with flood control and sanitation, ten of these subsidiary to the landmark 1944 U.S.-Mexico Water Treaty (the "1944 Water Treaty")[7] and one associated with the 1983 La Paz Agreement[8]This is all the more peculiar considering that Article 16 of

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(last visited Mar. 10, 2014).

2. *See Tijuana Watershed*, PROJECT CLEAN WATER, http://www.projectcleanwater.org/html/ws_tijuana.html (last visited Feb. 20, 2014).

3. ERNEST ENRIQUEZ COYRO, EL TRATADO ENTRE MÉXICO Y LOS ESTADOS UNIDOS DE AMÉRICA SOBRE RÍOS INTERNACIONALES: UNA LUCHA NACIONAL DE NOVENTA AÑOS 743 (1976).

4. *Economic Development: Population*, SANDIEGO.GOV (Mar. 1, 2011), http://www.sandiego.gov/economic-development/sandiego/population.shtml; *Tijuana*, CITYPOPULATION.DE, http://www.citypopulation.de/php/mexico-bajacalifornia.php?cityid=020040001 (last visited Feb. 21, 2014).

5. *See* Peter Smith, *The Watershed Economy: Legal Challenges Facing the Tijuana River*, 11 U. DENV. WATER L. REV. 337, 341 (2008); *Water: Barrett Reservoir*, SANDIEGO.GOV, http://www.sandiego.gov/water/recreation/reservoirs/barrett/index.shtml (last visited Feb. 21, 2014); *Water: Morena Reservoir*, SANDIEGO.GOV, http://www.sandiego.gov/water/recreation/reservoirs/morena.shtml (last visited Feb. 21, 2014).

6. *See* Smith, *supra* note 5, at 350-51.

7. Treaty for the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, U.S.-Mex., Feb. 3, 1944, 59 Stat. 1219 [hereinafter 1944 Water Treaty], *available at* http://www.ibwc.gov/Files/1944Treaty.pdf.

8. Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area, U.S.-Mex., Aug. 14, 1983, 35 U.S.T. 2916 [hereinafter La Paz Agreement].

9. *See* Smith, *supra* note 5 at 357-59 (discussing six of the aforementioned agreements); *see also* INT'L BOUNDARY & WATER COMM'N, MINUTE 296: DISTRIBUTION OF CONSTRUCTION, OPERATION AND MAINTENANCE COSTS FOR THE INERNATIONAL WASTEWATER TREATMENT PLANT CONSTRUCTED UNDER THE AGREEMENTS IN COMMISSION MINUTE NO. 228 FOR THE SOLUTION OF THE BORDER SANITATION PROBLEM AT SAN DIEGO, CALIFORNIA/TIJUANA, BAJA CALIFORNIA (APR. 16, 1997), HTTP://WWW.IBWC.GOV/FILES/MINUTES/MIN296.PDF; INT'L BOUNDARY & WATER COMM'N, MINUTE 298: RECOMMENDATIONS FOR THE CONSTRUCTION OF WORKS PARALLEL TO THE CITY OF TIJUANA, B.C. WASTEWATER PUMPING AND DISPOSAL SYSTEM AND REHABILITATION OF THE SAN ANTONIO DE LOS BUENOS TREATMENT PLANT (Dec. 2, 1997), http://www.ibwc.gov/Files/Minutes/Min298.pdf; and INT'L BOUNDARY & WATER

the 1944 Water Treaty recognized the need to allocate and manage the river and articulated a vision for "Recommendations for the equitable distribution between the two countries of the waters of the Tijuana River system,"[10] which remains unrealized today. While much is written on basin water management, and though various binational initiatives have addressed aspects of the problem, the need to strengthen treaty-based binational cooperation in managing the river remains.[11]

This article argues the need for a more comprehensive binational agreement on managing the river and its watercourse. It reviews the management challenges on the Tijuana River and describes existing international instruments and initiatives relevant to strengthening binational cooperation in managing the river and its watershed. We begin with an overview of binational water management as it applies to the Tijuana River. We then review the water management challenges in the Tijuana River basin. Our analysis proceeds by pointing to potential applications of existing bilateral treaties and agreements to Tijuana River management. We follow this with a review of the various water management initiatives related to the Tijuana River the United States and Mexico have undertaken since 1993. We conclude by arguing that a new comprehensive binational agreement is needed to manage the various watershed concerns within the Tijuana River Watershed ("TRW") and suggest how both countries might craft such an agreement to fulfill the unrealized promise of the 1944 Water Treaty and establish a framework for cooperation that supports the sustainable management of the watershed for future generations.

II. BINATIONAL COOPERATION AND THE TIJUANA RIVER

International law and policy governing internationally-shared freshwater resources place a premium on states' ability to conclude formal government-to-government agreements concerning the management of these resources. While formal agreements cannot in themselves assure cooperative relations among coriparians in governing shared resources, the institutionalization of cooperation in international water management generally requires some type of formal agreement or set of agreements characterizing the resource, the desirability of cooperation, the aims and purposes of the agreement, the mechanisms intended to achieve the agreed upon objectives, and measures to insure the parties' compliance with whatever agreements the parties strike.[12]

By this measure, the management of shared resources along the U.S.-Mexico border is highly institutionalized. The water treaties between Mexico and

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COMM'N, MINUTE 311: RECOMMENDATIONS FOR SECONDARY TREATMENT IN MEXICO OF THE SEWAGE EMANATING FROM THE TIJUANA RIVER AREA IN BAJA CALIFORNIA, MEXICO (Feb. 20, 2004) [hereinafter MINUTE 311], http://www.ibwc.gov/Files/Minutes/Min311.pdf. This count does not include binational agreements relating to emergency delivery of Colorado River Water to Tijuana, water that is stored in Mexico's Rodriguez and El Carrizo dams in the Tijuana River system.

10. 1944 Water Treaty, *supra* note 7, at art. 16.

11. *See generally* INST. FOR REG'L STUDIES OF THE CALIFORNIAS, A BINATIONAL VISION FOR THE TIJUANA WATERSHED (2005), *available at* http://irsc.sdsu.edu/docs/pubs/Tijuana_River_Watershed_Binational_Vision.pdf.

12. *See* ARIEL DINAR ET AL., BRIDGES OVER WATER: UNDERSTANDING TRANSBOUNDARY WATER CONFLICT, NEGOTIATION AND COOPERATION 56-57 (2007).

the United States are among the most enduring international watercourse treaties in the international community today.[13] Together with the 1848 Treaty of Guadalupe Hidalgo, which defines the sovereign territorial limit of the two countries,[14] many regard these treaties as diplomatic pillars of the U.S.-Mexico relationship.[15] Today, these agreements, which include various boundary conventions applicable to their riparian boundaries and two water treaties, govern the allocation and management of the two major transboundary river basins, the Colorado River and the Rio Grande River, and most of their tributaries.Despite the broad geographic scope and purpose of these treaties, however, they do not apply to a small number of streams that cross the border or, with slight exception, to shared groundwater, or at the present time to ecological preservation of riparian resources, though the countries have made some progress recently in this regard. The U.S.-Mexico water treaty regime certainly has its limitations.

This is relevant to understanding the situation on the Tijuana River. What is evident in the historical record and reflected in the text of the 1944 Water Treaty's Article 16 is that at the time of ratification the two governments envisioned the need for such an agreement in view of then-existing demand on the basin's known water supply and anticipated future growth.[16] The parties perceived the value of extending the administrative and diplomatic authority of the newly established International Boundary and Water Commission ("IBWC") to binational negotiations concerning the river and, by extension, incorporating the river geographically under the sanitary authority of the IBWC.[17] There is little doubt that the treaty drafters believed the countries should draw the Tijuana River more thoroughly into the treaty regime, something they could accomplish by extending the authority of Article 16 and using the diplomatic tools entrusted to the IBWC.

What we have in the 1944 Water Treaty bearing on the Tijuana River is something akin to a framework agreement,[18] an agreement to agree, which provides an administrative home, some procedures, and some goals that the drafters thought to be relevant at the time to more fully incorporating the Tijuana River into the treaty regime. In the absence of a more detailed historical investigation, we can only speculate as to why the governments failed to engage the allocation mandate.[19] Yet, we can fairly assume that the drafters envisioned

13. For more information on transboundary watercourse treaties see Program in Water Conflict Management and Transformation, *International Freshwater Treaties Database*, OREGON STATE UNIVERSITY, http://www.transboundarywaters.orst.edu/database/interfreshtreatdata.html (last visited Feb. 25, 2014).

14. Treaty of Peace, Friendship, Limits, and Settlement with the Republic of Mexico, U.S.-Mex., art. 5, Feb. 2, 1848, 9 Stat. 922 [hereinafter Treaty of Guadalupe Hidalgo].

15. *See, e.g.* Robert H. McBride, *The United States and Mexico: The Shape of the Relationship, in* Mexico and The United States 1, 8 (Robert H. McBride, ed., 1981); s*ee Rio Grande Water for Peace*, ENGINEERING NEWS-RECORD, July 27, 1967, at 33, 35.

16. 1944 Water Treaty, *supra* note 7, at art. 16; COYRO, *supra* note 3, at 887; NORRIS HUNDLEY, JR., DIVIDING THE WATERS 133-34 (1966); MARCO ANTONIO SAMANIEGO LÓPEZ, RIOS INTERACIONALES ENTRE MEXICO Y ESTADOS UNIDOS, LOS TRATADOS DE 1906 Y 1944, 361 (2006).

17. *See* 1944 Water Treaty, *supra* note 7, at arts. 3, 16.

18. *See generally* DINAR ET AL., *supra* note 12, at 160 (defining "framework agreements" and providing examples of such agreements concerning shared freshwater resources).

19. The record does show that the IBWC discussed the problem of allocation on various occasions in the late 1940's, 1950's, and 1960's. *See, e.g.*, JOSEPH F. FRIEDKIN, PROPOSED

strengthening the treaty's application to the Tijuana River, that many of the circumstances that contributed to that view endure, that other compelling reasons for an elaboration of the Treaty's application to the Tijuana River have since arisen, and that achieving such an agreement would strengthen the legacy of bilateral cooperation on shared water resources along the border with potential benefits to the United States and Mexico and the sustainable development of the Tijuana-San Diego region.

III. THE CASE FOR STRENGTHENING BINATIONAL COOPERATION ON THE TIJUANA RIVER

The Tijuana River system presents multiple challenges ranging from water supply and allocation, sanitation and water quality, ecological needs, flooding, stormwater, and sediment management - most of which require binational cooperation for effective government management. In addition to these problems, there is also the diplomatic and logistical problem of binational engagement for watershed management on a transboundary basis. A brief review of these issues is necessary to advance the case for strengthening binational cooperation in managing the Tijuana River watershed.

A. WATER SUPPLY AND ALLOCATION

The Tijuana River watershed is both a conduit and a repository of vital surface and underground waters serving communities on each side of the border. Precipitation within the watershed is highly variable and concentrated between November and April.[20] Mexico's National Water Commission has estimated the Tijuana River Watershed output at 54,841 acre-feet annually.[21] Of the two adjoining urban areas, the Mexican side may be slightly more dependent on the watershed's resources for its urban water supply than San Diego (city and county) if one considers San Diego's groundwater abstraction from well fields along the Tecate and Alamar Rivers and the Rio de las Palmas. Only 21 percent percent of San Diego's surface water storage capacity is located in the Tijuana River basin, compared with 100 percent of Tijuana's surface storage capacity, and surface water sources from all San Diego watersheds constitute just 12 percent of San Diego's water supply, diminishing the impact of Tijuana River surface water on its overall water budget.[22] San Diego also takes a small amount of groundwater from the basin.[23] Across the border, surface runoff and

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INTERNATIONAL FLOOD CONTROL PROJECT, TIJUANA RIVER BASIN IN CALIFORNIA AND BAJA CALIFORNIA 7 (1965). Its 1965 report on the Tijuana River flood control project described the issues of equitable distribution and water development as "under study" but noted "the need for and feasibility of action on them may not materialize, at least not for some years." *Id.* Pete Silva, former U.S.-IBWC field director for the San Diego Region, has said he believed the existence of at least five known geologic faults affecting potential dam-sites caused IBWC to retreat from further effort to impound Cottonwood Creek. Conversation between Steve Mumme and Pete Silva, Tijuana River Workshop, Tijuana, Mex. (May 15, 2013).

20. INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 37; Smith, *supra* note 5, at 339.

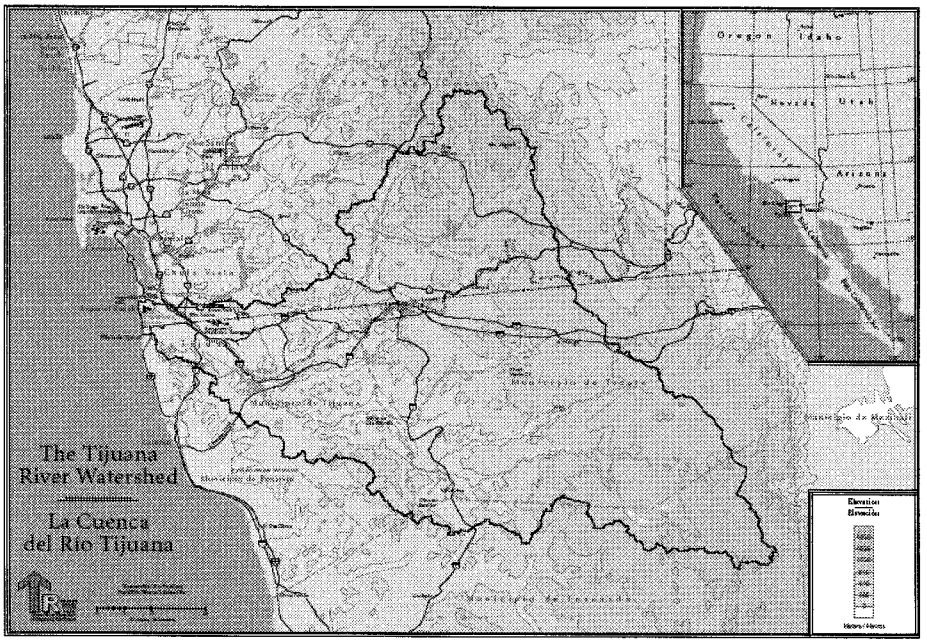
21. INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 37.

22. CITY OF SAN DIEGO, 2010 URBAN WATER MANAGEMENT PLAN, § 2.4.2 (2010), *available at* http://www.sandiego.gov/water/pdf/110519uwmp.pdf (recording the total reservoir storage in the Barrett and Morena dams as 85,500 acre-feet).

23. *See id.* § 4.3.

groundwater contribute 5 percent of Tijuana's water supply.[24] While the Tijuana River today plays a relatively small role in the region's water supply, the general scarcity of water and rising consumptive demand on both sides of the border accentuate its importance.[25] Even when one takes into account the watershed's highly variable runoff and the possibility of water falling below existing dams,[26] the fact that the United States and Mexico have never apportioned or cooperatively managed these waters as a consumptive resource is puzzling, particularly at a time of rising interest in the Tijuana River's ecosystem services.[27]

Figure 1. The Tijuana River Watershed



Source: Institute for Regional Studies of the Californias, *supra* note 11, at 12.

Historically, water authorities in each nation sought to secure their water stock from more reliable sources, particularly the Colorado River and California's State Water Project.[28] With aggregate water demand chronically challenging supply, both countries pursued additional water transfers, conservation, groundwater development, and other alternative sources.[29] As each country has

24. INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 42.

25. PAUL GANSTER, SUSTAINABLE DEVELOPMENT IN SAN DIEGO AND TIJUANA: THE VIEW FROM SAN DIEGO (Roberto A. Sanchez, and Paul Ganster, eds., 1999).

26. Smith, *supra* note 5, at 339.

27. *See generally* Mark Spalding, *Tijuana River Watershed Binational Protection Research Report on Establishment of Fundamental Concepts for the Binational Protection of the Tijuana River Watershed as Related to Law, Governance, Institutions, and Politics*, 1-3, 18 (prepared for the Fundación La Puerta) http://trw.sdsu.edu/English/Projects/Docs/Spalding2.pdf (last visited Feb. 28, 2014).

28. *See* INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 4; David H. Getches, *Water Management in the United States and the Fate of the Colorado River Delta in Mexico*, 11 U.S.-MEX. L.J. 107, 107-08 (2003).

29. *See generally* Jeffrey Jacobs, *The Sustainability of Water Resources in the Colorado*

gone about crafting its own water supply solutions, local attention to sharing Tijuana River water has receded in regional water policy.[30] The 2009 update of California's state water plan only references the Tijuana River with respect to flooding.[31]

The City of San Diego's 2010 water plan, for example, scarcely mentions the Tijuana River, noting the attractiveness of potential groundwater storage in the Tijuana River estuary north of the international boundary but otherwise emphasizing San Diego's access to imported water supplies and making no reference to Mexico or sharing Tijuana River water.[32] In a similar way, Baja California's State Water Program for 2008-2013 only references the Tijuana River in regard to contamination problems provoked by reclaimed waters and the projects to treat them.[33] A comprehensive assessment for the TRW in 2005 by the Binational Watershed Advisory Council ("BWAC") also neglects any need to allocate the river's resources, fails to mention Article 16, and provides just a brief reference to the IBWC's role in regional water policy.[34] Interestingly, this report barely mentions drought concerns and climate change, which stress the region's reliance on out-of-basin water sources - namely California's State Water Project and the U.S. and Mexican Colorado River aqueducts.[35] The report does point to a growing demand for water and the long-term need for water supply augmentation, conservation measures, water reuse, groundwater storage, and desalination as a hedge against drought.[36] In sum, it is safe to say that allocating the Tijuana River's surface and subsurface resources is not presently on the working agendas of either country.

River Basin, THE BRIDGE 6, 10-11 (Winter 2011).

30. *See* Smith, *supra* note 5, at 361-63.

31. CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2009: SOUTH COAST INTEGRATED WATER MANAGEMENT SC-39 (Bulletin. No. 160-09, Volume 3 Regional Reports 2009), *available at* http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_southcoast_cwp2009.pdf.

32. CITY OF SAN DIEGO, *supra* note 22, §§ 4-4.1, 4.3.

33. PROGRAMA ESTATAL HÍDRICO ESTADO DE BAJA CALIFORNIA 69 (2008) *available at* http://www.ceabc.gob.mx/Documents/PEH20082013.pdf.

34. *See* INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 3, 17, 176, 180.

35. *See id., e.g.* at 42, 43, 124. It bears mentioning that Mexico, since 1972, has also made occasional use of California's Colorado River Aqueduct to wheel water to Tijuana on an emergency basis, making use of San Diego Water Authority's aqueduct link to the Metropolitan Water District of Southern California. *See, e.g.*, INT'L BOUNDARY & WATER COMM'N, MINUTE 240: EMERGENCY DELIVERIES OF COLORADO RIVER WATERS FOR USE IN TIJUANA, 1 (June 3, 1972), http://www.ibwc.gov/Files/Minutes/Min240.pdf. Since the original delivery in August 1972, Mexico has to date signed thirteen IBWC Minutes for emergency water deliveries to Tijuana. INT'L BOUNDARY & WATER COMM'N, *Minutes Between the United States and Mexican Sections of the IBWC*, http://www.ibwc.gov/Treaties_Minutes/Minutes.html (last visited Feb. 20, 2014) (showing that Minutes 243, 245, 252, 256, 259, 260, 263, 266, 267, 280, 287, 310, and 314 concern emergency water delivery to Tijuana). Mexico's need for emergency deliveries of Colorado water abated with completion of the first Mexican Colorado River aqueduct in 1981, but new needs arose in the 1990's as Tijuana's population growth combined with periodic droughts to stress the city's water supply. *See* Michael J. Cohen, *Municipal Deliveries of Colorado River Basin Water*, PAC. INST., 33-34 (June 2011), *available at* http://www.pacinst.org/reports/co_river_municipal_deliveries/crb_water.pdf.

36. INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 55-57, 160-61, 168.

B. WATER QUALITY AND SANITATION

Water quality is another challenge with ramifications for human health and the health of ecosystems. The California State Water Resources Control Board classifies the TRW as a Category I impaired watershed based on a wide range of point and non-point source pollution threats.[37] Agriculture in San Diego County is a major source of non-point source pollution north of the border and an enduring problem, but urbanization poses the greater pollution threat.[38] Rapid urbanization, particularly on the Mexican side of the border, contributes to soil erosion and particulates as dwellings are constructed on the banks of deep canyons within the watershed.[39] The dramatic growth of both the maquiladora (assembly for export) industry and human settlements in Tijuana and San Diego County in the past three decades has amplified the threat of surface and ground water pollution from untreated wastewater, uncontained industrial waste, and public refuse.[40]

The threat of uncollected sewage and spillage across the boundary motivated the binational construction of the San Diego International Wastewater Treatment Plant, whose origins date as far back as the 1960's.[41] This controversial facility,[42] which collects sewage from Tijuana's sewage grid, continues to be inadequate for local needs and has recently spawned another binational water treatment project on the Rio Alamar.[43] Part of the problem is concentrated in the heavily populated lower reaches of the watershed on the Mexican side of the border where human settlements are constructed on the steep banks of tributaries like Los Laureles Canyon and Smugglers Gulch. Much of this development is situated off Tijuana's present sewerage grid, though the degree of the

37. PROJECT CLEAN WATER, *supra* note 2.

38. Diane DeJong et al., *The Use of a Non-Point Source Pollution Self-Assessment for Greenhouse and Nursery Operators in California*, J. OF EXTENSION, Feb. 2009, at 1, 2, *available at* www.joe.org/joe/2009feburaru/a8.php.

39. Lawrence A. Herzog, *Urban Planning and Sustainability in the Transfrontier Metropolis: The Tijuana-San Diego Region*, *in* SUSTAINABLE DEVELOPMENT IN SAN DIEGO-TIJUANA 1, 8 (Mark J. Spalding, ed., 1999).

40. ALBERTO POMBO, TIJUANA: AGUA Y SALUD AMBIENTAL 59 (2004); EARL SHORRIS, THE LIFE AND TIME OF MEXICO 521 (2004).

41. INT'L BOUNDARY & WATER COMM'N, MINUTE 283: CONCEPTUAL PLAN FOR THE INTERNATIONAL SOLUTION TO THE BORDER SANITATION PROBLEM AT SAN DIEGO, CALIFORNIA AND TIJUANA, BAJA CALIFORNIA, 1-2, 4-5 (July 2, 1990) [hereinafter MINUTE 283], http://www.ibwc.gov/Files/Minutes/Minute283.pdf; INT'L BOUNDARY & WATER COMM'N, MINUTE 270: RECOMMENDATIONS FOR THE FIRST STAGE TREATMENT AND DISPOSAL FACILITIES FOR THE SOLUTION OF THE BORDER SANITATION PROBLEM AT SAN DIEGO, CALIFORNIA-TIJUANA, BAJA CALIFORNIA, 2-3 (Apr. 30, 1985) [hereinafter MINUTE 270], http://www.ibwc.gov/Files/Minutes/Min270.pdf; INT'L BOUNDARY & WATER COMM'N, MINUTE NO. 222: EMERGENCY CONNECTION OF THE SEWAGE SYSTEM OF THE CITY OF TIJUANA, BAJA CALIFORNIA TO THE METROPOLITAN SEWAGE SYSTEM OF THE CITY OF SAN DIEGO, CALIFORNIA, 1-2 (Nov. 30, 1965), http://www.ibwc.gov/Files/Minutes/Min222.pdf.

42. *See* Lori Saldana, *From Litigation to Legislation: Challenges to Binational Water Infrastructure Development in the San Diego-Tijuana Bioregion*, 12 J. ENV'T & DEV. 430, 435, 437-48 (2003).

43. MINUTE 311, *supra* note 9, at 1-2; Press Release, Int'l Boundary & Water Comm'n, Report Comparing the Cost and Timelines for Construction of Secondary Wastewater Treatment Facilities in the United States and in Mexico for the Treatment of Tijuana Sewage (Apr. 25, 2008), *available at* (http://isites.harvard.edu/fs/docs/icb.topic447249.files/IBWC_TJsewage_rprt_Prob%205.pdf).

impact is not well understood.[44] Black water contamination and other waterborne refuse not only presents a surface health hazard and groundwater threat but also drains to the Tijuana River Estuary on the United States' side of the boundary line, threatening fauna and flora in the Tijuana River National Estuarine Research Reserve.[45]

C. BIODIVERSITY AND ECOSYSTEM SERVICES

Both water availability and water quality impact biodiversity in the watershed.[46] The TRW plays a vital ecosystem services role, functioning as a link on the Pacific Flyway and sustaining an extraordinary mix of fauna and flora.[47] The Tijuana River Estuary has been the focus of long-term conservation efforts and is today one of the last remaining relatively pristine estuaries on the southern California coast.[48] The Tijuana River National Estuarine Research Reserve ("TRNERR"), with its associated wetlands, not only protects various endangered and threatened species but is also the focus of considerable governmental investment (estimated at nearly half a billion dollars over the past half century) aimed at sustaining this unique resource.[49] Unregulated informal settlements along the canyons that drain across the boundary to the wetland, as well as recent border security development, have worsened problems of erosion and sedimentation in the estuary and seriously threaten these wetlands.[50]

The Tijuana River Estuary may be the best-known biodiversity problem in the watershed, but one may find many other biodiversity concerns related to urban and industrial development in the basin. The Alamar River/Cottonwood Creek sub-basin, which runs from the international boundary near Tecate to Tijuana is the best-preserved riparian corridor in the Tijuana Region and provides habitat for numerous species of birds, wildlife, and vegetation.[51] Presently, however, encroaching urbanization and land development threaten this biologically rich area.[52] Over much citizen protest, Mexico's National Water Commission is now proceeding with plans to channelize the lower Rio Alamar

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44. POMBO, *supra* note 40; INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 43.

45. TIJUANA RIVER NAT'L ESTUARINE RESEARCH RESERVE, COMPREHENSIVE MANAGEMENT PLAN, 93 (2010), *available at* http://www.nerrs.noaa.gov/Doc/PDF/Reserve/TJR_MgmtPlan.pdf; s*ee also Tijuana River Valley Recover* [sic] *Team Workshop-Meeting Notes,* BORDER SEWAGE COALITION (June 26, 2009), http://bordersewagecoalition.blogspot.com/2009/07/tijuana-river-valley-recover-team.html.

46. INST. FOR THE REG'L STUDIES OF THE CALIFORNIAS, THE ALAMAR RIVER CORRIDOR: AN URBAN PARK OASIS IN TIJUANA, BAJA CALIFORNIA 6 (Suzanne Michael ed.) (2001) [hereinafter ALAMAR RIVER CORRIDOR].

47. *Id.* at 4, 33; s*ee also* Spalding, *supra* note 27, at 1.

48. TIJUANA RIVER NAT'L ESTUARINE RESEARCH RESERVE, *supra* note 45, at 1, 12, 15.

49. OFFICE OF OCEAN AND COASTAL RES. MGMT., NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, FINAL EVALUATION FINDINGS: TIJUANA RIVER NATIONAL ESTUARINE RESEARCH RESERVE CALIFORNIA 1, 4, 23, 26-27 (2010), *available at* http://coastalmanagement.noaa.gov/mystate/docs/trnerr2010.pdf; Greg Cox, *Acting Responsibly on Border Fence,* UNION TRIBUNE SAN DIEGO (Mar. 1, 2005), http://www.utsandiego.com/uniontrib/20050301/news_lz1e1cox.html (last visited Mar. 10, 2014).

50. *See* TIJUANA RIVER NAT'L ESTUARINE RESEARCH RESERVE, *supra* note 45, at 89, 95, 101-02.

51. *See* ALAMAR RIVER CORRIDOR, *supra* note 46, at 4, 9, 29, 33.

52. SUZANNE MICHAEL & CARLOS GRAIZBORD, INST. FOR REG'L STUDIES OF THE

through a highly urbanized part of the Tijuana municipality, thereby eliminating several miles of scarce riparian vegetation.[53]

D. FLOODING, STORMWATER, AND SEDIMENTATION

Flooding is another longstanding binational concern. The coastal range, with its steep and rocky slopes and highly variable precipitation, is historically associated with rapid deposition of rainwater, which, when coupled with limited containment, means flooding is an ever-present threat.[54] Flood control and water supply justified early reclamation efforts on the Cottonwood Creek/Rio Alamar and the Rio de las Palmas tributaries.[55] Today, the United States and Mexico impound 78 percent of the Tijuana River's watercourse.[56] Catastrophic damage from floods, of which the notorious winter 1980 Zona del Rio flood is indicative,[57] was the official justification for channelizing and lining the Tijuana River in its international stretch below Abelardo Rodriguez Dam in the 1970's.[58] Flooding remains a serious problem on both the Tijuana River mainstream and along its tributaries below the Barrett and Moreno dams in the United States and below the Mexican dams, El Carrizo on the Rio Tecate and Rodriguez on the Rio de la Palmas.[59]

Even minor flooding contributes to stormwater management challenges in the watershed, some of which are binational in nature.[60] Stormwater contributes to erosion, deposition of debris, blockages and deterioration of culverts and pipage, and other stresses and threats to infrastructure within the watershed.[61] Over the past two decades, both countries have recognized the need to cooperatively manage stormwater events, reduce hazards, and remediate damages, particularly those from the watershed's lower canyons draining to the United

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CALIFORNIAS, URBAN RIVERS IN TECATE AND TIJUANA: STRATEGIES FOR SUSTAINABLE CITIES 21 (2002), *available at* http://irsc.sdsu.edu/docs/pubs/URIV_ENG.PDF.

53. Dave Good, *Showdown on the Rio Alamar*, SAN DIEGO READER (Sept. 5, 2012), http://www.sandiegoreader.com/news/2012/sep/05/cover-showdown-rio-alamar (last visited Mar. 10, 2014).

54. FRIEDKIN, *supra* note 19, at 14.

55. REDONDO, *supra* note 1, at 417.

56. CALIFORNIA COASTAL COMMISSION, CALIFORNIA'S CRITICAL COASTAL AREA NO. 80: TIJUANA RIVER ESTUARY 1 (2006), *available at* http://www.coastal.ca.gov/nps/Web/cca_pdf/so-coastpdf/CCA80TijuanaRiverEstuary.pdf.

57. *See* ROBERT W. DUEMLING, U.S. DEP'T OF STATE FOREIGN SERVICE INSTITUTE, SAN DIEGO AND TIJUANA: CONFLICT AND COOPERATION BETWEEN TWO BORDER COMMUNITIES, 11, 13 (1980-81). The award-winning film *The New Tijuana* gives a vivid account of this flood. THE NEW TIJUANA (Espinoza Productions 1993).

58. *See* William C. Kennedy, Ecology and Border: The Case of the Tijuana Flood Control Channel (Sept. 4, 1978) (unpublished manuscript) (on file with *Water Law Review*); *see also* U.S. SECTION INT'L BOUNDARY & WATER COMM'N, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT: IMPROVEMENTS TO THE USIBWC TIJUANA RIVER FLOOD CONTROL PROJECT 3.1.1 (2008), *available at* http://www.ibwc.gov/Files/Fnl_PEIS_TJ_River_050608.pdf.

59. LAWRENCE A. HERZOG, WHERE NORTH MEETS SOUTH: CITIES, SPACE, AND POLITICS ON THE U.S.-MEXICO BORDER 201 (Victor J. Guerra ed., 1990); INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11, at 43-44.

60. TIJUANA RIVER VALLEY RECOVERY TEAM, RECOVERY STRATEGY: LIVING WITH THE WATER 3 (2012), *available at* http://www.swrcb.ca.gov/rwqcb9/water_issues/tijuana_river_valley_strategy/docs/Recovery_Strategy_Living_with_the_Water.PDF.

61. *Id.*

States.[62] The deposition of sediments to the TRNERR wetlands has diminished wetland habitat and has been a consistent matter of concern to reserve managers who have called on local governments to support the construction of sediment capture basins and urged greater binational cooperation in managing waste and sediment problems with the Tijuana municipality.[63]

In addition to these substantive challenges, local officials working in the watershed report serious logistical challenges in working with their counterparts across the border.[64] In the United States, for example, technicians with the San Diego Regional Water Quality Control Board, San Diego County, the TRNERR, and specialists from other governmental stakeholder agencies have difficulty just crossing the border to speak with Mexican officials with responsibilities affecting the watershed.[65] Local officials lack diplomatic credentials, meaning they lack authorization to cross the border in the course of routine work; such binational endeavors require special administrative authorization.[66] Obtaining authorization is difficult and time consuming. Mundane problems, such as the inapplicability of insurance that would cover the risks of local international travel, complicate cross-border travel.[67] These bureaucratic impediments make binational managerial collaboration for watershed management especially difficult.

In sum, the many management challenges now found in the basin make a compelling case for the need to strengthen binational management of the watershed beyond the current set of agreements in place. Fortunately, the two countries have a substantial tool kit of binational and multilateral agreements on which to draw on when considering any elaboration of their current shared commitments to managing the watershed.

IV. BILATERAL AGREEMENTS AND THEIR APPLICATION TO THE TIJUANA RIVER

As seen above, water management along the U.S.-Mexico border is generally regarded as a well-institutionalized, long-standing binational arrangement. The principal treaties, however, directly address the division and management of the waters of the Rio Grande and the Colorado Rivers, leaving a number of rivers and streams unapportioned and indirectly linked to the treaty system, all of these located along the land boundary between the two countries. With the

62. *Id.* at 7-8.

63. *Id.*; *Preventing Sediment from Entering the Reserve,* TIJUANA RIVER NAT'L ESTUARINE RESEARCH RES., http://trnerr.org/prevent-sediment-from-entering-the-reserve/ (last visited Jan. 28, 2014).

64. *See* Amy Hardberger, *What Lies Beneath: Determining the Necessity of International Groundwater Policy Along the United States-Mexico Border and a Roadmap to an Agreement,* 35 TEX. TECH L. REV. 1211, 1234 (2004).

65. *Id.*

66. *See* W.L. HARDGROVE, SOUTHWEST CONSORTIUM FOR ENVIRONMENTAL RESEARCH AND POLICY, FY2012-2013 FINAL REPORT 11 (2013).

67. Bart Christensen, Senior Eng'r of the San Diego Reg'l Water Quality Control Bd., Presentation at the Managing the Binational Tijuana River Watershed Workshop: Government Agencies & Local Challenges in the Watershed (May 14, 2013).

exception of the Tijuana River, which Article 16 of the 1944 Water Treaty referenced but did not allocate,[68] the treaty system incorporates these streams, including the Mimbres, Whitewater Draw, Rio San Pedro, the Santa Cruz, Rio Sonoyta, and the New River, either by riparian linkage to the drainages of the international rivers or by extension of the 1944 Water Treaty's Article 3 provision for solutions to border sanitation problems.[69] Other agreements, such as the 1983 La Paz Agreement,[70] the 1993 BECC-NADB Agreement,[71] the 1993 NAAEC Agreement,[72] and the 1935 U.S.-Mexico Migratory Bird Treaty[73] may also apply to these streams depending on the circumstances. A brief discussion of each of these instruments demonstrates the types of mechanisms available to the governments for dealing with aspects of Tijuana River management.

A. THE 1944 WATER TREATY

The United States and Mexico have not yet achieved binational allocation of the Tijuana River's waters, although they repeatedly discussed allocation the first half of the 20th century and incorporated it in the 1944 Water Treaty. At the time the drafters wrote the Treaty, the average total runoff for the Tijuana River was 74.8 million cubic meters (mcm)/60,641 acre-feet (af) - of which the United States was impounding 13.5 mcm/10,945 af (on the Rio Alamar/Cottonwood Creek branch) and Mexico was impounding 23 mcm/18,646 af (on the Rio de las Palmas branch).[74] While both nations planned additional storage projects in their respective territories, they originally conceived that at least one of these, the then-proposed Marron Dam on the Rio Alamar/Cottonwood Creek, would be an international dam, which both countries would jointly construct, with a storage capacity of 12 mcm, after which both countries would equally divide its water.[75] Such an arrangement would have required a formal treaty allocating this water, but it never came to pass.

Instead, at the time the United States and Mexico signed the 1944 Water Treaty, the two countries, lacking adequate hydrological data and wishing to avoid any further complications in reaching agreement on the Rio Grande and

68. 1944 Water Treaty, *supra* note 7, at art. 16.

69. *Id.* at art. 3.

70. *See* La Paz Agreement, *supra*, note 8, at arts. 2, 5.

71. Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Establishment of a Border Environment Cooperation Commission and a North American Development Bank, U.S.-Mex., art. II § 2(b), Nov. 16, 1993, T.I.A.S. No. 12516 [hereinafter BECC and NADB Treaty].

72. North American Agreement on Environmental Cooperation, U.S.-Can.-Mex., art. I, Sept. 8-14, 1993, 32 I.L.M. 1480.

73. Convention between the United States of America and Mexico for the Protection of Migratory Birds and Game Mammals, U.S.-Mex., art. I, Feb. 7, 1936, 50 Stat. 1311 [hereinafter the Migratory Bird Convention].

74. COYRO, *supra* note 3, at 743.

75. *Id.* It is also interesting to note that citizens of the City of San Diego in 1929 supported a ballot measure raising bonds for three dams in the Tijuana River watershed: Barrett, Morena, and Marron. *See City of San Diego Ballot Measures 1920-1929*, SANDIEGO.GOV, *available at* http://www.sandiego.gov/city-clerk/pdf/2029results.pdf. The city had already build two of these dams: Barrett and Morena. *See Water: Barrett Reservoir*, SANDIEGO.GOV, http://www.sandiego.gov/water/recreation/reservoirs/barrett/index.shtml (last visited Feb. 21, 2014); *Water: Morena Reservoir*, SANDIEGO.GOV, http://www.sandiego.gov/water/recreation/reservoirs/morena.shtml (last visited Feb. 21, 2014).

the Colorado Rivers, opted to treat the Tijuana River allocation as an agenda item for future study, referring to the river in Article 16.[76] Since then, original plans notwithstanding, the two nations have not built any other impoundments on the transboundary streams, Cottonwood Creek/Rio Alamar, Campo/Tecate Creek, or below Rodriguez Dam on the Rio de las Palmas.[77]

Of the two primary concerns Article 16 identifies- water allocation and flood control- the two countries have only utilized the flood control provision (see text in Table 1 below). In 1967 the two countries entered into agreement to jointly build channelization works on the Tijuana River, citing the authority found in Article 16.[78] The Tijuana River channelization project, completed in 1979,[79] is still the only instance in which the United States and Mexico have explicitly utilized their Article 16 authority.

Even so, Article 16 puts the governments on record as recognizing the value of an equitable division of the Tijuana River's water as well as the need to approach any division and joint development of storage works in an equitable manner.[80] It is also possible for the United States and Mexico to broadly construe Article 16's Section 2 provisions for flood control so as to apply to works that would benefit "domestic, irrigation, and other feasible uses of" the Tijuana River.[81] The general provisions of the 1944 Water Treaty found in Article 3, Articles 17-25 may also cover the Tijuana River.[82] What this means is that (I) the priority of uses associated with the established regime for the Rio Grande and Colorado Rivers would by extension apply to any agreement the parties might reach regarding the international waters of the Tijuana River unless otherwise excepted;[83] (II) that the sanitation provision in Article 3 applies to the river;[84] (III) that proprietary assumptions related to the development of works associated with implementing any future binational agreement also apply unless otherwise excepted;[85] and, (IV) that the IBWC's Article 24 authority to "initiate and carry on investigations and develop plans for works," "to exercise and discharge the specific powers and duties entrusted to the Commission," and "[t]o settle all differences that may arise between the two Governments with respect

76. 1944 Water Treaty, *supra* note 7, at art.16; HUNDLEY, *supra* note 16, at 133-34; REDONDO, *supra* note 1.

77. Philip R. Pryde, *A Geography of Water Supply and Management in San Diego-Tijuana, in* PLANNING THE INTERNATIONAL BORDER METROPOLIS: TRANS-BOUNDARY POLICY OPTIONS IN THE SAN DIEGO-TIJUANA REGION 45, 47 (Lawrence A. Herzog, ed., 1986).

78. INT'L BOUNDARY & WATER COMM'N, MINUTE NO. 225: CHANNELIZATION OF THE TIJUANA RIVER (June 19, 1967), http://www.ibwc.gov/Files/Minutes/Min225.pdf.

79. *Tijuana River Flood Control Project,* INT'L BOUNDARY & WATER COMM'N (Jan. 25, 2014), http://ibwc.gov/Mission_Operations/TJ_River_FCP.html.

80. 1944 Water Treaty, *supra* note 7, at art. 16.

81. *Id.*

82. *Id.* at arts. 3, 17-25.

83. *Id.*

84. *Id.* at art. 3. The IBWC, in Minute 283, has already recognized the application of the 1944 Water Treaty's sanitation provisions to the Tijuana River. *See* MINUTE 283, *supra* note 41, at 1.

85. 1944 Water Treaty, *supra* note 7, at arts. 16, 24.

to the interpretation and application of this Treaty" may also apply to the Tijuana River.[86] Importantly, as developments elsewhere in the treaty regime occur, advances in other treaty-governed watersheds may come to apply or serve as precedent for addressing problems in the Tijuana River basin.[87]

Table 1. 1944 Water Treaty/Title IV/Article 16

IV - Tijuana River
Article 16
In order to improve existing uses and to assure any feasible further development, the Commission shall study and investigate, and shall submit to the two Governments for their approval:
(1) Recommendations for the equitable distribution between the two countries of the waters of the Tijuana River system;
(2) Plans for storage and flood control to promote and develop domestic, irrigation and other feasible uses of the waters of this system;
(3) An estimate of the cost of the proposed works and the manner in which the construction of such works or the cost thereof should be divided between the two Governments;
(4) Recommendations regarding the parts of the works to be operated and maintained by the Commission and the parts to be operated and maintained by each Section.
The two Governments through their respective Sections of the Commission shall construct such of the proposed works as are approved by both Governments, shall divide the work to be done or the cost thereof, and shall distribute between the two countries the waters of the Tijuana River system in the proportions approved by the two Governments. The two Governments agree to pay in equal shares the costs of joint operation and maintenance of the works involved, and each Government agrees to pay the cost of operation and maintenance of the works assigned to it for such purpose.

Source: 1944 Water Treaty, *supra* note 7.

In sum, a number of important provisions of the 1944 Water Treaty do apply to the water management situation on the Tijuana River. These provisions set certain parameters for a future binational agreement or agreements on shared binational management of the watercourse. At minimum it means that the sanitation authority of the Treaty applies to the Tijuana River, that any future agreement related to its management would necessarily involve the IBWC at the diplomatic level, and that any management regime would certainly need to conform to the priority of uses now found in the Treaty. Provisions establishing proprietary responsibilities related to construction and implementation of any works or systems related to the agreed management regime likewise apply. Moreover, each of the IBWC's national sections has some measure of administrative initiative, subject to the concurrence of its own government, to

86. *Id.* at art. 24.

87. Paul Ganster has notably made this point. *See* Paul Ganster, Dir. of the Inst. for Reg'l Studies of the Californias at San Diego State Univ., Tijuana River Watershed and Potential Transboundary Watershed Management Mechanisms in the U.S.-Mexican Border Region, Address at the 2nd International Symposium on Transboundary Water Management (Nov. 16, 2004).

undertake actions that may advance binational cooperation for watershed management along the border. The best illustration of this is the U.S. section of the IBWC's establishment of Citizen Advisory Forums in various transboundary watersheds, including a San Diego Citizens Forum, established in 2002.[88] The IBWC's national sections also play a leading role in the Binational Technical Committee for the TRW that serves as a coordinating mechanism for Tijuana River water supply and sanitation discussions among federal and state water agencies on both sides of the border.[89]

B. THE 1970 BOUNDARY TREATY

The United States-Mexico 1970 Boundary Treaty[90] is unquestionably marginal to the character of any future agreement on the Tijuana River, but, as one of a limited number of treaties in force between the two countries, it warrants mention in this case.[91] While the 1970 Treaty applies to the boundary reach of the Rio Grande and the Colorado[92], it would have minimal relevance to the Tijuana River, which technically crosses the border twice - once upstream on the Cottonwood Creek branch of the river and another time as it enters the Tijuana River estuary just west of the international port of entry at San Ysidro/Tijuana. The 1970 Treaty does, however, establish the principle that any contemplated works should not impair the integrity of the international boundary and places jurisdiction for implementing this provision in the hands of the IBWC.[93]

C. THE 1936 MIGRATORY BIRD CONVENTION AND THE 1940 WESTERN HEMISPHERE CONVENTION

The United States and Mexico are parties to two closely related agreements, the 1936 Migratory Bird Convention and the 1940 Western Hemisphere Convention on Nature Protection and Wildlife Preservation, which together establish a bilateral and multilateral obligation to protect various migratory species of wildlife and their habitats.[94] These agreements, for example, reinforce binational commitment to sustain formal protected reserves on either side of the

88. *USIBWC Citizens Forum in San Diego*, INT'L BOUNDARY & WATER COMM'N (Feb. 8, 2014), http://ibwc.gov/Citizens_Forums/CF_SBIWTP.html.

89. *See* COMISIÓN ESTATAL DE AGUA DE BAJA CALIFORNIA, *supra* note 21, at 12.

90. Treaty to Resolve Pending Boundary Differences and Maintain the Rio Grande and Colorado River as the International Boundary, U.S.-Mex., Nov. 23, 1970, 23 U.S.T. 371 [hereinafter 1970 Boundary Treaty].

91. As of January 1, 2010, the United States and Mexico had signed a total of twenty-one bilateral treaties and conventions, the remainder of their bilateral agreements taking the form of formal protocols, executive agreements, memoranda of understanding, IBWC minutes, La Paz Agreement annexes, or other inter-governmental understandings. *See Treaties in Force: A List of Treaties and Other International Agreements of the United States in Force on January 1, 2010*, U.S. DEPT. OF STATE, 177-85 (2010), http://www.state.gov/documents/organization/143863.pdf. The majority of these bilateral treaties concerned boundary and water affairs. *Id.* This list, of course, does not include multilateral agreements.

92. 1970 Boundary Treaty, *supra* note 90, at art. I.

93. *Id.* at art. IV.

94. Migratory Bird Convention, *supra* note 73, at art. I; Convention Between the United States of America and other American Republics Respecting Nature Protection and Wildlife

border even where these reserves are not officially binational in character, such as the Tijuana River Estuary Research Reserve. While the administration of these agreements is left to the domestic authorities of each country (for example, the U.S. Fish and Wildlife Service in the United States[95] and the Secretariat of the Environment and Natural Resources in Mexico)[96] the agreements establish an important binational obligation that is contingent, at least in part, on the effective administration of shared water resources. Any binational negotiations on sharing Tijuana River water could draw upon these treaties in justifying water management to sustain ecosystem services.

D. THE LA PAZ AGREEMENT

As an executive agreement, the 1983 U.S.-Mexico Agreement on Border Environmental Cooperation,[97] otherwise known as the La Paz Agreement, now thirty years in effect, has considerable application to binational management of the Tijuana River. It establishes a regular mechanism for bilateral consultation and problem-solving on environmental issues, including water quality/water pollution concerns and conservation.[98] The La Paz Agreement also includes a provision encouraging data sharing and environmental assessment of projects and policies that may affect the border environment.[99] It establishes a diplomatic procedure whereby the two countries may develop subsidiary protocols in the form of annexes to the La Paz Agreement.[100] It further acknowledges that the 1944 Water Treaty takes precedence in water matters within its jurisdiction and does not affect the authority of the IBWC under the treaty.[101]

Coupled with IBWC Minute 270, the La Paz Agreement is the basis for a 1985 La Paz Annex agreement addressing international sewage and sanitation concerns in the lower Tijuana River reach of the international boundary.[102] As the foundation for the Border 2020 Program, it presently justifies the ongoing work of the local Baja California-California Regional Working Group and its Tijuana-San Diego Water Task Force, groups that focus on water quality, storm water management, and other water related environmental issues in the TRW.[103] The United States and Mexico can use the La Paz Agreement, coupled with the 1944 Water Treaty, to reinforce the priority of any agreement struck under Article 16 of the 1944 Water Treaty, to draw a strong link to environmental and

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Preservation in the Western Hemisphere, pmbl., Oct. 12, 1940, 56 Stat. 1354. [hereinafter Western Hemisphere Convention].

95. *Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service*, U.S. Fish and Wildlife Service, http://www.fws.gov/laws/lawsdigest/treaty.html (last visited Mar. 3, 2014).

96. *Treaties Governing Transboundary Wildlife Resources*, in THE U.S.-MEXICAN BORDER ENVIRONMENT: TRANSBOUNDARY ECOSYSTEM MANAGEMENT 291 (Kelly Hoffman ed., San Diego State University Press) (2006).

97. La Paz Agreement, *supra* note 8.

98. *Id.* at arts. 5-10.

99. *Id.* at art. 6.

100. *Id.* at art. 3.

101. *Id.* at art. 12.

102. *Id.* at annex I; MINUTE 270, *supra* note 41.

103. U.S. ENVTL. PROT. AGENCY, REPORT NO. EPA-160-R-12-001, BORDER 2020: U.S.-MEXICO ENVIRONMENTAL PROGRAM, 14, 20, 32, 34, *available at* http://www2.epa.gov/sites/production/files/documents/border2020summary.pdf (last visited Jan. 24, 2014).

ecological concerns, and to build on intersecting support for environmental and ecological objectives between the domestic agencies of the two governments if they become interested in implementing a new binational agreement on managing the TRW.

E. THE BECC/NADB AGREEMENT

The United States-Mexico Agreement to Establish a Border Environment Cooperation Commission ("BECC") and a North American Development Bank ("NADB"), is an executive agreement that entered into force January 14, 1994 and provides a mechanism for identifying, certifying, and funding needed environmental projects along the border.[104] The BECC is not a vehicle for reaching formal agreements on binational cooperation but does perform an important supporting role in developing the infrastructure that might be needed in service of such accords and, importantly, is tasked with insuring that its certified projects meet stipulated environmental protection criteria.[105] The BECC and NADB have been instrumental in funding water conservation projects associated with wastewater treatment plants, irrigation, and water storage projects binational agreements authorized under the authority of the 1944 Water Treaty.[106] Thus, these agreements contribute to increasing the capacity of the federal governments and subnational governments along the border in addressing watershed management issues.[107]

V. BINATIONAL DEVELOPMENTS OF RELEVANCE FOR THE TIJUANA RIVER SITUATION

A number of binational treaty-related developments related to water management, most of these originating in the mid-1990's, would seem to strengthen the position of the governments in moving forward with a more comprehensive agreement on managing Tijuana River water. These initiatives, most of them formalized at IBWC minutes, include Minute 306, dealing with ecosystem conservation in the Colorado River Delta;[108] Minutes 307 and 308, addressing water supply in the Rio Grande River and calling for a binational basin-wide advisory council to advise the IBWC on issues along the international reach of the river;[109] the establishment of the Water Conservation Investment Fund (WCIF)

104. BECC and NADB Treaty, *supra* note 71, at ch. I art. I §§ 2(i)(B), (E), 2(ii), art. II § 2(b), § 3(b).

105. *Id.* ch.I art. I § 1(b), § 2.

106. NORTH AMERICAN DEV. BANK, 2011 ANNUAL REPORT 1, 10-12 (Apr. 2012) *available at* http://www.nadbank.org/pdfs/publications/2011AnnualReport.pdf (last visited Feb. 8, 2014).

107. *See id.* at 1.

108. INT'L BOUNDARY & WATER COMM'N, MINUTE 306: CONCEPTUAL FRAMEWORK FOR UNITED STATES-MEXICO STUDIES FOR FUTURE RECOMMENDATIONS CONCERNING THE RIPARIAN AND ESTUARINE ECOLOGY OF THE LIMITROPHE SECTION OF THE COLORADO RIVER AND ITS ASSOCIATED DELTA (Dec. 12, 2000) [hereinafter Minute 306], *available at* http://www.ibwc.gov/Files/Minutes/Min306.pdf.

109. INT'L BOUNDARY & WATER COMM'N, MINUTE 307: PARTIAL COVERAGE OF ALLOCATION OF RIO GRANDE TREATY TRIBUTARY WATER DEFICIT FROM FT. QUITMAN TO FALCON DAM 1-2 (Mar. 16, 2001) [hereinafter MINUTE 307], *available at* http://www.ibwc.gov/Files/Minutes/Min307.pdf; INT'L BOUNDARY & WATER COMM'N, MINUTE 308: UNITED STATES ALLOCATION OF RIO GRANDE WATERS DURING THE LAST YEAR OF THE CURRENT CYCLE 1, 4 (June 28, 2002) [hereinafter MINUTE 308], *available at*

at the NADB, as certified by BECC;[110] and the IBWC's hosting of a Binational Summit in 2005 to assess and recommend administrative procedures for improving water management on the Rio Grande.[111] Minute 306, though tied to the 1970 Boundary Treaty, which applies to the boundary portion of the Colorado River and, thus, is not legally attachable to the Tijuana River situation, moves the IBWC forward in a very limited way by recognizing the importance of conserving the ecological values associated with international rivers.[112] Minutes 307 and 308 commit the two governments to managing water conservation in the Conchos River basin by extending Treaty authority supporting the establishment of the WCIF and calling for the establishment of a binational watershed advisory body to the IBWC[113] - two measures that legitimize the governments' use of Treaty authority for these purposes.

The involvement of BECC and NABD in these initiatives and the report of the Binational Summit illustrate the potential of using current binational agreements in complex multi-governance solutions that advance watershed management. While these measures are particular to the Rio Grande River basin, they are relevant to considering the elasticity of the treaty system for dealing with management of the Tijuana River and legitimizing government action, if two nations should choose to reach further agreement on the Tijuana River.

Additional treaty elasticity may also be found in several new linked agreements on the Colorado River. In 2010, the IBWC reached two agreements, Minute 317 and 318, that build on both the 1944 Water Treaty and the 1970 Boundary Treaty[114] to allow Mexico to store treaty water in upstream U.S. dams, establish a Binational Consultative Committee for water management on the lower Colorado River, and for the first time, establish a conceptual link for ecological preservation to the 1944 Water Treaty.[115] In November 2012, the two

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http://www.ibwc.gov/Files/Minutes/Minute308.pdf.

110. NORTH AMERICAN DEVELOPMENT BANK, QUARTERLY STATUS REPORT 18 (Sept. 30, 2013), *available at* http://www.becc.org/uploads/files/9-30-13_becc-nadb-sr_final_eng.pdf.

111. *Binational Rio Grande Summit*, INT'L BOUNDARY & WATER COMM'N, http://www.ibwc.gov/Organization/rg_summit.html (last visited Feb. 8, 2014).

112. MINUTE 306, *supra* note 108, at 1-2.

113. MINUTE 307, *supra* note 91; MINUTE 308, *supra* note 91. *See generally* Jean W. Parcher et al., *A Descriptive Overview of the Rio Grande-Rio Bravo Watershed*, 1 J. TRANSBOUNDARY WATER RES. 159, 159 (2010) (explaining the relationship between the Rio Grande and the Conchos River basin).

114. 1944 Water Treaty, *supra* note 7; 1970 Boundary Treaty, *supra* note 90.

115. INT'L BOUNDARY & WATER COMM'N, MINUTE 317: CONCEPTUAL FRAMEWORK FOR U.S.-MEXICO DISCUSSIONS ON COLORADO RIVER COOPERATIVE ACTIONS 2 (June 17, 2010), *available at* http://www.ibwc.gov/Files/Minutes/Minute_317.pdf; INT'L BOUNDARY & WATER COMM'N, MINUTE 318: ADJUSTMENT OF DELIVERY SCHEDULES OF WATER FOR THE YEARS 2010-2013 AS A RESULT OF INFRASTRUCTURE DAMAGE IN IRRIGATION DISTRICT 14, RIO COLORADO, CAUSED BY THE APRIL 2010 EARTHQUAKE IN THE MEXICALI VALLEY, BAJA CALIFORNIA 2, 4 (Dec. 17, 2010), *available at* http://www.ibwc.gov/Files/Minutes/Min_318.pdf. Prior to Minute 317, the only treaty justification for IBWC action in the area of ecology was found in Minute 306's reference to the 1970 Boundary Treaty, reflecting the resistance of Colorado River stakeholders to any extrapolation of the treaty that might establish an ecological claim to the river's waters. *See* MINUTE 306, *supra* note 108, at 1. Though a number of analysts have identified the need for an IBWC minute clearly establishing a legitimate ecological use for U.S.-Mexico treaty water, no such agreement currently exists. In this context, then, the reference in Minutes 317 and 318 to protecting ecological values on the Colorado River is an advance in the treaty regime.

governments announced Minute 319, which builds on these earlier agreements to reach a five-year temporary agreement on water provision for Colorado River Delta ecology.[116] While these developments are particular to the Colorado River basin, they provide a precedent for addressing ecological issues in other basins under treaty jurisdiction.

In sum, despite the absence of any formal binational agreement apportioning and managing the water of the Tijuana River, it is nevertheless evident that a number of binational and multilateral agreements are already in place that may guide and shape the contours of any future international agreement. At the very least, Article 16 of the 1944 Water Treaty highlights the need to address functional aspects of Tijuana River water management and provides a binational mechanism for reaching an agreement. This obviates the need to start from scratch in realizing an international accord or accords for the Tijuana River—as one knowledgeable observer put it, the IBWC already has the authority to convene a technical committee to study how the two countries might strengthen TRW management.[117]

Yet, despite the existence of this critical legal and diplomatic infrastructure, some of it half a century old and now bolstered by other binational agreements, the two federal governments have yet to strengthen their formal binational cooperation on the Tijuana River beyond flood control and sewage management, much less pursue an integrated approach to managing the watershed system. This binational policy paralysis persists in the face of growing recognition of the need for binational cooperation in managing water resources in the Tijuana River Watershed. Various studies and reports, including work by Paul Ganster,[118] Patricia Herrera and Jaqueline Lafragua,[119] Mark Spalding,[120] Christopher Brown and Stephen Mumme,[121] Suzanne Michel,[122] Juan Rodriguez Esteves,[123] and an influential study by the BWAC[124] suggest that the domestic institutional

116. INT'L BOUNDARY & WATER COMM'N, MINUTE 319: INTERIM INTERNATIONAL COOPERATIVE MEASURES IN THE COLORADO RIVER BASIN THROUGH 2017 AND EXTENSION OF MINUTE 318 COOPERATIVE MEASURES TO ADDRESS THE CONTINUED EFFECTS OF THE APRIL 2010 EARTHQUAKE IN THE MEXICALI VALLEY, BAJA CALIFORNIA (Nov. 20, 2012), http://www.ibwc.gov/Files/Minutes/Minute_319.pdf.

117. Paul Ganster, *Transboundary Management for the Tijuana River Watershed*, SOUTHWEST HYDROLOGY 28, 29 (Sep./Oct. 2005), *available at* http://www.swhydro.arizona.edu/archive/V4_N5/feature8.pdf.

118. *See id.* at 28.

119. *See* Patricia Herrera & Jaqueline Lafragua, Mexican Institute of Water Technology, Address at Conference on Globalization and Water Management: The Changing Value of Water: An International Basin Management Council in the North Mexican Border (Aug. 6-8, 2001), *available at* http://www.awra.org/proceedings/dundee01/Documents/Herrera.pdf (last visited Feb. 8, 2014).

120. *See* Spalding, *supra* note 27, at 9, 11, 16, 19.

121. *See* Christopher Brown & Stephen P. Mumme, *Applied and Theoretical Aspects of Binational Watershed Councils (Consejos de Cuencas) in the U.S.-Mexico Borderlands*, 40 NAT. RESOURCES J. 895, 904-05, 907-09 (2000).

122. Suzanne Michel, *Place and Water Quality Politics in the Tijuana-San Diego Region*, in SHARED SPACE: RETHINKING THE U.S.-MEXICO BORDER ENVIRONMENT 233-64 (Lawrence Herzog, ed., 2000).

123. *See* Juan M. Rodriguez Esteves, *Disasters Associated with Climatic Phenomena on the U.S.-Mexican Border*, in THE U.S.-MEXICAN BORDER ENVIRONMENT: PROGRESS AND CHALLENGES FOR SUSTAINABILITY 327-344 (Erik Lee & Paul Ganster, eds., 2012).

124. *See* INST. FOR REG'L STUDIES OF THE CALIFORNIAS, *supra* note 11.

setting for watershed management has evolved considerably in both countries since 1990, including new legislative and administrative measures at several levels of governance that favor more integrated watershed planning and administration. Such developments would seem to strengthen the rationale for more robust binational governance of the TRW.

However, significant political obstacles confront any concerted effort to reach binational agreement on TRW management. Any move toward more comprehensive, treaty-based, binational cooperation on managing the TRW would need to proceed by taking account of certain political realities in binational water relations. These include (I) the U.S.-IBWC's inability to take initiative in the absence of strong state and local support;[125] (II) the need to reconcile centralized administration of water and ecological resources in Mexico with the decentralized, fragmented, state-based politics of water in the United States;[126] (III) the problem of satisfying competing water rights claims within the basin;[127] and, (IV) the need to reach binational consensus on a common set of priorities for watershed governance that are compatible with Article 3 of the 1944 Water Treaty, which establishes priorities for water use on the treaty rivers.[128] The political demands of building a supportive domestic political coali-

125. As Mumme has documented in previous work, the IBWC's U.S. Section is very much a creature of state and local constituencies along the border. *See* Stephen P. Mumme, *Regional Power in National Diplomacy: The U.S. Section of the International Boundary and Water Commission*, 14 PUBLIUS 115, 126, 131-33 (1984). The IBWC's Mexican Section, the Comision Internacional de Limites y Aguas (CILA) is centrally dominated and functions under the authority of the Mexican Secretaria de Relaciones Exteriores (SRE), depending both on the strong support of the SRE and Mexico's National Water Commission (Comision Nacional de Agua, or CNA) for its initiatives. *See generally* SECRETARIA DE RELACIONES EXTERIORES, ORGANIGRAMA (2011), *available at* http://www.sre.gob.mx/index.php/cancilleria/organigrama (last updated Mar. 12, 2013).

126. *See* HELEN INGRAM, WATER POLITICS: CONTINUITY AND CHANGE 13-16 (1990) (explaining U.S. water policy); Serge Dedina, *The Political Ecology of Transboundary Development: Land Use, Flood Control and Politics in the Tijuana River Valley*, 10 J. BORDERLANDS STUDIES 89,89 (1995) (explaining the problems associated with differences in national water management of the Tijuana River); Margaret Wilder & Patricia Romero Lankao, *Paradoxes of Decentralization: Neoliberal Politics and Water Institutions in Mexico*, 34 WORLD DEV. 1977, 1977 (2006) (explaining Mexican water policy). It is worth noting that Mexico's national water law does not mention transboundary watersheds except to authorize the National Water Commission to intervene in any national water matter that may have an effect on international treaties or agreements. Ley de Aguas Nacionales [LAN] [National Water Law], *as amended*, art. 9.VII, Diario Oficial de la Federación [DO], 1 de Deciembre de 1992.

127. It is reasonable to assume that San Diego County property owners-mainly farmers and ranchers downstream of Morena and Barrett Reservoirs-would challenge any binational initiative to apportion water flowing to Mexico in Cottonwood and Campo/Tecate Creeks. Any new dam would require some form of agreement on protecting riparian flow, much as the originally proposed Marron Dam (which would have lied at or near the boundary) would have done, if only to protect groundwater stock upstream of the dam. REDONDO, *supra* note 1, 233-34 (discussing Marron Dam). The authors have been unable to locate any analysis of riparian flows or groundwater stock on Campo Creek and Cottonwood Creek below Barrett Dam.

128. 1944 Water Treaty, *supra* note 7, at art. 3. This article stipulates the priority of use for waters of treaty-controlled rivers and would certainly apply to any binational effort to adjudicate and manage Tijuana River water. Because the Treaty favors domestic and municipal and agricultural water uses, which currently prevail within the watershed in both countries, the most likely source of disagreement and compromise is the relative importance of ecological uses of water. Without future agreement on ecological uses of treaty water, both countries would need to justify such uses on the basis of fishing and hunting or "other beneficial uses" under Article 3.

tion for such an agreement in both countries are likely to be quite high, particularly in the San Diego region and California. Numerous organized water-related stakeholder groups exist in both areas, and major institutional water interests like the Metropolitan Water District of Southern California would need to be on board.[129]

VI. BINATIONAL MANAGEMENT INITIATIVES FOR THE TIJUANA RIVER WATERSHED

Despite these challenges, there is some basis for optimism that the United States and Mexico may make progress in strengthening binational cooperation on the TRW. True, they have made little progress towards insuring security of supply through formal allocation of surface and groundwater resources, protecting ecological resources, addressing water quality issues outside the scope of the international wastewater treatment process, or establishing a systematic administrative mechanism for managing water related problems in the TRW in an integrated or more coordinated fashion. Yet, as recounted above, the countries have realized some nation-to-nation agreements affecting the watershed-including sanitation measures, emergency water transfers, and flood control measures- much of this under the authority of IBWC and the 1944 Water Treaty. Various cross-border subnational agreements and informal initiatives responding to local watershed concerns complement these measures, most of these occurring since 1993 (Table 2). While federal agencies have brokered some of these initiatives, most are the product of sub-state or non-state citizen initiatives at the local and regional level.

At the federal level, the Border Liaison Mechanism (BLM), dating to 1993, places U.S. and Mexican consular officials in the role of conveners for watershed related concerns and has facilitated a good deal of dialogue among various governmental and non-governmental stakeholders over the past two decades.[130] The BLM has been instrumental in building local government-to-government linkages supporting citizen networks aimed at dealing with problems as diverse as water quality, sewage, and stormwater drainage, and facilitating inter-institutional contacts involving educators and non-profits interested in understanding and improving conditions in the watershed.[131] The BLM has become the primary venue for the San Diego Association of Governments' Border Water Council–an influential group of governmental stakeholders including the San Diego Water Authority, San Diego County, the City of San Diego, the IBWC, Environmental Protection Agency, other federal agencies, and tribal governments on the U.S. side and Mexico's Comision Nacional de Agua, Secretaría del Medio Ambiente y Recursos Naturales, Comision Internacional de Limites y Aguas, Comisión Estatal de Servicios Públicos de Tijuana, and the Tijuana municipality.[132]

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129. As Spalding cogently observes, environmental administration and regulation in the border region is "a confusing web of international, federal, tribal, state, and local agencies and jurisdictions," complicating the problem of reaching political consensus. Spalding, *supra* note 27, at 18.

130. *See* Brown & Mumme, *supra* note 121, at 906-07; Ganster, *supra* note 117.

131. *See* Brown & Mumme, *supra* note 121, at 906-07, 912.

132. *See* Michel, *supra* note 122, 253-255.

Important federal initiatives have also evolved through the Border XXI and Border 2012 Programs originating in the mid-1990's.[133] Under the just-completed Border 2012 Program, the California-Baja California Regional Workgroup has pursued an agenda including coastal water quality monitoring as well as funding an artificial wetland demonstration project to assist with sewage treatment from Tecate's wastewater treatment plant.[134] The IBWC's U.S. Section, beginning in 1999, established a series of Citizen Forums along the border,[135] one of which is focused on the San Diego-Tijuana area and the Tijuana River estuary.[136] While the San Diego-Tijuana Forum's board is comprised of U.S. citizens, it strives to draw on binational expertise in discussing IBWC projects and related activities in the watershed.[137] Following destructive flooding in 2008, which damaged human settlements in Tijuana and deposited harmful sediments in the estuary downstream, the IBWC was instrumental in helping organize the Tijuana River Valley Recovery Team.[138]

Table 2. Partial List of Binational TRW Initiatives (1993-2010)

Federal	Border Liaison Mechanism[139] Border 2012 California-Baja CaliforniaRegional Workgroup[140] Border 2012 Grant Program -volunteer binational beach monitoring program[141] Border 2012 TRW Task Force[142] IBWC-U.S. Citizen Forum[143]
State/Regional	Border Water Council/Binational Technical Committee[144]

133. Mark J. Spalding, *Governance Issues under the Environmental Side Agreement to the NAFTA*, in SUSTAINABLE DEVELOPMENT IN SAN DIEGO-TIJUANA 57 (Mark J. Spalding, ed., 1999).

134. *U.S.-Mexico Border 2012 Program: California-Baja California Regional Workgroup*, ENVTL. PROT. AGENCY, http://www.epa.gov/border2012/regional/workgroup-ca.html (last visited Feb. 4, 2014).

135. *Citizens' Forum Meetings,* INT'L BOUNDARY & WATER COMM'N, http://ibwc.gov/Citizens_Forums/citizens_forums.html (last visited Feb. 4, 2014).

136. *USIBWC Citizens Forum in San Diego*, INT'L BOUNDARY & WATER COMM'N, http://ibwc.gov/Citizens_Forums/CF_SBIWTP.html (last visited Feb. 4, 2014).

137. *Id.*

138. Steve Smullen, Area Operations Manager USIBWC San Diego Field Office, San Diego Office Update: San Diego Citizen's Forum, (Aug. 25, 2011) (Powerpoint available at http://www.ibwc.gov/Files/CF_SD_Proj_Overview_082511.pdf); *See generally* TIJUANA RIVER VALLEY RECOVERY TEAM, *supra* note 60.

139. *See generally* Brown & Mumme, *supra* note 121, at 906-07, 912.

140. *See generally U.S.-Mexico Border 2012 Program, supra* note 134.

141. *See generally id.*

142. *See generally Border 2012 Water Task Force for the Tijuana River Watershed,* TIJUANA RIVER WATERSHED (last modified May 6. 2013), http://trw.sdsu.edu/English/Border/border.html.

143. *See generally Citizens' Forum Meetings, supra* note 135.

144. *See generally Borders: Current Borders Projects*, SAN DIEGO ASS'N OF GOV'TS, http://www.sandag.org/index.asp?classid=19&fuseaction=home.classhome (last visited Feb. 11, 2014); INST. FOR REG'L STUDIES OF THE CALIFORNIAS, ADDENDUM TO THE BINATIONAL VISION FOR THE TIJUANA WATERSHED 365 (2005) [hereinafter ADDENDUM TO THE BINATIONAL VISION], *available at* http://www-rohan.sdsu.edu/~irsc/docs/pubs/Tijuana_River_Watershed_Binational_Vision_Addendum.pdf.

	Binational Integral Flood Alert System in TRB-2003[145] Border EcoWeb[146] Tijuana-California Los Laureles Canyon sediment improvement agreement of 2006[147]
Local/County/Municipal	San Diego Association of Governments/Border Water Council[148] Binational Watershed Advisory Council[149] Binational Environmental Education Web[150] Bren School of Environmental Science & Management, University of California Santa Barbara[151] Regional Workbench Program[152] Oscar Romo and Keith Pezzoli's Los Laureles Canyon Project[153] San Diego County Tijuana Watershed Advisory Committee[154] Proyecto Bio-regional de Educacion Ambiental (PROBEA)[155] Proyecto Fronterizo de Educación Ambiental

145. *See generally* Esteves, *supra* note 123; BINATIONAL VISION, *supra* note 11, at 158.

146. *See generally* BORDER ECOWEB: GUIDE TO FINDING ENVIRONMENTAL INFORMATION ABOUT THE U.S.-MEXICAN BORDER REGION THROUGH THE INTERNET (Elena Lelea & Paul Ganster eds., San Diego State University,1999).

147. *See generally* Sandra Dibble, *Focus of cross-border agreement is cleanup of canyon in Tijuana*, SAN DIEGO UNION TRIBUNE (Sep. 29, 2006), *available at* http://www.utsandiego.com/uniontrib/20060929/news_6m29canyon.html.

148. *See generally* SAN DIEGO ASS'N OF GOV'TS, *supra* note 144.

149. *See generally* BINATIONAL VISION, *supra* note 11, at 3, 241-42.

150. *See generally* BORDER WIDE ENVTL. EDUCATION COALITION, http://www.bordereeweb.net/ (last modified Mar. 28, 2011).

151. *See generally* Bren Sch. of Envtl. Sci. & Mgmt., *About Bren*, U. OF CAL. SANTA BARBARA, http://www.bren.ucsb.edu/about/ (last modified Nov. 15, 2013); Kavita Heyn et al., Mitigation of Impaired Stormwater Quality in Los Laureles Canyon, Tijuana, Mexico iii (Mar. 2008) (unpublished MESM thesis, University of California Santa Barbara) *available at* http://www.bren.ucsb.edu/research/documents/TijuanaReport.pdf (a group project submitted in partial satisfaction of the requirements for a Master degree at Bren School of Environmental Science and Management).

152. *See generally* Keith Pezzoli, Urban Studies and Planning Program, *Building a Regional Workbench for Sustainable Development* 1 (Nov. 2, 2000) *available at* http://www.researchgate.net/publication/228457883_Building_a_Regional_Workbench_for_Sustainable_Development.

153. *See generally* Emily To & Marie Albano, *Program Spotlight: Los Laureles* Canyon, U. OF CAL. SAN DIEGO GLOBAL HEALTH INITIATIVE, http://globalhealth.ucsd.edu/resources/spotlights/Pages/program-spotlight.aspx (last visited Feb. 11, 2014).

154. *See generally Watershed Priorities: Tijuana River Watershed, Baja California & CA*, ENVTL. PROT. AGENCY REGION 9, http://www.epa.gov/region9/water/watershed/tijuana.html (last updated Sep. 25, 2013).

155. *See generally* U.S. DEP'T OF AGRIC. TIJUANA RIVER WATERSHED COMMC'NS GRP., CLEVELAND NATIONAL FOREST PROJECTS AND PLANS - TIJUANA RIVER: ONE RIVER THREE NATIONS, RESOURCES GUIDES 2 (2009); BINATIONAL VISION, *supra* note 11, at 249; *About PROBEA*, SAN DIEGO NAT. HIST. MUSEUM, http://sdnhm.org/education/programas-de-educacion-mexico/education-programs-mexico/about-probea/ (last visited Mar. 8, 2014).

	(PFEA)[156] Ja Jan[157] Los Niños de Baja California[158] Binational Flood Warning system for Tijuana Watershed (2000)[159] No Border Sewage Program[160]

The State of California, which has a substantial long-term investment in sustaining the Tijuana River estuary,[161] has also engaged Mexican governmental partners at the state and municipal levels for watershed enhancements, most recently in striking a deal with the Tijuana municipality aimed at sediment control in one of the principal contributing drainages to the Tijuana River estuary at Los Laureles Canyon.[162] California's Water Quality Control Board, Coastal Commission, and Coastal Conservancy also encourage and occasionally fund various local initiatives aimed at water quality and ecological improvement in the watershed.[163]

At the local level, a considerable number of watershed initiatives and projects have emerged, most addressing very particular problems that link to the federal and state programs mentioned above. One such initiative, the BWAC, was formed in 2002 after California passed Proposition 13, which funds watershed management plans throughout the state.[164] With the support of the Regional Water Quality Control Board and San Diego County, San Diego State

156. *See generally* U.S. DEP'T OF AGRIC. TIJUANA RIVER WATERSHED COMMC'NS GRP., *supra* note 155, at 3; BINATIONAL VISION, *supra* note 11, at 249; *Misión*, PROYECTO FRONTERIZO DE EDUCACIÓN AMBIENTAL, http://pfea.org/alrescate/mision/ (last visited Mar. 8, 2014).

157. *See generally* U.S. DEP'T OF AGRIC. TIJUANA RIVER WATERSHED COMMC'NS GRP., *supra* note 155, at 7; BINATIONAL VISION, *supra* note 11, at 259.

158. *See generally* U.S. DEP'T OF AGRIC. TIJUANA RIVER WATERSHED COMMC'NS GRP., *supra* note 155, at 7; BINATIONAL VISION, *supra* note 11, at 259; *About Los Niños*, LOS NIÑOS DE BAJA CAL., https://sites.google.com/a/viainternational.org/losninos/about (last visited Mar. 8, 2014).

159. *See generally* Jim King, *New Flood Warning System in Hazardous Mexico Border Zone*, CAL. COAST & OCEAN, Winter 2001-02, at 30, 30-33.

160. *See generally Programs*, SAN DIEGO SURFRIDER FOUND., http://sandiego.surfrider.org/programs/no-b-s (last visited Mar. 9, 2014).

161. *See* NAT'L OCEANIC AND ATMOSPHERIC ADMIN., *supra* note 49, at 1, 3, 5; TIJUANA RIVER NAT'L ESTUARINE RESEARCH RESERVE, *supra* note 44, at 13, 17, 20; *see e.g.*, KAREN BANE, COASTAL CONSERVATORY, FILE NO. 00-068, SCWRP SCIENCE ADVISORY PROJECT (2006), *available at* http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2010/1005/20100527Board03E_So_CA_Wetlands_Recovery_Project_Ex2.pdf.

162. Kavita Heyn et al., Mitigation of Impaired Stormwater Quality in Los Laureles Canyon, Tijuana, Mexico iii (Mar. 2008) (unpublished MESM thesis, University of California Santa Barbara) *available at* http://www.bren.ucsb.edu/research/documents/TijuanaReport.pdf.

163. TIJUANA RIVER VALLEY RECOVERY TEAM, *supra* note 60, at 4; *see, e.g.*, DUEMLING, *supra* note 57, at 8, 10 (discussing the early engagement of the California Coastal Commission in Tijuana River Estuary preservation); Robert Donnelly, *Our Shared Border: Success Stories in U.S.-Mexico Collaboration*, WOODROW WILSON INT'L CENTER FOR SCHOLARS 47-48 (Jan. 2012), *available at* http://www.wilsoncenter.org/sites/default/files/Our%20Shared%20Border.pdf; *State Coastal Conservancy Public Meeting Minutes for May 24, 2012*, CALIFORNIA COASTAL CONSERVANCY 6 (May 24, 2012), http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2012/1208/20120802_May_Minutes.pdf.

164. BINATIONAL VISION, *supra* note 11, at 3, 212; Ganster, *supra* note 117, at 29; Spalding, *supra* note 27, at 20-21.

University helped create the BWAC as a binational partnership drawn from universities, non-profits, private sector organizations, and tribal governments, and charged with crafting a vision for managing the TRW on a binational basis.[165] The BWAC's comprehensive (except for water allocation) vision document led to the formation of a binational governmental stakeholder–the Technical Subcommittee–that is tasked with identifying binational and domestic actions that the countries could undertake in a coordinated fashion to cooperatively strengthen water management in the watershed.[166]

The BWAC spotlights a number of critical water supply and watershed management needs and proposes action plans to address them. One such action plan establishes a binational groundwater working group to oversee technical studies of groundwater in the basin, expand water reuse, and establish a binational Tijuana River Watershed Council to harmonize and coordinate watershed management actions across the border.[167] The BWAC report identifies a wide range of interesting policy options for watershed protection and sustainable use of its resources, including pursuing conservation easements, ecological parks, constructed wetlands, hardened but permeable road surfaces in Tijuana's squatter colonies, and other measures aimed at mitigating adverse ecological impacts, protecting human health, and ensuring human safety.[168] As yet, however, no binational master plan or formal operational proposal has emerged from this process. Nor has the BWAC's ambitious objective of establishing a Tijuana River Border Watershed Council[169] yet materialized, though it initiated a promising new effort to establish this body in May 2013.[170]

Additional organizations have undertaken other efforts in the past decade including county and municipal arrangements, civic action groups, and university networks. At the county and municipal level, the Tijuana Watershed Advisory Committee for San Diego County, the San Diego Association of Governments' Committee on Binational Regional Opportunities, and the Binational Flood Warning System for the Tijuana Watershed are among the policy forums and action initiatives currently addressing aspects of river management.[171] Binational citizen groups like the Binational Environmental Education Web, Proyecto Bio-regional de Educacion Ambiental, Ja Jan, Los Ninos de Baja California, and Proyecto Fronterizo de Educacion are directing attention to the river's pollution problems and its ecological value.[172] University research groups like the Institute for Regional Studies of the California's at San Diego State Uni-

165. BINATIONAL VISION, *supra* note 11, at 15; Ganster, *supra* note 117, at 29.

166. ADDENDUM TO THE BINATIONAL VISION, *supra* note 144, at 365; Ganster, *supra* note 117, at 29.

167. BINATIONAL VISION, *supra* note 11, at 160; ADDENDUM TO THE BINATIONAL VISION, *supra* note 144, at 371.

168. BINATIONAL VISION, *supra* note 11, at 4, 59, 154, 197-98, 204.

169. Spalding, *supra* note 27, at 20-21.

170. Decision made by participants, Managing the Binational Tijuana River Watershed Workshop (May 14-16, 2013).

171. BINATIONAL VISION, *supra* note 11, at 44; *About SANDAG: Committee on Binational Regional Opportunities,* SAN DIEGO ASS'N OF GOV'TS, http://www.sandag.org/index.asp?committeeid=34&fuseaction=committees.detail (last visited Mar. 9, 2014); ENVTL. PROT. AGENCY REGION 9, *supra* note 154.

172. *See supra* notes 150, 156-159 and accompanying text.

versity, the University of California San Diego's Regional Workbench, the University of California Santa Barbara's Bren School of Environmental Science and Management, and the Los Laureles Canyon Project collaboration between the TRNERR and the University of California have mobilized both research efforts and citizen support for Tijuana River remediation and protection that have also informed governmental initiatives mentioned above.[173]

These many and varied initiatives suggest that the climate for a more comprehensive, watershed-oriented, binational agreement is now more favorable than it has been in decades. Four recent developments point in this direction. The first, led by the San Diego Regional Water Control Board, is the establishment in 2012 of a binational, multijurisdictional Tijuana River Valley Recovery Team and Recovery Strategy designed to address many of the problems outlined above.[174] The second, mentioned above, is a renewed effort to resuscitate the Binational Vision Initiative and establish the long-discussed Binational Watershed Council to build on the efforts of the Tijuana River Valley Recovery Team and provide a practical coordinating council in support of comprehensive watershed management.[175] The third is the City of San Diego's and the Tijuana Municipality's renewed initiative to strengthen binational cooperation[176] and to include support for improved management of the Tijuana River.[177] Fourth, there is a new IBWC initiative, which local governments back, to reach a new agreement focused just on the problem of sediment control affecting the Tijuana River estuary.[178]

VII. PROTECTING THE TIJUANA RIVER WATERSHED

It is interesting that, more than half a century after the United States and Mexico signed the 1944 Water Treaty, both countries have only made limited diplomatic progress towards either allocating or managing the Tijuana River's waters and its watershed. As this analysis shows, this is not for want of public interest in the watershed over the past decade. Indeed, there is today a good

173. Pezzoli, *supra* note 152; Heyn, *supra* note 151, at 10; Bren Sch. of Envtl. Sci. & Mgmt., *supra* note 151; INST. FOR THE REG'L STUDIES OF THE CALIFORNIAS, http://www-rohan.sdsu.edu/~irsc/ (last updated Dec. 21, 2012).

174. Jeremy Haas, Envtl. Program Manager, Cal. Reg'l Water Quality Control Bd., Tijuana River Valley Recovery Team, Presentation at California-Mexico Border Relations Council (May 25, 2012), (Powerpoint available at http://www.calepa.ca.gov/Border/CMBRC/2012/May/JHaas.pdf).

175. Decision made by participants, Managing the Binational Tijuana River Watershed Workshop (May 14-16, 2013).

176. Jennifer Medina, *Building Ties to a Neighbor on the Border: San Diego and Tijuana Embrace a New Vision*, N.Y. TIMES, May 13, 2013, *available at* http://www.nytimes.com/2013/05/13/us/san-diego-mayor-building-economic-bridges-to-tijuana.html?pagewanted=all&_r=0.

177. *Preocupa Cuenca Binacional Rio Tijuana*, FRONTERA, May 15, 2013; Robert Filner, San Diego Mayor, Plenary Address to the Managing the Binational Tijuana River Watershed Workshop (May 14, 2013).

178. Denise Ducheny, Bart Christensen, & David Wells, Managing the Binational Tijuana River Watershed Workshop (May 14-16, 2013); *see* Memorandum from County of San Diego, distributed at the Managing the Binational Tijuana River Watershed Workshop (May 14-16, 2013) (explaining that the new IBWC minute would link sediment reclamation in the estuary to planned reclamation of the Nelson Sloan Quarry in San Diego County) (on file with *Water Law Review*).

deal of binational governmental and citizen-led effort to address issues within the watershed and to do so on a more comprehensive basis–as seen with the BWAC's 2005 assessment and recent initiatives to strengthen aspects of binational cooperation in the watershed. The region's rapid growth and interdependence ensure that public interest in TRW management will continue to grow, its extraordinary dependence on out-of-basin water sources notwithstanding. What has emerged to date, however, is more of a fragmentary, semi-coordinated effort to deal with pieces of the puzzle rather than a broad-gauged formal commitment or series of linked commitments to watershed management in the basin. The challenge here is to build on the many particular initiatives and cross-border connections that have been developing and solidifying among governments and NGO's over the past decade in order to generate the political support and momentum for a more comprehensive agreement.[179]

While the logic of comprehensive or integrated watershed management is compelling from conservation, ecosystem, and public health perspectives, the difficulty in moving forward in this issue area is partly related to the intrinsic nexus between water allocation and other elements of water management. Potential monetary costs, tradeoffs, and political hurdles associated with apportioning the river's water complicate the long-neglected allocation problem. Today's TRW management challenge, however, is only modestly related to the actual allocation of the river's water supply. Both countries have developed their own infrastructure to harvest and regulate surface water runoff and exploit available groundwater resources, establishing facts on the ground that will be hard to change. While some benefit would accrue by formally allocating remaining Tijuana River water resources, as was originally envisioned, neither country appears to have much incentive to do so. That is why both countries are more likely to successfully address the allocation issues when joined with the many other sustainable watershed management needs within the basin. The accumulation of public health and ecological concerns points to the need for greater binational cooperation based on a comprehensive vision and a formal, binational plan for securing water quality, public sanitation, and biodiversity within the basin.

Though many challenges stand in the way of further binational cooperation in the TRW, this article demonstrates that the existing treaty architecture is no obstacle to such cooperation; indeed, it is an asset rather than a hindrance. Article 16 still matters for embedding the Tijuana River in the 1944 Water Treaty regime; the La Paz protocols and other agreements also add to the diplomatic toolkit available to both countries for initiating negotiations and crafting agree-

179. Initiatives like the BWAC, as evident at the May 2013 Tijuana River Workshop, have arguably produced a critical mass of interested actors on both sides of the TRW–actors who not only bring critical perspectives on TRW's problems but who have much-needed links to local governments and are in a strategic position to push the governments to prioritize TRW management issues. Many of the BWAC's members, for example, participate in subnational forums like the CNA's watershed council for Baja California (Consejo de Cuenca) and USIBWC's San Diego Citizen Advisory Forum. *See generally* Jose Luis Castro & Paul Ganster, Participacion local transfronteriza en la frontera Mexico y Estados Unidos: El Consejo Consultivo de la Cuenca Binacional de Rio Tijuana, paper presented at 3rd National Congress of the Water Issues Network of the Mexican National Commission on Science and Technology (CONACYT), (Dec. 7-8, 2012) (paper on file with *Water Law Review*).

ments. The accumulation of new treaty-related agreements and initiatives elsewhere along the border, though not directly related to the TRW, strengthens the treaty basis for reaching such a comprehensive agreement on the TRW. Recent treaty progress on the Rio Grande and the Colorado Rivers, for example, endorses the idea of binational advisory commissions and the need to address ecological resources in managing the rivers.[180] This strengthens the case for principles and practices that the United States and Mexico could successfully apply to TRW management.

As Mark Spalding argued a decade ago, a comprehensive agreement on the TRW should focus on conservation and sustainable use of the river's resources, balancing ecological and social needs with economic development, and establishing an institutional foundation for binational management of the watershed.[181] The countries can most effectively accomplish this by directly linking the realization of ecological and social watershed objectives to the 1944 Water Treaty's Article 16 and the authority of the La Paz Agreement. A truly comprehensive approach would take advantage of the treaty's unrealized promise of Tijuana River water allocation in order to quantify, to the extent practicable, existing uncaptured runoff below Barrett Dam and commit such water to the preservation of ecological values on the Rio Alamar branch. Such an approach would also prohibit any additional groundwater extraction for municipal use on Mexican tributaries on the Rio Alamar that would significantly impair the availability of surplus flows for ecological benefit. In this respect, both countries would make concessions to sustain a modest, though variable, instream flow on the Alamar-Tijuana River to achieve a public good of value to both nations.

Both governments should likewise use Article 16 provisions to authorize adopting a binational framework for local projects reclaiming wastewater for ecological and amenity uses and for engaging in binational management of additional flood mitigation, stormwater management, sedimentation control and reclamation, and water quality protection and improvement. It is here that the governments should explicitly link the 1944 Water Treaty's Article 16 authority to the La Paz Agreement to justify binational sharing of watershed data and conservation initiatives, and inter-sector cooperation among federal, state, tribal, and county-municipal agencies, as well as the non-profit, civil-society sector. The governments should use this linked authority to formally create a Binational Watershed Council with the following duties:

(I) identify watershed priorities;

(II) coordinate intergovernmental and binational watershed activities that work with existing federal, state, and local authorities and non-governmental bodies to include the La Paz Agreement-based Border 2020 Watershed Task Force in the San Diego-Tijuana Region;

(III) solicit funding for prioritized projects, drawing on IBWC, EPA- Secretaría del Medio Ambiente y Recursos Naturales, and BECC-NABD resources as well as those of domestic governments;

(IV) build local watershed management capacity; and

180. MINUTE 317, *supra* note 115, at 3; MINUTE 319, *supra* note 116.

181. SPALDING, *supra* note 27, at 2-3.

(V) support public participation and program accountability in TRW management.

For this purpose, both governments should make express provision for subsidiary arrangements with the U.S. and Mexican consulates that authorize watershed authorities, at various levels of government, diplomatic license and risk protection to cross the border in the routine performance of their binational watershed duties.

In sum, and much in the spirit of what the late expert on U.S.-Mexican environmental diplomacy, Al Utton, termed "preventive diplomacy,"[182] the Tijuana River situation reminds us of the need to continue reinforcing binational management of water resources along the border, the imperative of linking advances in binational cooperation to the treaty instruments already in place, as well as the complexity and difficulty of doing so. After seventy years of waiting, the time has come for a comprehensive agreement on managing the Tijuana River.

182. Utton Transboundary Resources Center, *2004 Strategic Plan*, U. OF N.M. SCH. OF LAW. 1, 1 (2004), *available at* http://uttoncenter.unm.edu/pdfs/UC_Strategic_Plan_2004.pdf.

BOOK NOTES

Barbara Cosens, The Columbia River Treaty Revisited: Transboundary River Governance In the Face of Uncertainty, Oregon State University Press (2012); 455 pp; ISBN 978-0870716911; paperback.

In 1964, after nearly twenty years of negotiation, Canada and the United States began implementing the Columbia River Treaty ("CRT") in an effort to control floodwaters and harness the energy potential of the Columbia River. Barbara Cosens's edited collection of essays, *The Columbia River Treaty Revisited,* examines the past, present, and future implications of the CRT in the face of flood-control provisions expiring in 2024. Cosens's book grew out of a University of Idaho College of Law Natural Resources and Energy Symposium in 2009, and it is part of a project of the University Consortium on Columbia River Governance. The editor's goals for this multi-disciplinary text were to stimulate discussion about the treaty's viability, to predict changes, and to determine whether modifications are necessary. In light of the treaty's ten-year notification requirement for amendment or termination of the treaty, Cosens's book presents a variety of viewpoints to consider in reexamining the CRT's ability to provide amenable solutions for the numerous stakeholders in the Columbia River Basin.

Cosens's book is organized around the idea of uncertainty and the authors focus on several factors that could contribute to rapid ecological, economic, and social changes and create more competition for a water resource that transcends jurisdictional and national borders. These factors include (i) changing societal values, (ii) the empowerment of local communities, (iii) the changing viability of anadromous fish populations, (iv) climate change, and (v) mounting population and energy demands. The authors examine these factors using a variety of methodologies, revealing divergent opinions that are likely analogous to the discussions that took place prior to the CRT's enactment.

Part I of the book provides a historical analysis of the Columbia River and the CRT itself. The authors in this section look at the CRT's implementation and the subsequent social changes that resulted in changing local values. As James Barton and Kelvin Ketchum describe, the Columbia River Basin covers 259,500 square miles, fifteen percent of which are in Canada. It spans seven states, British Columbia, aboriginal lands of the First Nations in Canada, and fifteen Native American reservations in the United States. Because of its vast drainage basin, contributor Anthony G. White views the river as a product of both physical and political geography: the earth's composition, including the Rocky Mountains, gives the river its power and volume, while regulations divide its resources and dictate who can use it and within what limits.

As Mary L. Pearson points out, the Columbia River has long been a locus of economic and technological activity. Commercial fishing and canneries began setting up shop in 1866, and the United States Army Corps of Engineers began building locks at the Cascades in 1896. It was the 1948 flood, however,

that was the turning point for the river, because it revealed a dearth of storage capacity to collect runoff and prevent flooding. Thus, as Barton and Ketchum point out, the need for flood control via storage became vital to the region. The best storage sites, however, were located in Canada, necessitating a transboundary agreement.

The largest obstacle in completing the CRT was a perceived inequity of benefits. All of the new dams were in British Columbia, but the bulk of hydropower and flood control benefits flowed to the United States. The CRT represented a solution to this perceived inequity by dividing the benefits between the United States and British Columbia and allowing the province to sell its surplus power. As Jeremy Mouat opines, in many ways the CRT became a model for other regions facing similar issues with transboundary resource management.

Only in its proper historical context, however, can one truly understand the CRT. Thus, one must view the CRT within the larger pursuit to transform the Columbia River from a natural river into a managed water resource for the purposes of economic efficiency and wealth maximization. The CRT is a product of its time and reflected societal values and water development programs of the period. As Paul W. Hirt and Adam M. Sowards argue, any new changes to the treaty must balance efficiency and equity to more accurately reflect contemporary values surrounding the river.

Matthew McKinney judges the CRT by both contemporary and historical standards, viewing the treaty as a success if measured by the goal of flood protection. However, CRT negotiations in 1964 never addressed the health of salmon fisheries and local participation of affected communities. Thus, a more contemporary focus on salmon fisheries and local sentiment can reflect recent societal and political changes in the basin.

Garry Merkel and Mary L. Pearson examine these societal and political changes from the viewpoint of First Nations members. Both authors discuss the cultural and economic importance of fish to the indigenous populations of the Columbia River Basin, who historically lived on or near rivers. Salmon shaped these societies, and depletion due to CRT implementation accordingly resulted in a reshaping of the societal framework. Both authors seek a political and ecological solution to preserving indigenous culture through a renegotiation of the CRT that involves local communities. Merkel and Pearson predicted the legal recognition of tribes and treaties in both the United States and Canada suggests a more inclusive process of negotiation will occur if the countries revisit the CRT

Part II uses a scientific approach to examine two major ecological changes in the Columbia River. The first major change is in the health of anadromous fish and the political inertia preventing efforts to address declining fish populations. As Chris Peery points out, the Columbia River is central to the regions ecology and is one of the most regulated and developed rivers in the world. Peery argues humans must be aware that they are part of the ecosystem and their behavior influences biological processes. For example, the Grand Coulee Dam brought energy to the region but also blocked salmon migration and decimated salmon populations. CRT stakeholders must carefully consider this type of influence over biological processes, Peery posits, if and when Canada and the United States renegotiate the treaty

In his essay, Carmen Thomas Morse discusses ongoing litigation over salmon recovery and the operation of federal dams. Although a variety of contributing factors exist, Morse argues that hydropower dams are the major factor in fisheries depletion. Any renegotiation of the CRT, therefore, must recognize these competing policy and ecological issues and find a way to reconcile them.

The other major ecological change discussed in this section is climate change. The CRT can account for the river's seasonal and year-to-year variation in water levels. Climate change, however, is beyond predictable variation and historical behavior. Anne Nolin, Eric Sproles, and Aimee Brown examine the effects of climate change on artificial storage in the region. While snowpack provides natural storage and regulates summer flows, climate change may reduce the amount of snow and water in the region. Therefore, the authors argue, current artificial storage is insufficient because the CRT provides a framework for high flow, but not low flow, management. The authors therefore call for more comprehensive models and snowpack measurement that can allow water managers to make quick and critical decisions in times of change.

Parts III and IV look at the future of transboundary cooperation in the face of uncertainty—namely, population change and increased energy demand. As Cosens points out in her introduction, hydropower is the main source of energy for the region and has grown in importance because of a lack of other options. Additionally, the region has experienced a variety of social and ecological changes since the CRT's enactment. Therefore, as Chris W. Sanderson argues, the treaty is a useful model for transboundary cooperation, but is no longer equipped to resolve the concerns of its various stakeholders.

Craig W. Thomas views the CRT's inability to resolve the concerns of various stakeholders as an institutional issue. He identifies bureaucracies, politically appointed commissions, and collaborative partnerships as the types of decision-making institutions that govern water resources in the Columbia River Basin. Although these institutions have advantages, they also have limitations that, if ameliorated, could provide solutions for resolving the concerns of various stakeholders. Thomas provides a two-pronged solution to the institutional issue. First, he calls for the decentralization of bureaucracies. This type of reform, premised on local involvement and decision-making, would allow for more institutional flexibility and adaptability that could be capable of addressing rapid changes in the Columbia River Basin. Second, Thomas seeks the creation of new institutions to link local collaborative partnerships to prevent overlapping activities and to coordinate communication between localities.

Overall, *The Columbia River Treaty Revisited* calls for CRT stakeholders to learn from the lessons of the past and create changes to the treaty that more accurately reflect contemporary social and ecological trends. One major trend is the recognition and involvement of local communities at the negotiation table. Another trend is greater recognition of ecological and cultural impacts like fisheries depletion and the corresponding impact on native and local communities.

If reconsidered correctly, the CRT can reconcile competing interests and be a model for transboundary water agreements. One can only hope, given the nature of political treaties and the variety of social values attached to the Columbia River, that any renegotiation of the treaty leaves no stakeholder high and dry.

Garrett Davey

Douglas S. Kenney and Robert Wilkinson, Editors, The Water-Energy Nexus in the American West, Edward Elgar, Northampton, MA (2011); 274 pp; $42.75; ISBN 978-0-85793-769-8; softcover.

Robert Wilkinson is an Associate Professor at the University of California Santa Barbara and also an advisor to businesses, non-profits, and governments on energy and water policy. Douglas Kenney directs the Western Water Policy Program at the University of Colorado Law School's Natural Resources Law Center. Mr. Kenney also writes about and advises governmental organizations on water related issues.

Mr. Wilkinson and Mr. Kenney teamed up to put together *The Water-Energy Nexus in the American West*, a collection of essays that seeks to inform the general public and to give decision-makers a solid footing in the law, economics, and science that connects water and energy use in the western United States. The book is organized into four parts: Introduction and Overview; Water for Energy; Energy for Water; and Solutions: Examples of Ways Forward.

Part One, "Introduction and Overview," consists of Chapters One and Two. Chapter One explores the links between energy and water. For example, energy systems and primarily electricity generation account for the largest water use in the United States. Furthermore, the transportation of water consumes nearly twenty percent of all the electricity used in California. Chapter One posits that integrating water and energy management can vastly increase the economic efficiency of both systems by reducing capital and operating costs. These efficiencies would lead to lower tax burdens and improve a community's quality of life through increased environmental stewardship and integrated management style requirements. Chapter Two analyzes how petrochemical, electrical, and biofuel production degrades natural riparian environments. The Chapter concludes that conserving both water and energy will increase efficiency and foster healthier river systems.

Part Two, "Water for Energy," covers Chapters Three through Seven. Chapter Three addresses coal. Generally, a coal mine uses water to suppress dust generated during mining operations. That water can damage ecosystems by increasing the acidity in the streams that capture coal-mining runoff. Once mined, coal-fired power plants create electricity by boiling pure water in a closed loop system to produce steam and pressure, which spin turbines to produce electricity. Electricity generation accounts for ninety percent of all domestically mined coal. The generation plant uses a local water source to condense the steam back into water via a heat exchanger. This cooling process seriously impacts local water resources by increasing water temperatures downstream from the power plant. In order to avoid raising a stream's temperature, the power plant must permanently consume larger quantities of water in order to condense

the steam back to water. Fly ash, a coal-combustion byproduct containing arsenic, lead, and mercury, has also contaminated groundwater in the instances where it was improperly contained.

Chapter Four moves on to shale oil and discusses how the large quantities of water needed to access shale oil via the process of hydraulic fracturing would impact other water uses and the environment. The process also raises potential legal issues such as current water rights and interstate water agreements. Although the authors wrote this chapter before the shale oil boom was fully underway in the United Sates, it remains relevant because shale oil's actual impacts are still not fully understood.

Up to this point, discussion concerning fossil fuels deals only with fossil fuels' water needs and how using those fossil fuels negatively impacts water quality and water supply. Chapter Five reverses that theme by addressing the water generated from coal bed methane (CBM) production, which could potentially augment local water supplies. Due to coal's geology, most coal deposits are saturated with methane, a type of natural gas, and water. Water production is an unintended consequence of accessing a coal bed's methane supply, and the produced water's quality varies greatly between coal deposits and even within the same deposit. Chapter Five addresses the legal questions surrounding the production, use, disposal, and management of CBM water and gives examples of how several western states incorporate CBM water into their prior appropriation regulatory systems. Finally, the chapter laments that this potentially useful water source typically either languishes in evaporation ponds or is injected deep underground. The authors attribute this phenomenon to western states' laws that typically treat CBM water as a waste byproduct and do not require the water be put to a beneficial use. Further, there is rarely an economic incentive for companies to put CBM water to beneficial use of their own accord.

The next two chapters discuss renewable energy sources that use water to generate energy. Chapter Six focuses on concentrated solar power (CSP). CSP uses essentially the same method to produce electricity as the coal-fired power plant described above, with the major difference of using solar energy instead of burning coal to produce the heat required to generate steam. Large mirror arrays concentrate the sun's energy on a specific point to create enough heat to generate steam. Although electricity generation via coal and CSP both have the same impact on local water supplies, CSP does not raise the environmental concerns caused by mining and burning coal. This chapter touches on the state and federal policies affecting solar power, different CSP technologies, the cooling technologies available to concentrated solar power installations, and how western states value the water required to generate concentrated solar electricity.

Chapter Seven discusses biofuels, with an emphasis on policies that created demand for biofuels over the past few decades. Such policies are a means to attenuate the United States' reliance on imported petroleum and include laws to open agriculture to new markets, job growth measures, and the federal Renewable Fuels Standard. Chapter Seven also describes the current technological trends in biofuel production and the water requirements for both growing feedstock and processing that feedstock into biofuel.

Part Three, "Energy for Water," covers chapters eight through twelve. Chapter Eight explores the energy and water interdependencies of the Central

Arizona Project, which distributes Colorado River water across central and southern Arizona. Chapter Nine details energy intensity, the total amount of energy required to use a given amount of water at a specific location, for many existing and proposed water supply projects throughout the southwestern United States. Chapter Nine then provides less energy intensive alternatives for these projects, such as water conservation, water recycling, and temporary agriculture-to-urban water leases.

Chapter Ten focuses on desalination and describes the various desalination technologies and their respective energy requirements, as well as the advantages and disadvantages to converting brackish groundwater or seawater into usable water supplies. Brackish groundwater is groundwater, usually in an aquifer, which absorbed enough salts while percolating through the soil to necessitate desalinization before the water is fit for irrigation or municipal use. Chapter Eleven offers an in-depth case study of Utah's Jordan Valley Water Conservation District, while Chapter Twelve details the important role electricity plays in Arizona's water systems.

Part four, "Solutions: Examples of Ways Forward," covers chapters thirteen through seventeen and provides solutions to issues identified in the book's previous chapters. Chapter Thirteen explores whether adaptive management practices, which account for scientific uncertainty in managing natural systems, can help balance energy development needs with environmental concerns. Chapter Fourteen looks at the decision-making process and offers tools to support water supply decision-makers in better managing issues that arise from the water-energy nexus. Decisions involving the energy-water nexus require such support because certain factors requiring consideration have a larger scope than the issues decision-makers typically consider, such as multiple objectives, long time horizons, the large number and varied interests of stakeholder groups, and the total number of decision makers involved in the process.

Chapter Fifteen addresses integrated planning at the state level for both energy and water, with an emphasis on the Western Governors' Association's Regional Transmission Expansion Project (RTEP). The Western Governors' Association (WGA) is a bipartisan group representing nineteen western states. The WGA encourages regional collaboration to promote vibrant and sustainable communities and economies. Through the RTEP, which began in 2009, the WGA works with other regional and national entities, such as the Department of Energy and the national laboratories, to build a framework that integrates water supply considerations when planning new electrical transmission expansions. The WGA will use the RTEP to promote practical solutions to water-energy nexus challenges.

Chapter Sixteen examines the many benefits and few drawbacks of electricity generating systems that are largely decoupled from the water supply, such as certain solar technologies and wind turbines. Chapter Seventeen, the final chapter, looks at California's bourgeoning efforts to both reduce greenhouse gas emissions and prepare for climate change, while simultaneously creating more efficient energy and water systems across the state.

The Water-Energy Nexus in the American West is an extremely comprehensive, if dense, survey of many of the energy and water issues facing state and local governments. The book clearly caters to policy makers in the arid and

semi-arid areas of the western states, which helps to make the often-difficult and nuanced issues surrounding the water-energy nexus in a water-scarce area more relatable and accessible to western residents. Furthermore, this book is ideally suited to offer a solid baseline understanding of the water-energy nexus to elected and appointed officials who are unfamiliar with the subject.

Gabriel Kester

Farhana Sultana and Alex Loftus, Editors, The Right to Water: Politics, Governance and Social Struggles, Earthscan, New York, NY (2012); 262 pp; $53.95; ISBN 978-1-84971-360-3; hardcover.

"The Right to Water: Politics, Governance and Social Struggles" surveys how a variety of actors conceive of and implement the right to water across the globe. In its initial chapters, the book, edited by Farhana Sultana and Alex Loftus, expounds on what a right to water means. Each of these chapters puts forth its own analysis and critique of the right. The authors ground their arguments in the theories of inter-related academic disciplines such as geography, political science, and law. The second half of the book shifts focus. In these later chapters, the authors delve into the water justice movements in particular countries or regions. The case studies range widely in structure and location: in Chapter 7, the reader learns about the Maori tribe's water-based identity, while in Chapter 8, the reader learns about the European Union's approach to water management.

The preface locates the book in time and space. Some of the chapters originated as papers for an international conference entitled "The Right to Water," held at Syracuse University over March 29 and March 30, 2010. The conference addressed how water activists can equitably advance the global right to water.

In the foreword, activist Maude Barlow discusses the United Nations General Assembly's passage of two important resolutions concerning the global right to water and sanitation. Barlow's foreword reads as a call to arms for water activists. It concludes with rhetorical questions about how public and private actors should conceive of the right to water. The chapters that follow explore these questions.

In Chapter 1, "The right to water: prospects and possibilities," the book's editors introduce the global water justice movement and the topics of the chapters to come. The editors identify two major divisions in rights discourse: commodification versus rights and the public versus private management of water. The thesis of the book is "to bring a geographical sensitivity to calls for a universal right to water: within this, we see the right to water as one necessary but insufficient moment in the struggle to achieve equitable access to water for all."

In Chapter 2, "Commons versus commodities: debating the human right to water," Karen Bakker develops a framework for analyzing market environmental reforms such as neoliberalism and applies the framework to water. Bakker criticizes the problems endemic to neoliberal reforms. She notes that the privatization of water services is legally compatible with the human right to water. Bakker argues that conceiving of water as a commons allows the reformation

process to transcend the public/private binary and thereby accomplish more progressive water reform. Bakker's critique of the rights discourse receives clarification and criticism in many of the following chapters.

In Chapter 3, "The human right to what? Water, rights, humans, and the relation of things," Jamie Linton discusses the right to water from a relational perspective. He derives this relational perspective from Marxist theory: rights form a collective, human identity ("species being"), and water is a hydrosocial process. Linton comes to two conclusions. First, he argues that the right to water includes community participation in water governance. Second, he argues that society as a whole should benefit from the value of water.

In Chapter 4, "A right to water? Geographico-legal perspectives," Chad Staddon, Thomas Appleby, and Evadne Grant discuss who has rights to water, and how and where people can obtain legal enforcement of such rights. The authors caution water activists to think deeply about the legal ramifications of enforcing a right to water. The authors note that human rights legislation usually benefits the very rich and the very poor. They also warn that corporations – to which countries like the United States have granted limited, legal personhood – could benefit from the legal right to water at the expense of parties with less bargaining power.

In Chapter 5, "The political economy of the right to water: reinvigorating the question of property," Kyle R. Mitchell views the struggle for the right to water as one of many contested relations in civil society. He argues that people overemphasize property's exchange value and underemphasize property's use value due to the historical evolution of capitalism. He also discusses the historical evolution of civil society and how the notion of a civil society occludes class disparities in liberal democracies. Mitchell concludes that the framework and realization of rights will determine the success of the right to water movement.

In Chapter 6, "Scarce or insecure? The right to water and the ethics of global water governance," Jeremy J. Schmidt analyzes prevailing forms of water governance. Schmidt deconstructs the theoretical propositions behind the forms' assumptions. He discusses how water scarcity and insecurity have become the main foci of global water management. Finally, he argues that people should conceive of water governance as a collective and communal process and that communal claims deserve incorporation and respect.

The book shifts focus to more individualized case studies in Chapter 7, "The right to water as the right to identity: legal struggles of indigenous peoples of Aotearoa New Zealand," by Jacinta Ruru. For the Maori tribe, of which Ruru is a member, water is everything. In Aotearoa, New Zealand, the Maori battle for water is for the preservation of tribal identity rather than access to clean water. Ruru details the Maori's success and failures in significant legal battles over water. Ruru concludes that other public and private interests often prevail over Maori water rights in Aotearoa.

In Chapter 8, "Legal protection of the right to water in the European Union," Marleen van Rijswick and Andrea Keessen explain European Union ("EU") citizens' right to water within the context of EU's legal framework. The EU and its 28 member states share responsibility in implementing and enforcing clean, sustainable, and equitable use of water. The EU has not formally recognized the right to water, but the authors argue that the EU's approach may trump

a formal right to water. Notwithstanding the EU's effective approach, the authors argue that the EU needs to become more transparent and more inclusive in its decision-making processes. Finally, the authors advocate for a broader right to water in the more industrialized member states.

In Chapter 9, "Rights, citizenship and territory: water politics in the West Bank," Ilaria Giglioli discusses the unique case of West Bank water rights. Giglioli describes the historical evolution of geo-politics in the West Bank and its effect on the region's water management. She argues that different levels of access to water exist because of different levels of citizenship. The British and then the Israelis provided Arab residents inadequate infrastructure and access to water because the two peoples contested the Arabs' rights to natural resources like water. Giglioli concludes by discussing the roles Palestine, Israel, and international actors play in this geo-political struggle and how even within each group there is disagreement about the right to water.

In Chapter 10, "Water rights and wrongs: illegality and informal use in Mexico and the U.S.," Katharine Meehan discusses the role of water illegalities in water justice movements. First, Meehan describes the historical evolution of water illegalities from the time of feudalism to the present. She notes the current paradoxical status of water as both a privilege and a possession. She applies her theoretical propositions to two case studies: Colorado and San Felipe del Progreso, Mexico. She discusses the extralegal and legal approaches to water in both states. She concludes by emphasizing that extralegal and illegal approaches to water add dimension – and perhaps reinforcement – to the advancement of a global right to water.

In Chapter 11, "The centrality of community participation to the realization of the right to water: the illustrative case of South Africa," Cristy Clark analyzes the role community participation plays in the realization of a human right to water. Clark uses the 2009 South African case *Mazibuko and Others v. City of Johannesburg and Others* to demonstrate her point. In *Mazibuko*, Soweto residents from Phiri contested the introduction of prepaid water meters and the South African government's allocation of water. Despite the explicit right to water in the South African Constitution, the court found against the Soweto residents. Clark argues that the judgment minimizes community participation. She believes that community participation is key because it empowers marginalized groups and allows them to challenge barriers to water access.

Patrick Bond further analyzes *Mazibuko* in Chapter 12, "The right to the city and the eco-social commoning of water: discursive and political lessons from South Africa." Bond discusses *Mazibuko*'s political lessons for a broader right to the city. Bond criticizes the legal strategies of the *Mazibuko* appellants. He believes that the appellants' legal team should have contextualized the dispute in order to illustrate the racial and class disparities in water access. More generally, he argues that each individual struggle for the right to the city must operate within the specific political-economic context it faces. In accordance with his Marxist perspective, he asserts the need for leftist organizations to unite and fight for a right to the city.

In Chapter 13, "Anti-privatization struggles and the right to water in India: engendering cultures of opposition," Krista Bywater explores the successful water justice movements in Plachimada, Kerala and Delhi, India. In Plachimada,

residents forced Coca-Cola to shutter operations on a plant depleting groundwater. In Delhi, activists prevented a project sponsored by the World Bank. Bywater traces the "political cultures of opposition" (PCOs) already in place for both movements. She argues that activists must capitalize on their PCOs in order to obtain the right to water.

In Chapter 14, "Seeing through the concept of water as a human right in Bolivia," Rocio Bustamante, Carlos Crespo, and Anna Maria Walnycki analyze the application of rights theory and discourse in Bolivian water management. The authors outline the historical evolution of water management in Bolivia. Traditionally, the state did not manage water in Bolivia; rather, communities managed their own water. The authors argue that the recent inclusion of the right to water in the Bolivian Constitution, the Plurinational Constitution of the State, has legitimatized the increased role of state possesses in water management. The authors conclude that the application of a right to water has led Bolivia toward the realization of equitable water management.

In Chapter 15, "From Cochabamba to Colombia: travelling repertoires in Latin American water struggles," Verónica Perera explores the influence that water struggles in Cochabamba and Uruguay have had on Colombian water activists. In both Cochabamba and Uruguay, activists and citizens successfully fought against the neoliberalization and privatization of water. Perera explains how these successes shaped the politically unsuccessful referendum for a right to water in Colombia. She initially thought that Colombian activists would view the referendum as a failure but, to her surprise, the activists saw their fight as successful because they used the referendum as a tool to promote water justice. Finally, she argues that rights discourse is crucial to the "travelling repertoire" of water justice movements.

The book provides a compelling argument for the human right to water. Readers will obtain a broad but shallow appreciation of rights movements around the world. The book's international focus leaves little room for discussion of the United States besides its perceived role as a synonym for globalization and neoliberalism. As is the case with most scholarly compilations, some chapters stand out more than others. For example, Bakker's chapter warrants particular attention because her critique of rights discourse serves as a lightning rod for rights discourse throughout the book. Such academic discussions pervade the book, and this scholarly bent may overwhelm readers looking for a more practical discussion of the right to water.

Emily Miller

CASE NOTE

WESTERN WATER PLANNING PROCESSES: LESSONS FOR COLORADO

MEGHAN LEEMON

I. INTRODUCTION

As the demand for water outpaces a relatively stagnant supply in the United States, states, particularly in the west, are developing water plans to better prepare for their water future. The state water plans, through state water boards, establish "water policies and goals."[1] Government involvement in water law and water plans is crucial because properly completed plans help local governments better understand water as a resource and how to protect this interest.[2] In the west, Arizona, Colorado, and Washington are the only states without comprehensive water plans.[3] Although Arizona has a "water atlas," the atlas breaks down into seven distinct parts, lacking a cohesive component inherent in a comprehensive state water plan.[4]

Plans, such as those in California and Texas, note that comprehensive water plans are necessary to address the persistent drought and the pressing need to

1. CRAIG BELL & JEFF TAYLOR, WATER LAWS AND POLICIES FOR A SUSTAINABLE FUTURE: A WESTERN STATES' PERSPECTIVE 22 (2008) *available at* http://www.westgov.org/wswc/laws%20&%20policies%20report%20%28final%20with%20cover%29.pdf.

2. *See* Stephen H. Greetham, *Symposium: Oklahoma's 21st Century Water Challenges: Water Planning: An Opportunity for Managing Uncertainties at the Tribal-State Interface?*, 64 OKLA. L. REV. 593, 604-05 (2012).

3. Emily Dowd, *Conference Report: Colorado Water Congress Summer Conference 2013: Leading out Water Future*, 17 U. DENV. WATER L. REV. 156, 168 (2013).

4. *See Welcome to the Arizona Water Atlas on the Web!*, ARIZONA DEPARTMENT OF WATER RESOURCES, http://www.azwater.gov/AzDWR/StatewidePlanning/wateratlas/default.htm (last visited Apr. 21, 2014).

plan for the future.[5] Despite criticism that water plans are an "ineffective tool to link water and growth," the plans persist and appear effective in most states.[6]

Colorado is in the process of developing and drafting a cohesive attempt at a state water plan. A first draft is due to the Governor on December 10, 2014, with a final approval date of December 2015.[7] It can be argued the state's constitution's embrace of the prior appropriation doctrine[8] and the 1969 Water Right Determination and Administration Act[9] serve as a de facto state water plan. James Eklund, the Colorado Water Conservation Board ("CWCB") Executive Director, has made assurances that "Colorado's water plan must and will work with the Doctrine of Prior Appropriation."[10] This note will address water plans in California, Idaho, and Wyoming, specifically examining the processes and procedures behind each plan, and how Colorado can learn from and look to these other states for guidance.

II. PROCESS FOR ADOPTING STATE WATER PLANS

A. CALIFORNIA

California has a long history of water plans, dating back to 1919 with the Marshall Plan.[11] The Marshall Plan led to the first state-operated water project plan, the California State Water Plan ("California Plan"), published in 1930.[12] Since 1930, California has updated the California Plan numerous times, most recently with Update 2013.[13] Update 2013 had a scheduled March 2014 release date. Although the final version is not yet available,[14] three out of five Update 2013 volumes are available online via a Public Review Draft.[15]

The California Water Code ("CWC") mandates the California Plan in Section 10000 and each plan must comply with the requirements set forth in sections 10004-10013.[16] Requirements include conducting studies to determine

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5. ARNOLD SCHWARZENEGGER ET AL., CALIFORNIA WATER PLAN HIGHLIGHTS 2 (2009) *available at* http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/highlights_cwp2009_spread.pdf; *State Water Planning*, TEXAS WATER DEVELOPMENT BOARD, http://www.twdb.state.tx.us/waterplanning/swp/ (last visited Apr. 21, 2014).

6. BELL & TAYLOR *supra* note 1, at 22.

7. COLORADO'S WATER PLAN TIMELINE, http://rockies.audubon.org/sites/default/files/documents/co_water_plan_timeline_cropped_image.jpg (last visited Apr. 21, 2014).

8. COLO. CONST. art. XVI, §§ 5, 6.

9. Water Right Determination and Administration Act of 1969, COLO. REV. STAT. §§ 37-92-101 to -602 (2013).

10. Steve Porter, *Colorado Water Summit Highlight's State's Water Challenges, seeks answers through Water Plan*, INNOVATIONEWS (Mar. 4, 2014), http://innovationews.com/water/water-summit-highlights-states-water-challenges-seeks-answers-through-water-plan/.

11. *History of the California State Water Project*, DEPARTMENT OF WATER RESOURCES, http://www.water.ca.gov/swp/history.cfm (last visited Apr. 21, 2014); *Previous Reports*, CALIFORNIA WATER PLAN, http://www.waterplan.water.ca.gov/previous/index.cfm (last visited Apr. 21, 2014).

12. *History of the California State Water Project*, *supra* note 11; *Previous Reports*, *supra* note 11.

13. *Previous Reports*, *supra* note 11.

14. As of April 21, 2014.

15. *Public Review Draft*, CALIFORNIA WATER PLAN, http://www.waterplan.water.ca.gov/cwpu2013/prd/index.cfm (last visited Apr. 21, 2014).

16. WATER §§ 10000; 10004-13; EXECUTIVE SUMMARY, THE CALIFORNIA WATER PLAN:

the water amount needed to meet California's future needs as well as recommendations on how to meet the needed levels.[17] The CWC mandates the California Department of Water Resources to publish and update the California Plan every five years.[18] The Department of Water Resources must report each update component to the California Legislature "in the session in which the update plan is issued."[19] For each California Plan update, receiving broad input from Californians is a primary goal for drafters in order to be more innovative and to have a better, maintainable outcome.[20] As such, the CWC requires a preliminary draft release to all interested persons and entities in California for their review and comments.[21] Update 2013 involved extensive collaboration between the public, stakeholders, businesses, tribes, and state agencies to provide an "actionable blueprint for California's water future."[22] The CWC requires an advisory committee to assist in the updating process; all meetings with the committee must be open to the public.[23] Update 2013 does not create "mandates, prioritize actions, or allocate funding," but rather provides a roadmap to better inform legislative action and to help shape planning processes and decision making at all government levels.[24]

Update 2013 focuses on advancing integrated water management, strengthening government agency alignment, and investing in innovation and infrastructure.[25] More specifically, Update 2013 focuses on an outcome-based and goal-oriented approach through strategies and suggestions, but does not lay out specific projects.[26] By improving government agency alignment, California hopes to ensure efficient and accelerated implementation of the proposed strategies.[27] While the California Plan does not allocate funding specifically, it does mention funding and funding suggestions in a variety of ways: self-funding programs, cost-sharing programs, and public benefits programs.[28]

In addition to the California Plan, the California Governor directed the creation of a California Water Action Plan ("Action Plan") to identify key actions for California's urgent water needs.[29] The Mountain Counties Water Resources Association ("MCWRA") has both applauded and criticized the Action

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INVESTMENT IN INNOVATION AND INFRASTRUCTURE 1 (2013).

17. WATER § 10004.6 (a).

18. *Id.* § 10004(b)(1); CALIFORNIA WATER PLAN, http://www.waterplan.water.ca.gov/ (last visited Apr. 21, 2014).

19. WATER § 10004(b)(1).

20. CALIFORNIA WATER PLAN, *supra* note 18.

21. CAL. WATER CODE § 10004(b)(3).

22. EXECUTIVE SUMMARY, *supra* note 16, at 7; CALIFORNIA WATER PLAN, *supra* note 18.

23. WATER § 10004(b)(2).

24. EXECUTIVE SUMMARY, *supra* note 16, at 1.

25. EXECUTIVE SUMMARY, *supra* note 16, at 2.

26. *Id.* at 3; David Aladjem, Partner with Downey Brand LLP, Presentation on California's Water Plan, University of Denver Water Law Review Symposium (Apr. 18, 2014), *available at* http://duwaterlawreview.com/symposium-2014-2/.

27. *See* EXECUTIVE SUMMARY, *supra* note 16, at 3.

28. *Id.* at 4; Maven, *First Volume of the California Water Plan Available for Public Review*, MAVEN'S NOTEBOOK (Oct. 3, 2013), http://mavensnotebook.com/2013/10/03/first-volume-of-the-california-water-plan-available-for-public-review/.

29. CALIFORNIA WATER ACTION PLAN, http://resources.ca.gov/california_water_action_plan/ (last visited Apr. 21, 2014).

Plan. The MCWRA applauds the plan as being a "coordinated, comprehensive plan for addressing the statewide water challenges."[30] However, the MCWRA criticized the plan because it does not integrate the Sierra Nevada headwaters, where most of the state's drinking water supply comes from, to the degree the MCWRA would have hoped.[31] No state water plans are perfect, and California is no exception. David Aladjem, an attorney and partner at one of California's most successful water firms, criticized the new, comprehensive California Plan as no longer being a central guiding document, but instead describes it as "peripheral."[32] In addition to the California Plan, California also has various other regional "water plans," such as the Bay Delta Conservation Plan[33] and the Central Valley Project.[34] The Central Valley Project, a water conservation project consisting of dams, reservoirs, power plants, and canals, reaching roughly nine million acre-feet of water, is a federal project overseen by the United States Bureau of Reclamation.[35] Balancing these various plans poses a significant challenge for California.

Overall, California still has a comprehensive water plan that helps guide water use in one of the nation's largest and most populous states. California has a long history in water planning and has learned from their past mistakes. Other states can look to California to help guide their own water planning process. California recognizes that water supply is ever changing and the need for a new plan every five years is essential in providing for several decades to come.[36] Other states should look at the flexible nature of the California Plan and consider requiring a similar update schedule, to allow time to see what is and is not working, while still aiming for the long-term relevance of the plan.

B. IDAHO

Idaho adopted its first State Water Plan ("Idaho Plan") in 1974, with updates occurring every two to four years until 1996.[37] Idaho did not update its water plan again until 2012, when the 1996 Idaho Plan was becoming outdated and in need of improvement.[38] Idaho also has ten individual basin plans; each basin updates its plan more frequently than the comprehensive Idaho Plan.[39]

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30. *California Water Action Plan*, MOUNTAIN COUNTIES WATER RESOURCES ASSOCIATION (Nov. 24, 2013), http://mountaincountieswater.com/2013/11/california-water-action-plan-public-review-draft-mcwra-comments/.

31. *Id.*

32. Aladjem, *supra* note 26.

33. BAY DELTA CONSERVATION PLAN, http://baydeltaconservationplan.com/Home.aspx (last visited May 11, 2014).

34. 16 U.S.C.S. §695d (LexisNexis 2014).

35. CENTRAL VALLEY PROJECT, http://www.usbr.gov/projects/Project.jsp?proj_Name=Central+Valley+Project (last visited May 11, 2014).

36. CALIFORNIA WATER PLAN, *supra* note 18.

37. *State Water Plan*, IDAHO WATER RESOURCE BOARD, http://www.idwr.idaho.gov/waterboard/WaterPlanning/Statewaterplanning/State_Planning.htm (last visited Apr. 21, 2014).

38. *Id.; See also* Kimberlee Kruesi, *A New Plan for Idaho's Water*, MAGIC VALLEY (July 20, 2012, 2:10 AM), http://magicvalley.com/news/local/a-new-plan-for-idaho-s-water/article_ea7c6244-d228-11e1-9d9b-001a4bcf887a.html.

39. *See Comprehensive Basin Planning*, IDAHO WATER RESOURCE BOARD, http://www.idwr.idaho.gov/waterboard/WaterPlanning/CompBasinPlanning/Comp_Basin_Plans.htm (last visited Apr. 21, 2014).

The Idaho Constitution provides the discretionary authority to prepare a state water plan through a mandated "Water Resource Agency;" unlike California, Idaho law does not mandate a water plan.[40]

Creating the Idaho Plan is a five-step process, beginning with a comprehensive public involvement program and ending with Idaho Legislature approval.[41] With extensive public input, the 2012 Idaho Plan went into effect on March 8, 2013.[42] Under Idaho law, the Idaho Legislature receives the Water Plan on the first session day, and if no legislative changes are made within sixty-days, then the plan, as written, becomes effective.[43]

The Idaho Water Resource Board ("IWRB") develops the Idaho Plan.[44] The Idaho Plan has two primary components: (i) addressing statewide policies, goals, and objectives, and (ii) addressing individual basin plans.[45] Similar to California, Idaho drafted the plan with public input; the IWRB held seven public hearings across the state, where the public submitted written comments and exhibits to the IWRB for consideration.[46] Forty-seven constituents, including individual state residents and various environmental group representatives, provided either written or oral testimony to the IWRB during the public comment period.[47]

Similar to California, the Idaho Plan involves many suggestions, but no mandates or regulations.[48] IWRB Chairman Roger Chase said that by creating a voluntary water plan, Idaho has "one of the most successful salmon recovery programs in the nation."[49] For the first time, the 2012 Idaho Plan "includes implementation strategies and milestones" to guide the execution of such policies.[50] Strategies include authorizing legal action to protect Idaho's sovereignty over its water and cooperating with state agencies, neighboring states, the federal government, and Indian tribes.[51] The Idaho Plan both explains the past and provides a forward path.[52] The Idaho Plan lists five main objectives for the new

40. IDAHO CONST. art. XV, § 7.

41. IDAHO WATER RESOURCE BOARD, IDAHO STATE WATER PLAN 5 (2012).

42. *See* Aaron Kunz, *Idaho's New State Water Plan Adopted without Legislative Approval*, OPB (Mar. 7, 2013), http://earthfix.opb.org/water/article/idahos-new-state-water-plan-adopted-without-legisl/.

43. IDAHO CONST. art. XV, § 7.

44. *Comprehensive State Water Planning*, IDAHO WATER RESOURCE BOARD, http://www.idwr.idaho.gov/waterboard/WaterPlanning/comprehensive%20planning.htm (last visited Apr. 21, 2014).

45. DAVID R. TUTHILL, JR., ET AL., THE WATER REPORT 4 (2013), *available at* http://www.cwi.colostate.edu/southplatte/files/Conjunctive%20Management%20in%20Idaho—The%20Water%20Report.pdf.

46. *See Background Information on Revision Process*, IDAHO WATER RESOURCE BOARD, http://www.idwr.idaho.gov/waterboard/WaterPlanning/StateWaterPlanning/Background_info.htm (last visited Apr. 21, 2014).

47. *See id.*; *see also Public Testimony & Written Comments Received by IWRB*, IDAHO WATER RESOURCE BOARD, http://www.idwr.idaho.gov/waterboard/WaterPlanning/StateWaterPlanning/PDFs/Public%20Comment%20Summary%20Table.pdf (last visited Apr. 21, 2014).

48. *See* Kunz, *supra* note 42.

49. *Id.*

50. IDAHO STATE WATER PLAN, *supra* note 41, at iv.

51. *Id.* at 8.

52. Clive Strong, Chief of the Natural Resources Division of the Office of the Attorney General of the State of Idaho, Presentation on Idaho's Water Plan, University of Denver Water Law

plan to accomplish: water management, public interest, economic development, environmental quality, and public safety.[53]

The new Idaho Plan addresses concerns about salmon recovery, wetlands, and climate variability.[54] Although the Idaho Plan focuses extensively on climate variability, the legislature apparently originally planned to remove the concept. The House Resources and Conservation Committee attempted to rewrite the plan halfway through the sixty-day legislative period by removing every mention of climate change and most mentions of riparian and wetland habitats and protecting endangered species.[55] Because the proposed changes were too late and there was insufficient time to have the House and the Senate pass the changes, the 2012 Idaho Plan went into effect as originally written and proposed to the Idaho Legislature, including the IWRB focus on climate variability.[56]

Like all other water plans, organizations and the legislature have criticized the Idaho Plan. The Kootenai Environmental Alliance praises the Idaho Plan as recognizing many beneficial water uses and the need to protect those uses, yet also notes that the plan is "overly reliant on the construction of dams to meet future water needs."[57] Dam construction is "expensive, damaging to the environment, and provides no guarantee of additional water."[58] Prior to enactment, the Idaho Conservation League prompted Idaho citizens to inform the IWRB that clean water and water conservation should be a priority.[59]

Idaho has certainly come far since 1996, but they have a ways to go before all can accept or even tolerate their water plan. Clive Strong, the Natural Resources Division Chief of the Idaho Attorney General's Office, praises the plan as contemplating and providing for change.[60] However, there has already been talk about revising the plan despite its recent enactment.[61] IWRB Chairman Roger Chase called the Idaho Plan a "living document" and is open to future changes.[62] Only time will tell in Idaho whether the more effective method is one comprehensive plan, individual basin plans, or possibly a combination. Either way, the IWRB should be, and fortunately is, open to suggestions.

Review Symposium (Apr. 18, 2014).

53. IDAHO STATE WATER PLAN, *supra* note 41, at 6, *available at* http://duwaterlawreview.com/symposium-2014-2/.

54. Kunz, *supra* note 46.

55. Chris Jones, *Water Plan Hits Choppy Waters*, IDAHO COUNCIL OF TROUT UNLIMITED (Mar. 4, 2013), http://idahotrout.org/2013/03/04/water-plan-hits-choppy-waters/; Marie Kellner, *Climate Change? Real? Legislature Seems to think Not*, IDAHO CONSERVATION LEAGUE (Mar. 1, 2013, 4:10 PM), http://www.idahoconservation.org/blog/2013-blog-archive/climate-change-real-legislature-seems-to-think-not.

56. *See* Kunz, *supra* note 42.

57. *Idaho State Water Plan Revisions under Consideration*, KOOTENAI ENVIRONMENTAL ALLIANCE (Sept. 11, 2012, 2:00 PM), http://kealliance.org/2012/09/11/idaho-state-water-plan-revisions-under-consideration/.

58. *Id.*

59. Marie Kellner, *Speak up for Smart use of Idaho's Water!*, IDAHO CONSERVATION LEAGUE (Aug. 27, 2012, 4:00 PM), http://www.idahoconservation.org/blog/2012-blog-archive/swp/?searchterm=water%20plan.

60. Clive Strong, *supra* note 52.

61. *See* Kunz, *supra* note 42.

62. *See* Rocky Barker, *Idaho State Water Plan gets Strong Support from Resources Committee*, IDAHO STATESMAN (Mar. 7, 2013), http://blogs.idahostatesman.com/idaho-state-water-plan-get-strong-support-from-resources-committee/.

C. WYOMING

Wyoming published its first comprehensive water plan in 1973, and did not update the plan until 2007, thirty-four years later.[63] Both the updated 2007 Wyoming Plan and the 1973 Plan consisted of an overall, comprehensive framework as well as an emphasis on the seven individual basins.[64] Similar to Idaho, there is no requirement to update the plan at a given interval. Wyoming decided that a new Wyoming Framework Water Plan ("Wyoming Plan") was necessary in 2007 due to technological advances and changing political and regulatory conditions.[65] The 2007 Wyoming Plan has two objectives and has two volumes to reflect each objective: Volume I is a summary of the state's water uses, projected future needs, and alternative ways to meet the future needs; Volume II provides future water planning and direction to Wyoming.[66]

In 1997, the Wyoming Legislature directed the Wyoming Water Development Commission ("WWDC") to "conduct a water planning feasibility study" with the University of Wyoming.[67] The legislature created the WWDC in 1979, and mandated that it consist of ten members, appointed by the Governor and approved by the Senate, responsible for the "coordination, development and planning of Wyoming's water and related land resources."[68] The 1997 WWDC study led to the creation of seven individual basin plans, with the last one completed in May 2006.[69] In 2005, the legislature authorized funding for a comprehensive state water plan.[70]

The 1973 Framework Plan is still a valuable reference for Wyoming's policy makers and water resources managers.[71] Steve Wolff, the Colorado River Coordinator for the Wyoming State Engineer's Office, noted that the 2007 Plan involved virtually no real planning, but simply updated the 1973 Plan.[72] The current 2007 Wyoming Plan provides information based on a thirty-year planning horizon.[73] Although Wyoming has updated some of the individual basin plans since their initial reports, the state has not updated the Wyoming Plan since the 2007 enactment.[74] Wyoming has not updated three out of the seven

63. *History of the State Water Planning Process*, WYOMING STATE WATER PLAN, http://waterplan.state.wy.us/history.html (last visited Apr. 21, 2014); *Statewide Framework Water Plan*, Wyoming State Water Plan, http://waterplan.state.wy.us/frameworkplan.html (last visited Apr. 21, 2014).

64. *History of the State Water Planning Process*, *supra* note 63.

65. WWC ENGINEERING ET AL., THE WYOMING FRAMEWORK WATER PLAN: A SUMMARY 1 (2007).

66. *Id.*

67. *Summary of the State Water Planning Process*, WYOMING STATE WATER PLAN, http://waterplan.state.wy.us/ (last visited Apr. 21, 2014).

68. *History of the State Water Planning Process*, *supra* note 63; *Directory*, WYOMING STATE WATER PLAN, http://wwdc.state.wy.us/directory/directory.html (last visited Apr. 21, 2014).

69. WYOMING WATER DEVELOPMENT COMMISSION, WYOMING FRAMEWORK WATER PLAN VOLUME I § 1.3 (2007).

70. *Summary of the State Water Planning Process*, *supra* note 67.

71. *History of the State Water Planning Process*, *supra* note 63.

72. Steve Wolff, Colorado River Coordinator for the Wyoming State Engineer's Office, Presentation on Wyoming's Water Plan, University of Denver Water Law Review Symposium (Apr. 18, 2014), *available at* http://duwaterlawreview.com/symposium-2014-2/.

73. THE WYOMING FRAMEWORK WATER PLAN, *supra* note 65, at 1.

74. *See River Basin Plans*, WYOMING STATE WATER PLAN, http://waterplan.state.wy.us/basins/7basins.html (last visited Apr. 21, 2014).

individual basin plans since the initial reports, while the state has updated others as recently as 2013, 2011, and 2010.[75] The Snake Salt River Basin Groundwater Update is currently in progress.[76]

Although the Wyoming Plan provides for thirty years, Wyoming officials are realizing that the comprehensive plan is lacking in critical areas, such as drought planning. Governor Matt Mead is taking Wyoming's water future into his own hands and moving the state towards a new, more comprehensive water strategy lead.[77] The Governor's new "Wyoming Water Strategy"[78] will take an "overarching look"[79] at Wyoming water use and appears to be completely separate from the Wyoming Plan; the name is not consistent with previous Framework Water Plans and the WWDC's website has no information about a new strategy or plan.[80] Steve Wolff confirmed the division and further noted that those involved with the Wyoming Plan were completely unaware of the water strategy until the public announcement.[81]

The new strategy will "encompass water quality, water law and water infrastructure, all of which are traditionally overseen by separate state agencies."[82] Governor Mead has a 200-page in house document that is a "water catalog of issues"; the issues "deal with water quality, water quantity, interactions and beneficial uses."[83] Beginning in November 2013, Governor Mead held nine listening sessions to better learn how to best use Wyoming's most valuable resource-water.[84] To increase public involvement and in hopes of hearing new ideas and insight, the Governor asked those involved with the Wyoming Plan to stay away from the sessions.[85]

One of Governor Mead's policy advisors notes that Governor Mead wants to create a strategy that will benefit all Wyoming citizens, specifically through baseline water testing and evaluating water quality, something that probably should have already been done.[86] Governor Mead's Natural Resource Policy Advisor notes that the Governor's primary concern is to "ensure [that] we are protecting watersheds and groundwater."[87] Wyoming is recognizing the harsh reality of water scarcity and the increasing consistency of dry years. The state,

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75. *See id.*

76. *See Summary of the State Water Planning Process*, *supra* note 67.

77. *See id.*

78. Press Release, Governor Seeks input on Wyoming Water Strategy, Office of Governor Matt Mead (Nov. 1, 2013), *available at* http://governor.wy.gov/media/pressReleases/Pages/GovernorSeeksInputonWyomingWaterStrategy.aspx.

79. Benjamin Storrow, *Water plan is a Wyoming-wide 'priority'*, CASPER STAR TRIBUNE (Nov. 6, 2013), http://trib.com/business/energy/water-plan-is-a-wyoming-wide-priority/article_d01be756-924c-59f5-a526-fcdab1c52c7d.html.

80. *See generally* WYOMING WATER DEVELOPMENT COMMISSION, http://wwdc.state.wy.us/wwdc.html (last visited Apr. 21, 2014).

81. Interview with Steve Wolff, Colorado River Coordinator for the Wyoming State Engineer's Office, in Denver, Colo. (Apr. 18, 2014).

82. Storrow, *supra* note 79.

83. Saige Albert, *Wyoming Governor's Office Introduces Plan to Develop new Water Strategy*, WYOMING LIVESTOCK ROUNDUP (July 20, 2013), http://www.wylr.net/the-roundup/archives/186-water/4307-wyoming-governor-s-office-introduces-plan-to-develop-new-water-strategy.

84. Press Release, *supra* note 78.

85. Interview with Steve Wolff, *supra* note 81.

86. Albert, *supra* note 83.

87. *Id.*

specifically Governor Mead, is taking steps towards planning for its water future more appropriately and cohesively than in the past. Wolff hopes that the Wyoming Plan and the Water Strategy will be able to merge and provide Wyoming with an even better water plan.[88] Wyoming appears to be taking a more comprehensive approach, like California, rather than a decentralized approach encompassing individual basin plans without cohesively combining them, which they previously relied on with the two Framework Water Plans.

D. COLORADO

Colorado, like many other states with water plans, is realizing the necessity for a State Water Plan in hopes of a secure water future. With the Colorado population expected to nearly double by 2050, the current water supply cannot keep up.[89] CWCB Executive Director James Eklund opined that without a comprehensive plan, there will be an even greater supply and demand gap in all Colorado basins than what Colorado is currently experiencing.[90] Until recently, a comprehensive water plan was not considered feasible, but now Colorado knows enough to develop such a plan.[91]

In May 2013, Governor John W. Hickenlooper ordered the CWCB to commence work on Colorado's Water Plan ("Colorado Plan").[92] As stated in the Governor's Executive Order, a Water Plan is necessary to address the water demand and supply gap, Colorado's drought, and purchasing and transferring water rights.[93] The plan, overseen by the CWCB and Mr. Eklund,[94] is meant to be a grassroots effort, building upon eight years of work and 780 meetings around Colorado[95] by Colorado's Basin Roundtables, the Interbasin Compact Committee, and the CWCB.[96] The Statewide Water Supply Initiative ("SWSI") provided the Colorado Plan's foundation by providing the technical foundation describing Colorado's water challenges.[97] Updates to the SWSI will continue to provide a foundation for individual basin plans and the Colorado Plan.[98] SWSI Update 2016 is currently developing.[99]

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88. Interview with Steve Wolff, *supra* note 81.

89. Marci Krivonen, *Local Conservation Group Gets Involved with Colorado Water Plan*, ASPEN PUBLIC RADIO (Jan. 30, 2014, 8:49 AM), http://aspenpublicradio.org/post/local-conservation-group-gets-involved-colorado-water-plan.

90. James Eklund, Executive Director of the CWCB, Opening Presentation at the University of Denver Water Law Review Symposium: Goals for Colorado's Water Plan: An Overview (Apr. 18, 2014), *available at* http://duwaterlawreview.com/symposium-2014-2/.

91. THE COLORADO WATER PLAN, EAGLE RIVER WATERSHED COUNCIL 1, *available at* http://www.erwc.org/pdf/colorado-water-plan-fact-sheet.pdf.

92. Colo. Exec. Order D 2013-005 (May 14, 2013).

93. Executive Order, *supra* note 92, at 2.

94. Joe Rubino, *Hickenlooper Legal Advisor James Eklund named Director of Colorado Water Conservation Board*, DAILY CAMERA (June 13, 2013), http://www.dailycamera.com/state-west-news/ci_23455302/hickenlooper-legal-adviser-james-eklund-named-director-colorado.

95. Eklund, *supra* note 90.

96. THE COLORADO WATER PLAN, *supra* note 91, at 1.

97. *Frequently Asked Questions*, COLORADO'S WATER PLAN, http://coloradowaterplan.com/ (last visited Apr. 21, 2014).

98. *See id.*

99. Rebecca Mitchell, CWCB Water Supply Planning Section Chief, Update on the SWSI, Presentation at the University of Denver Water Law Review Symposium (Apr. 18, 2014), *available at* http://duwaterlawreview.com/symposium-2014-2/.

Like Wyoming, Colorado will have individual basin plans as well as a comprehensive Water Plan.[100] However, "Colorado will be one of the first states in the country to incorporate grassroots scenario planning and adaptive management into water planning efforts."[101] Especially given the September 2013 floods, the Plan will prepare for climactic variability by examining water needs for both wetter and drier scenarios.[102] The schedule requires the CWCB present a draft of the Colorado Plan to the Colorado Governor by December 10, 2014 and a finalized draft by December 2015.[103] Consistent with the trend towards frequent updating, the Colorado Plan will be a "dynamic document amended every two to five years."[104] Linda Bassi, CWCB's Stream and Lake Protection Section Chief, noted that the Colorado Plan will not be overly specific or detailed, but rather drafted to allow flexibility.[105]

Similar to most other states, the Colorado Plan "must reflect the values and priorities of Coloradoans."[106] The public is able to get involved through local Basin Roundtables, CWCB meetings, emails, an online input form, or on the social networking sites Facebook and Twitter.[107] The Twitter page notes that the Colorado Plan is the first water plan "written by Coloradoans, for Coloradoans."[108]

While this all sounds worthy of broad support, some of the members of the Colorado Legislature have received the Executive Order with hesitation. In particular, Senator Gail Schwartz co-sponsored a bill, SB 14-115, that would require the Colorado Legislature to approve the statewide water plan, thereby trumping the Executive Order.[109] As written, the Executive Order hardly mentions the legislature and instead focuses on a collaborative effort between the CWCB and the governor's office for the Plan's development.[110] Opposing the bill, Louis Meyer, who serves on the Colorado roundtable, notes that the current method, which Governor Hickenlooper developed, involves those in the Colorado community who would not otherwise "have a voice in the plan."[111] Meyer further notes that if the grassroots efforts are "overruled by a top-down approach, [it] will lead to cynicism and lack of engagement" by those who do not typically speak up, particularly those from smaller towns from Granby to Grand Junction.[112] Mike King, the executive director of the Colorado Department of Natural Resources, agrees that Colorado "need[s] to depoliticize the

100. *See* THE COLORADO WATER PLAN, *supra* note 91 at 2.

101. *Frequently Asked Questions*, *supra* note 97.

102. *Id.*

103. Eklund, *supra* note 90.

104. Dowd, *supra* note 3, at 168.

105. Linda Bassi, CWCB Stream and Lake Protection Section Chief, Presentation at the University of Denver Water Law Review Symposium (Apr. 18, 2014), *available at* http://duwaterlawreview.com/symposium-2014-2/.

106. *Frequently Asked Questions*, *supra* note 97.

107. *See id.*

108. TWITTER: COLORADO WATER PLAN, https://twitter.com/COWaterPlan (last visited Apr. 21, 2014).

109. Brent Gardner-Smith, *Schwartz Sponsors Bill to Challenge Water Plan*, ASPEN DAILY NEWS (Feb. 8, 2014), http://www.aspendailynews.com/section/home/161179.

110. *See id.*

111. *Id.*

112. *Id.*

development of Colorado's water" and that the Colorado Plan should be "organic" and not subject to political pressures.[113] SB 14-115 was eventually amended in subcommittee, setting forth additional requirements for public hearings and defining a greater role for the legislature, particularly the Water Resources Review Committee, but stopping short of requiring legislative approval of the plan.[114] The Governor signed the bill into law on May 15, 2014.[115]

While many understand the need for a comprehensive water plan in Colorado, there is uncertainty as to the correct planning process and the effect that the Colorado Plan could have on the state's water courts and prior appropriation system[116] Other states vary in their water plan creation; there is no one right answer. However, because water's future is ever-changing, state water plans need to be flexible to change and updated frequently. Most states strongly emphasize public input, and Colorado appears to be doing that on a larger scale than any other state. Colorado is taking a step in the right direction and can look to other states for guidance.

III. ANALYSIS

Looking at the three water plans discussed here, a general theme is the importance of public involvement with those heading the various plans, specifically through constituent meetings. While some states provide public involvement platforms and others just allow for it, the agency writing the plan should always include public involvement in some way. Each state water plan is overseen by some state-created water board, and Colorado has followed suit with the CWCB.

Where states differ is when it comes to either a more comprehensive or decentralized plan and more specifically what should be included in each plan. California prefers a comprehensive plan, although this is up for debate[117], while Idaho and Wyoming have both individual basin plans and a comprehensive state plan. This is most prevalent in Wyoming, yet the unsuccessful plan has led the Wyoming Governor to begin creating a comprehensive water strategy without WWDC's input, which would combine water issues presently overseen by separate state agencies. Both the Colorado and Wyoming Governors have taken a large role in water plan development. Colorado has adopted both approaches; each Basin Roundtable develops its own Basin Implementation Plan in addition to the comprehensive Colorado Plan, similar to Idaho. However, there appears to be a greater emphasis on comprehensive planning in Colorado.

Additionally, the California Plan discusses the public trust doctrine and one of Idaho's Plan's goals is public interest. However, public interest has been

113. *Id.*

114. COLORADO WATER CONGRESS, STATE AFFAIRS WATER BILL SUMMARY (May 7, 2014), *available at* http://www.cowatercongress.org/external/wcpages/wcmedia/documents/State%20Affairs/CWC%20Bill%20Summaries.pdf?id. . .A-74A14B2EE6A2.

115. SB 14-115, OPEN:STATES, http://openstates.org/co/bills/2014A/SB14-115/ (last visited May 27, 2014).

116. *See* email from Matthew Merrill, Partner, White & Jankowski, LLP, to author (Apr. 29, 2014, 17:24 MDT)(on file with *Water Law Review*).

117. *See* Aladjem, *supra* note 26 (noting that California is moving away from a centralized approach).

rejected by the Colorado Supreme Court because it is in conflict with the prior appropriation doctrine.[118] Conversely, California specifically held, more than ten years prior to the Colorado decision, that although the public trust doctrine and the prior appropriation doctrine were at one point separate doctrines, the two need to be integrated together to take a better look at water resources.[119] This exemplifies how a state's water rights foundation and viewpoint influences the water planning process; each state needs an individualized approach, based on their already established water law principles, to best determine what works in their own state.

Colorado has also taken an innovative approach with its grassroots efforts and decreased legislative involvement. From the beginning, Governor Hickenlooper's Executive Order to create a water plan varies from what most other states have done, with Wyoming being the exception. States vary in the degree to which the legislatures are involved; the CWC mandated the California Plan, the Idaho Plan is simply an option under the Idaho Constitution, and the Wyoming legislature authorized the plan, but neither state law nor code requires the plan. A mandated water plan may not be necessary, depending on the individual state, but the option to have one, either through a state statute or through a governor, is essential. For a state like Colorado, where water is such a scarce yet vital resource, a mandated plan may be the best option, at least until Colorado can better address the scarcity and supply and demand gap.

However, not all agree that a comprehensive Colorado Plan is necessary. Sarah Klahn, Managing Partner with White & Jankowski, L.L.P., a water law firm in Denver, Colorado, does not believe that now is the right time for a comprehensive plan.[120] Klahn prefers the local, roundtable process.[121] Klahn voiced her concern that once enacted, the Colorado Plan will not be a governing document, as she is unaware of any judicial decisions where a provision of a state water plan affected the outcome.[122] Klahn struggles with converting the roundtables to a state level while also protecting local interests.[123] Hopefully, Colorado will be successful in developing a plan that protects local and state interests.

As there is no one right process, it would be well worth it to see what success the grassroots Colorado Plan could have. If the decreased legislative involvement does not appear to be successful after the recommended two-to-five year update period, then the legislature should revisit something similar to the original content of SB 14-115. For now, especially with the draft deadline approaching in December 2014, if the bill passes, it could certainly delay the enactment and thereby create unwanted, further uncertainty for Colorado's water future.

118. *See* Bd. of Cnty. Comm'rs v. United States, 891 P.2d 952, 972 (Colo. 1995).

119. *See* Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 732 (Cal. 1983).

120. Sarah Klahn, Managing Partner with White & Jankowski, L.L.P., University of Denver Water Law Review Symposium: Providing a Colorado-based perspective on the New Plan (Apr. 18, 2014).

121. *Id.*

122. *Id.*

123. *Id.*

IV. CONCLUSION

States have various methods to create a State Water Plan, but one thing is clear: most western states have a comprehensive plan. Colorado, like other states, is realizing the need to better prepare for its water future. Because water is so unpredictable, any degree of predictability gained through a state plan is better than not having a plan. Colorado can look to California to better understand how to formulate a comprehensive plan and to Wyoming to better understand why a decentralized plan may not be the best option. Putting the State Water Plan in the governor's hands may be a successful technique. Idaho seems to be a combination of California and Wyoming, and Colorado's Plan will focus on climate variability, like Idaho. The Idaho Legislature unsuccessfully attempted to remove every mention of climate variability in Idaho's Plan, yet it seems that climate variability is exactly what a water plan should prepare for: the ever-changing water availability.

Colorado needs to prepare for any situation that may arise, including drought, wildfire, and flooding. Those in charge of creating the Colorado Plan are very passionate about their efforts and hopefully it will pay off. Only time will tell, but Colorado appears to have a good foundation.

CONFERENCE REPORTS

UNIVERSITY OF DENVER WATER LAW REVIEW SEVENTH ANNUAL SYMPOSIUM: PREPARE. PROTECT. PRIORITIZE. EXPLORING COLORADO'S NEW WATER PLAN

Denver, CO April 18, 2014

GOALS FOR COLORADO'S WATER PLAN: AN OVERVIEW

James Eklund, the Executive Director of the Colorado Water Conservation Board ("CWCB"), which is in charge of drafting Colorado's new Water Plan, launched his presentation by pointing out the history of "creative tension" that exists between Colorado's eastern and western slopes regarding water use. He noted that this tension originates from the fact that 80 percent of the water is on the western slope, although 87 percent of the state population resides on the eastern slope. Eklund explained that forecasts predict Colorado's population will reach ten million by 2060. The snowpack's constant or below average yield, coupled with Lake Powell's recent all-time lows, mean Colorado must plan diligently for its future water use. Eklund pointed out that the CWCB has facilitated more than 780 statewide meetings as an essential part of the effort to address the widening gap between supply and demand.

Eklund commended the doctrine of prior appropriation for its adaptability and its resiliency in the face of constantly changing circumstances, from economic growth to recession. He noted that prior appropriation is not a stale doctrine, but, rather, it has allowed Colorado to advance and protect water uses of all kind. Eklund also emphasized that even though the doctrine is not the cutting edge of water planning, it nonetheless helps Colorado engage in the interstate water rights discussion.

Next, Eklund pointed out that Colorado's future depends on affirmative action such as Colorado's Water Plan ("Water Plan"), which Governor John Hickenlooper's executive order put into motion in 2013. Eklund also identified the Water Plan's values, which include vibrant sustainable urban landscapes, healthier water and environment, and robust recreation and tourism, as well as viable and productive agriculture. He noted that the CWCB does not limit the Water Plan to Denver, but that the plan is a statewide collaborative effort between the state's seven river basins seeking to build consensus.

Eklund next described the Water Plan's goals. The Water Plan will address the challenge of closing the gap between supply and demand, and aims to protect, preserve, and enhance the state's rivers. Additionally, the Water Plan will formulate alternatives to buy and dry so as to align state efforts and water dollars. Finally, Eklund emphasized the Water Plan's goal of incentivizing a quicker federal regulatory process by creating a procedure that meets all required elements, has state endorsement, and allows the state to

prioritize its water resources.

Eklund commented on the Water Plan's expeditious process, which started in 2013 and is due at the Governor's desk in December 2014. He explained that the CWCB is closely following every water issue discussion in the state in order to make the process as inclusive as possible. The process includes basin roundtables, grassroots discussions that inform basin implementation plans across the state. The basin implementation plans will, in turn, inform the drafting of the Water Plan. Eklund stated that once the CWCB submits the first version of the Water Plan, the CWCB will engage the state as whole in order to further refine and improve the Water Plan.

Eklund finished his presentation by reminding the audience that planning for future water use was an obligation of the state. He called on those present to engage in the process in order to help the CWCB "get it right."

Edgar Barraza

EXPLORING COLORADO'S NEW WATER PLAN, FEATURING REPRESENTATIVES FROM THE COLORADO WATER CONSERVATION BOARD

Addressing potentially the most important contemporary water issue in the state, the University of Denver Water Law Review Annual Symposium focused on the Colorado Water Plan ("Colorado Plan"). The Symposium began with a panel discussion featuring members of the Colorado Water Conservation Board ("CWCB"). The discussion focused on three particular areas: (i) the role the Statewide Water Supply Initiative ("SWSI") will play in the new Colorado Plan; (ii) how the Colorado Plan will address the many issues surrounding the Colorado River; and (iii) an overview of how the environment and recreation fit into the Colorado Plan. Working in concert, these topics help to better illuminate the work the CWCB is undertaking to complete the Colorado Plan.

The first panelist, Rebecca Mitchell, the Water Supply Planning Section Chief at the CWCB, detailed the role SWSI would play in the final version of the Colorado Plan. Completed in 2010, SWSI was a technical analysis of Colorado's water issues. It addressed demands for water in the state, supplies of water in the state, the gaps between supply and demand, and potential solutions to those gaps. The CWCB is currently updating the SWSI to coincide with the Colorado Plan. The update will establish a narrative-driven approach while incorporating new planning methods and measures that will assess the uncertain nature of future conditions.

Mitchell then transitioned to discussing how the CWCB will incorporate the SWSI into the Basin Roundtables ("BRTs"), which Mitchell explained are key components in developing the Colorado Plan. The Water For The Twenty-First Century Act, which the Colorado General Assembly passed in 2005, created the nine BRTs across Colorado to provide local, collaborative forums for stakeholders. Each of these BRTs is developing a Basin Implementation Plan designed to address the water supply gaps in the region. Mitchell explained that the CWCB will develop these Basin Implementation Plans in coordination with the updated SWSI. From there, the BRTs will send the Basin Implementation Plans to the CWCB, which will then incorporate

elements of the plans into the Colorado Plan. Through this process SWSI will flow through the BRTs, allowing the various stakeholders across the state to provide input before the Colorado Plan adopts the nine BRTs' recommendations.

Next, Ted Kowalski, the Interstate, Federal & Water Information Section Chief at the CWCB, explored the difficulties surrounding the Colorado Plan and the Colorado River Basin in particular. The Colorado River presents unique challenges for the CWCB because it impacts seven of the nine BRTs and is the subject of interstate compacts. Due to these difficulties, the Colorado Plan will build upon a number of interstate efforts to create a manageable and effective plan around the Colorado River.

As Kowalski explained, the Colorado Plan will draw from the Colorado River Basin Study, which analyzed strategies to mitigate supply and demand imbalances through 2060. This study, conducted by the Bureau of Reclamation's Upper Colorado and Lower Colorado Regions in 2010, proposed a number of potential solutions to the large supply and demand gap that exists on the Colorado River and explained that no one alteration would completely mitigate the problem. The Colorado Plan will also incorporate aspects of Upper Colorado River Basin Compliance Planning initiatives, which explore strategies upper basin states may utilize to increase the likelihood of compact compliance.

Additionally, the Colorado Plan will incorporate ideas and data from the Water Bank Working Group. The Water Bank Working Group is currently working with Colorado State University on a multi-year study to assess deficit irrigation in western Colorado. This analysis will help the CWCB to create a water plan that minimizes the potential of violating interstate compacts. Additionally, the CWCB will use the Colorado River Water Availability Study ("CRWAS") to provide technical data for the BRTs. CWCB is utilizing CRWAS to understand historic hydrology and extrapolate that data to explore what effect climate change could have on water hydrology. Kowalski stressed that while this is not an exhaustive list of all of the inputs the CWCB will analyze in ensuring the Colorado Plan is workable and efficient for the Colorado River Basin, it certainly shows how important the basin is to the CWCB.

Finally, Linda Bassi, the Stream and Lake Protection Section Chief at the CWCB, provided an overview of how the Colorado Plan will address environmental and recreational concerns. Of the four broad goals the CWCB outlined at the inception of the drafting phase of the Colorado Plan, two pertained to ensuring a healthy environment and expanding the recreation and tourism economies. In an attempt to meet these goals, the CWCB mandated that each BRT conduct a Nonconsumptive Needs Assessment. The first phase of the Nonconsumptive Needs Assessment included a stakeholder-focused mapping effort designed to indicate where important environmental and recreational attributes exist in each basin. The second phase identified projects and methods that each basin can utilize to ensure that these attributes receive an adequate nonconsumptive water supply.

The CWCB's goal is to have the BRTs incorporate the ideas expressed in the Nonconsumptive Needs Assessments into their Basin Implementation Plans. To assist basin stakeholders, the CWCB created a compilation of information designed to illuminate the various projects and methods available

to meet each basin's nonconsumptive needs. Bassi referred to this compilation as the "Nonconsumptive Toolbox." One tool that the CWCB is employing is the Nonconsumptive Gap Analysis, which will help the BRTs identify gaps in the protection of environmental and recreational attributes by illuminating which areas in a given basin are at risk. Bassi also explained that the Nonconsumptive Gap Analysis organizes existing protection measures for environmental and recreational areas into quantifiable data sets, which encourages the BRTs to identify long-term goals and outcomes for those areas.

Overall, Mitchell, Kowalski, and Bassi provided a helpful overview of the CWCB's approach to the Colorado Plan. All three speakers stressed the importance of allowing Coloradoans to have a voice in the Colorado Plan—whether through the BRT's or by contacting the CWCB directly. It may be unclear what the next chapter of Colorado water planning will be, but whatever it is, each speaker on the panel was confident that the Colorado Plan would certainly play an important role.

Matt Freemann

COLORADO'S BASIN ROUNDTABLES - PERSPECTIVES FROM AROUND THE STATE

The University of Denver Water Law Review held its Seventh Annual Symposium on April 18. The title of the second panel of the morning was "Colorado's Basin Roundtables - Perspectives from Around the State." Star Waring, natural resources and water law attorney at Dietz & Davis, P.C. and adjunct professor of water law at the University of Denver Sturm College of Law, moderated the four-person panel. The discussion focused on the importance of open communication and mutual understanding between representatives from each of Colorado's nine basin roundtables. The panelists included Marc Waage, Denver City and County Representative for the Metro Basin Roundtable; Gary Barber, Chair of the Arkansas Basin Roundtable; Ken Neubecker, Environmental Representative of the Colorado Basin Roundtable; and Sean Cronin, Chair of the South Platte Basin Roundtable. The Four panelists presented a range of perspectives that highlighted the diversity of concerns for Colorado's various water interests, as well as the importance of working together to find common solutions.

Marc Waage, Denver City and County Representative for the Metro Basin Roundtable, began his comments by making light of the often-adversarial position occupied by the urban districts in water planning discussions. As the home to the majority of Colorado's populace, urban districts will inevitably make demands on the state's water resources that the more agricultural regions are prone to protest. However, Waage pointed out, this opposition can be reframed in a more productive manner to achieve a healthy mutual understanding. Urban areas are responsible for the overwhelming majority of the state's economy and inevitably facilitate opportunities for the other regions. Furthermore, agriculture is responsible for 85% of the state's water consumption, but only 5% of the state's economy; indicating that urban and industrial regions are comparatively more efficient with their water use. Nonetheless, Waage highlighted the importance of working with the other

roundtables and noted a number of particular areas where he believes improvements in efficiency can and should be made: 1) joint planning regarding land and water use 2) requirements for water efficient plumbing fixtures 3) redevelopment of urban areas with a focus on water efficiency, and 4) development of new sources of supply from the western slope.

Gary Barber, Chair of the Arkansas Basin Roundtable, focused his initial comments on the history of the roundtable discussions and the value they present to statewide water planning efforts. Barber emphasized the extremely diverse interests of the various roundtables, but pointed out a common interest in a viable future is a shared goal for all participants. The most pressing problem for the Arkansas Basin Roundtable is determining alternatives to a 30% reduction in agricultural land required to meet the municipal gap. A 25,000-30,000 acre foot gap already exists, which has stressed the necessity for agricultural water reduction. This reduction is naturally unpopular for the agricultural regions, which have responded by pursuing three avenues to establish viable alternatives: 1) technical studies, 2) policy studies, and 3) pilot projects. Barber suggested that the emphasis for his roundtable is the importance of increasing storage capacity, maximum utilization of existing water, the need to frame the dialogue in economic terms, and the significance of collaborative solutions.

Ken Neubecker, Environmental Representative for the Colorado Basin Roundtable, had a markedly different set of concerns. As the only representative from the western slope, Neubecker stressed the importance of having an ecological perspective when forming engineering plans. Water plays an incredibly important role in sustaining life, and he argued that we must be careful not to view it merely as a commodity. He focused on the notable absence of reasonable allocations for "non-consumptive" use in current water plans, but contested the use of this term as often misplaced and inaccurate. Neubecker suggested that Colorado should place more focus on supplying an appropriate amount of financial resources to address how we might sustain a flourishing environment as well as a flourishing economy, and the need to develop appropriate modeling technology to address these concerns.

Sean Cronin, Chair of the South Platte Basin Roundtable, shared a number of observations from his experience. He highlighted the central importance of planning ahead and working together, and he applauded the roundtables for facilitating this essential interaction. Last year's floods plainly illustrated the need for forward-looking planning, as well as the reality that environmental concerns become an afterthought in times of emergency. The South Platte Roundtable is unique in the diversity of its concerns, requiring substantial amounts of urban, industrial, and agricultural use. Current growth rates suggest that this basin will continue to experience shortages. Thus, the importance of conservation is paramount, as is the need to develop new supplies, most likely from the western slope.

Despite the unique perspectives and interests of each of the panelists, all agreed that open communication and consistent dialogue are essential if we hope to secure a comfortable and living future for all Coloradans.

Bradley Kloewer

WATER PLANS IN COLORADO AND ELSEWHERE: PERSPECTIVES FROM ACROSS THE WEST

This year's annual University of Denver Water Law Review Symposium focused on Colorado's new State Water Plan ("Colorado Plan"). The third panel of the day included five speakers from different states who presented perspectives on their states' respective water plans. The discussion examined state water plans from Idaho, Wyoming, Texas, and California and applied the lessons learned in those states to Colorado's ongoing water plan drafting process.

The first panelist, Clive Strong, Chief of the Natural Resources Division of the Office of the Attorney General of the State of Idaho, provided an overview of Idaho's history with its water plan and identified ways he believed the plan has helped or hindered natural resource development and conservation in Idaho. Idaho implemented its first state water plan in 1976. This plan resulted from the City of Los Angeles Department of Water and Power's proposal to divert water from Idaho's Snake River through Nevada and into Lake Mead. In response, the Idaho Legislature promptly enacted a constitutional amendment that created the Idaho Water Resource Board as an effort to protect the state's water resources. The amendment empowered the Water Resource Board to develop a comprehensive state water plan.

The Idaho State Water Plan consisted of state-wide policies and basin-specific policies. The Snake River Basin Policy 32 is one example of a basin-specific policy. As Strong indicated, this policy established minimum stream flows for the purpose of allocating water between instream uses and consumptive uses at several locations along the Snake River. In 1986, Idaho revised its state water plan. Some of the revisions included incorporating the Swan Falls Settlement, which resulted from *Idaho Power Company v. State*, 661 P.2d 741 (Idaho 1983). The Swan Falls Settlement balanced the competing needs of hydropower and consumptive uses and provided for a new increase of minimum flows, which decreased the potential for water development from 800,000 acre-feet to 450,000 acre-feet. In 2012, Idaho again revisited its state water plan to update the Snake River Policy and to provide new plans for the future.

Strong concluded with his advice for successful state water plans. Strong emphasized that successful state water plans must have the ability to change. Additionally, Strong mentioned that a state should measure its plan's success by its implementation and not by its planning.

The second panelist, Steve Wolff, Colorado River Coordinator for the Wyoming State Engineer's Office, discussed his experiences and personal perspectives regarding Wyoming's water plan and how Colorado's new water plan could benefit both states. Wyoming divides its water planning between the State Engineer's Office and the Wyoming Water Development Commission ("WWDC"). In 1973, Wyoming completed its Statewide Framework Water Plan, which predicted future demands and listed strategies on how to address future demands.

This plan remained in effect until 1997, when the Wyoming legislature directed the WWDC to conduct a water planning feasibility pilot study with the

assistance of the University of Wyoming and the State Engineer's Office. The legislature intended for this study to build on existing data sets and to maximize public access to the data and the process. The first round of the study consisted of gathering inventory and information. The study began with the Green and Bear River basins and eventually included all seven basins in Wyoming. The first round also developed Basin Advisory Groups ("BAGs"), similar to Colorado's basin roundtables. Wolff explained that these BAGs provided public input to the planning process and helped identify the public's concerns. The state completed the first round in 2007. Wolff explained, however, that the next round—the implementation stage—never happened. Instead, the State decided to repeat the first round to gather more information.

Wolff concluded his presentation with an analysis of the success of Wyoming's state water plan. In Wolff's opinion, the plan successfully developed a comprehensive data set that is accessible to everyone, which created transparency. The plan also successfully developed relationships through the creation of the BAGs. However, Wolff opined that Wyoming's plan failed at the implementation phase. Instead of implementing the plan in 2007, the plan began round one again and continued to gather information and data from the various basins.

The third panelist, Elizabeth Fazio, Director for the Committee on Natural Resources in the Texas House of Representatives, discussed the Texas State Water Plan ("Texas Plan") and the process the State took to pass legislation to finance water development projects over the next fifty years in Texas. Fazio began her presentation with an overview of Texas's future water needs. She displayed projections showing that the population in Texas will almost double by 2060 from 25.3 to 46.3 million people. Additionally, if Texas does nothing to implement a state water plan, models predict a water shortage of 8.3 million acre-feet of water by 2060. Therefore, the need for a successful water plan will grow as the population continues to rise.

The 2012 Texas Plan is the most current state plan. The state plans on a five-year cyclical basis over a fifty-year horizon. The Texas Plan consists of sixteen Regional Water Planning Groups and 562 Water Management Strategies. The State determined the plan's total cost at $53.1 billion. When the state surveyed local and regional entities as well as water providers, those entities estimated they needed help to finance about $26.9 billion of the total cost.

Fazio discussed how the state considered financing the Texas Plan. Some ideas included tap fees, water hog fees, electric fees, and one-time capitalization. However, as Fazio discussed, none of these ideas would cover the full $26.9 billion. Texas then looked into financing the Texas Plan using Texas's "rainy day fund," funded by oil and gas revenue. As Fazio discussed, the plan needed $2 billion from the rainy day fund. This amount could create a revolving program that would finance the required $26.9 billion.

In Fazio's opinion, the issues with the Texas Plan came not from the implementation of the plan but from the financing and development of the plan. Even with $2 billion from the rainy day fund, the Texas Plan needed entities to implement and develop projects. Fazio emphasized the importance of creating incentives by lowering interest rates, providing deferred loans, or providing longer repayment terms. These incentives would help create a dynamic and

innovative revolving State Water Program. The Texas water plan uses the two billion dollars from the rainy day fund to issues debt at the local and state levels to finance the incentives.

In her presentation, Fazio emphasized the importance of local control to the Texas Plan's success. Localities fund and build the projects at a local level and, therefore, it is important that the localities have control of the projects.

The fourth panelist, David Aladjem, Partner at Downey Brand, LLP in Sacramento, discussed California's State Water Plan ("California Plan") and how Colorado could learn from California's experience with its own water plan. Aladjem began his presentation by discussing the evolution of the California Plan. He focused on five different important ways that the plan has evolved since 1957. As Aladjem explained, the plan has moved (i) from a project-focused plan to a sustainability-based plan, (ii) from a centralized plan to a localized plan, (iii) from a practical approach to a theoretical approach, (iv) from an engineering focus to a political focus, and (v) from the central guiding document for state water policy to a peripheral document. As Aladjem argued, the California Plan is no longer the centerpiece in California, and most of these five evolutionary changes have weakened the success of the plan.

Aladjem concluded with some questions Colorado should consider for its own state water plan. For example, what is the plan's purpose? Who controls the plan? Who resolves differences among stakeholders? How does the plan direct actions? And is there any accountability? Answering these questions early on, Aladjem suggested, could help Colorado implement a successful state water plan.

The final panelist, Sarah Klahn, Managing Partner at White & Jankowski, LLP in Denver, provided a Colorado-based perspective on the new Colorado Plan in the context of water ecology, water rights, and water law. Klahn provided a practitioner's perspective on how the Colorado Plan would affect her clients, whether they are large municipalities or small agricultural users. Klahn argued that Colorado does not currently need a state water plan. She contrasted the implementation of California and Idaho's plans to Colorado's. California and Idaho's plans arose out of a water crisis or incident in each state. Klahn argued, however, that while Colorado faces gaps in supply and already visible adverse effects from climate change, there is currently no water crisis in Colorado that would necessitate a water plan.

Klahn discussed her concerns regarding the impact that the Colorado Plan could have on Colorado's prior appropriation system. Relatedly, Klahn worried that if the state decides who has the highest and best use of water, the Colorado Plan effectively will lead to a public trust doctrine—a doctrine the Colorado Supreme Court has rejected. Klahn also questioned how the Colorado Plan will make decisions in a way that does not disadvantage people's private property interests.

Klahn provided several reasons that the implementation of a Colorado Plan may be premature. For example, Klahn suggested that the Colorado Plan will potentially hinder municipalities' ability to obtain new water supplies in the absence of new projects. Many municipalities currently find additional water supplies through water rights transfers from irrigated agriculture. Klahn discussed that one of the Colorado Plan's goals—to reduce the rate of

agriculture-urban water transfers, or "buy and dry"—would remove this process as a viable option. Additionally, Klahn worried that the Colorado Plan will undermine local and regional decision-making, which will be problematic for small cities and industries. She also questioned how the Colorado Plan intends to convert the basin roundtables' recommendations to the state level without taking away local control. Finally, Klahn questioned whether the state as a whole is in the position to do more than provide financing for a state water plan.

In sum, the panelists provided an interesting and stimulating discussion on the differences of state water plans in several western states. Their discussion highlighted the major successes and failures of different state water plans and how Colorado could learn from these plans in implementing its own state water plan.

Autumn Aspen

ROCKY MOUNTAIN LAND USE INSTITUTE ANNUAL CONFERENCE 2014: MOVING BEYOND RECESSION, WHAT'S NEXT?

WATER SUPPLY CHALLENGES AND SOLUTION FOR THE ROCKY MOUNTAIN WEST

Denver, CO March 12-14, 2014

On the final day of the Rocky Mountain Land Use Institute's 2014 Conference, a panel of water professionals greeted an audience of land use planners. Titled "Water Supply Challenges and Solutions for the Rocky Mountain West," the conversation that emerged called for a movement from the days of diverting water through pipes to engaging in critical dialogue about water in the public forum

The panel included three speakers, each with a nuanced expertise underlying his perspective of the future of water in the West. Grady Gammage, attorney at Gammage & Burnham and Senior Research Fellow at Arizona State University's Morrison Institute, presented his research on the Central Arizona Project and the diversion of Colorado River water to make Phoenix and agricultural land in Arizona possible. James Eklund, Director of the Colorado Water Conservation Board, discussed his efforts to garner community input for an in-progress draft of the Colorado Water Plan. Jim Lochhead, CEO of Denver Water, closed the panel with broad commentary on the paradigm shift occurring around water and Denver Water's collaborative approach to planning for the future.

Despite the panelists' respective interests in research in Arizona, policy in the state of Colorado, and pragmatics in Denver specifically, each lamented the historical and present state of water politics and called for strengthened relationships between the different players at the water-planning table. Under the broad umbrella of "water supply challenges and solutions," the speakers pointed to the particular problem of adversity between agricultural and municipal water users, and the creation of more integrated and cooperative community relationships required to reach a solution.

According to Grady Gammage, the current debate around water supply and scarcity is a battle between "plumbers and planners." Plumbers address the societal problem of water scarcity by building pipes and dams to transport water, and then leave the problem there. This mentality, that we can move water wherever we need it but should avoid complex conversations about water use, pervades our water paradigm as the way we successfully settled the West. According to Gammage, the time for the plumber mentality is over. With the help of planners, we must now face the difficult question of how to use the water we have.

In a presentation of his report on the Central Arizona Project, Gammage emphasized the false assumptions underlying popular belief about Phoenix, Arizona. Gammage especially lamented the way people outside of Phoenix perceive the city as the most unsustainable city in the world. In reality, city planners in Phoenix are always conserving four years of extra water supply, and are in that way models for wise water planning. According to Gammage, overly critical external beliefs about Phoenix cripple effective water planning in the West as a whole.

Gammage emphasized that every city in the country uses more water than falls in rain. Unlike Colorado, Arizona has the fortune of growing crops and people in the same place, converting land from farming to subdivisions, which use less water respectively. His report called for a reconfiguration of the belief that Phoenix is a "giant demographic mistake," using population and precipitation data to analyze the issues surrounding Arizona's continued growth despite increasing population and decreasing water resources. It sought to educate the public about the Western water systems and their reliance on a highly variable field. Some years yield much precipitation; other yield only drought. Western water systems are built with certain amplitude of variability, but climate change raises questions about whether we are making the right assumptions.

In framing the discussion around use of current water resources and the land-water nexus, Gammage pointed to several choices Arizona needs to make to determine where it (and presumably, the West more broadly) can continue to grow. These competing priorities include density, landscaping, the lifestyle of affluence (such as swimming pools in the desert), aesthetics in the urban environment, integrity of the natural environment, and agriculture. This final concern was of particular interest to Gammage. He believes we should use water as a policy for preserving some measure of agriculture in Arizona, which currently allocates nearly half of its water to crop production. The benefit of keeping agriculture in Arizona's water use plan is the ability to move water between agriculture and the city in varying times of drought and plenty.

According to a disappointed Gammage, his report failed to spur sufficient dialogue to facilitate the paradigm shift required around water in the West. The Sun Corridor, occupying the entire southern portion of the state of Arizona, can continue to grow until 2030, but it is uncertain what will happen after that. The uncertainty surrounding climate change requires critical conversation about water resources and collaboration between typically adverse land developers and water planners. According to Gammage, mere water use reduction evades the real question of how to plan for decreasing water resources. He adamantly believes that rather than augmenting water supply like

plumbers, we need to address the pivotal questions of planners.

James Eklund of the Colorado Water Conservation Board brought the conversation closer to home with a call for collaboration on the drafting of the Colorado Water Plan. He discussed historical skepticism to a statewide water plan, due to widespread faith in the doctrine of prior appropriation. The changing paradigm follows social and environmental challenges ranging from drought to wild fires to severe floods. Colorado's ability to meet these challenges requires an intentional and collaborative plan.

While noting the weaknesses of the prior appropriation doctrine, Eklund emphasized its resiliency and ability to adjust. He denounced efforts to do away with prior appropriation, instead calling for a statewide water plan that can and must work within the doctrine on which our system of local control and private property rights rests. Stating that this status quo solution to scarcity is unacceptable, Eklund called for a Colorado Doctrine formed of collaboration and action. Cooperation and shared self-interest must overcome rhetoric on both sides of the water use divide.

Eklund's presentation echoed the water supply challenges Gammage detailed, including the gap between supply and demand, the degradation of rivers, the shortsightedness of buy-and-dry, and the sluggish movement of regulatory processes. In response to these challenges, Eklund envisions a secure water future including vibrant sustainable cities, healthier water and natural environment, robust recreation and tourism, and viable and productive agriculture.

According to Eklund, the solution to the challenges Colorado faces in its efforts to secure a sustainable water future is a comprehensive and collaborative Colorado Water Plan. The draft plan is due to the incoming Governor on December 10th, 2014, a deadline intentionally placed after election season so as to avoid political influence. Whoever is then governor will either remand or approve the plan, at which point Coloradans can begin creating their own plan for the trajectory of water in the state. Eklund admitted that Colorado is not a pioneer in state water planning, noting that all Western states have water plans except Colorado and Arizona. Rather than maintaining the disconnected spectrum of opinions about water that currently exists, Eklund called for Colorado to join the state water planning movement as a united front.

In order to achieve that unity, the Colorado Water Conservation Board is facilitating a bottom-up approach, which former Speaker Russ George established, to take water conservation out of party politics and bring it to the public. Basin Round Table meetings are currently taking place, bringing together ranchers, farmers, non-profits, and residents to participate in the creation of the Colorado Water Plan. In order to broaden what has been an insular conversation over the last several years, Eklund elicited a call to action. He urges Coloradans from all walks of life to participate in the water planning process. Those who are interested can visit www.coloradowaterplan.com to begin attending Basin Round Tables and submitting comments to the drafting process. Even more importantly, Eklund asks Coloradans who care about water to talk to their neighbors about participating in a community-based solution to the state's water challenges.

CEO of Denver Water Jim Lochhead offered an even more focused

perspective on water planning and reinforced Gammage and Eklund's insistence on an integrated discussion around realistic water planning. Despite Western explorer Zebulon Pike's early celebration of water scarcity as a barrier to unchecked Western expansion, infrastructure melded with a distinctly plumber-like mentality to allow the city of Denver to exist. Today, Denver Water serves over one million people with only two percent of the state's water supply.

Lochhead summarized the organizational structure of Denver Water and illustrated a few ways in which it is a unique water provider, independent of land use management. Even further than operating like a business that can pour its rates back into the system to encourage customer conservation, Denver Water is participating in planning discussions among states in the Colorado River Basin. This conversation is necessary because the future of Colorado's water supply is at stake. As all three of the panelists suggested, water planners have moved from an era of supply development to an era of limits and thinking about sustainability in the face of complete uncertainty. The water system is no longer just about infrastructure, but also includes watersheds, the western slope, and the direct connections between urban centers throughout the Basin.

Lochhead explained that the dialogue needed around water is not simply about conservation. A secure water future requires planning around economic and natural resources sustainability. While the historical conversation around water consisted largely of self-interested appropriation, the new trend must relate to uncertainties and topics that political leaders are typically uncomfortable addressing. Among the topics that Lochhead considered of primary importance in the water planning conversation are climate change, population growth, river diversion security, and permitting efficiency.

According to Lochhead, the more we learn about climate change, the more we realize we do not know. It is unclear whether a changing climate will result in more precipitation or less, and our water rights system is built on assumptions about fixed amounts of water. Lochhead suggested the need to develop a regulatory and allocation plan that responds to a changing climate and its impacts on hydrology.

Lochhead encouraged the conversation around growth to shift from planning how much Colorado can grow to strategizing for how exactly Colorado should grow. Colorado's doubling population requires municipalities and other players to come together to discuss urban sprawl and water use. Lochhead was adamant that population growth cannot continue in the same way that led to the last five million people in Colorado. Rather than having a simple conversation about meeting a water supply gap, water planners and land use planners must collaborate to craft a long-term plan about how to grow within existing service areas while meeting the needs of a growing population.

Lochhead also acknowledged a major concern with Colorado River security. Cities like Denver have grown dependent on allocation of the Colorado River founded on the Colorado River Compact, which overestimated water supply and assumed agricultural development on the river. Our needs are different now, and the Colorado River is burdened with environmental and recreational interests, as well as municipal needs. Like Gammage and Eklund, Lochhead called for more cooperative conversations between urban and agricultural projects so as to avoid massive dislocations, economic instability,

and recreational impacts on cities.

Finally, implementing creative solutions to Denver and the Colorado River Basin's water supply challenges requires quicker permitting processes. Lochhead called for the development of a permitting process that includes some level of logic. He suggested continued effective environmental analysis, but at a pace that allows water users to get through the process in a reasonable amount of time.

Recognizing the practical reality that transcontinental diversion projects are too costly to serve as potential solutions, Lochhead closed the RMLUI panel by reiterating the need for true communication and collaboration between interest groups, particularly land use and water planners. Discussion of the real issues at stake will require political courage and committed community participation. By moving past an "us vs. them" mentality, Colorado can integrate uncertainties into a plan that will sustain the Front Range economically, environmentally, and from a smart-growth perspective.

Ashley Basta

LAND USE TOOLS FOR A WATER-SMART FUTURE: TRAINING COMMUNITIES AND BUILDING NETWORKS

As part of its weeklong conference, the Rocky Mountain Land Use Institute ("RMLUI") hosted a three-member panel that discussed land use and its importance in water-related issues, especially in Colorado and other western states.

The host of the panel, Drew Beckwith, a water policy manager with the Western Resources Advocates, first addressed the growing gap in urban water supply. Beckwith explained that as population continues to grow there is a constant concern over the availability of water for future generations. Beckwith mentioned that because of this population growth, the demand on the Colorado River will exceed its supply sooner than expected. Before introducing the speakers, Beckwith addressed how land use substantially affects water supply and emphasized that different geographic locations face different land use challenges.

The first speaker, John Nolon, professor at the Land Use Law Center at Pace Law School, discussed integrating water and land use planning through leadership training. Nolon focused on the work of the Land Use Leadership Alliance training program ("LULA program"), which educates local land use decision-makers on legal tools and techniques. The step-by-step LULA program focuses on reaching out to prominent local leaders, bringing them into the training program, educating them on land use and decision-making, and subsequently having them implement post-training strategies in their localities. The LULA program selects communities that have something in common with each other or are geographically proximate, such as Aurora and Castle Rock in Colorado, to organize the dialogue and address programs at a regional level. The program then introduces prominent local leaders to the program and focuses their work on legal research and policy issues. The program finds great importance in urban form—the spaces and boundaries that make up a city.

Additionally, the kind of buildings constructed in a city can create water consumption rates that vary greatly. Nolon argued that there is a need to integrate water and land use planning, since a majority of water supply planners do not consider urban form as having a direct relevance to water consumption. The training itself takes four days and the participants develop strategies to implement the program after the training.

Nolon also addressed the lessons learned from the program. First, Nolon noted that there is a lack of horizontal connection within some cities and amongst other cities. Second, there is a lack of vertical connection between regional and state agencies. Third, the instructions for completing water conservation plans do not focus on land use, although knowledge of land use law is important for water planners. Furthermore, Nolon expressed the importance for land use planners to recognize the importance of understanding water supply projections. The strategies thus far developed from the program include creating water elements for comprehensive planning in community developments, considering water in making discretionary project decisions, and redrafting zoning and subdivision regulations.

The second speaker, Greg Fisher, manager of demand planning at the Denver Board of Water Commissioners ("Denver Water"), discussed Denver Water and its perspective on land use and water in Colorado. Denver Water is an independent municipal agency first established in 1918. Its funding comes from water rates and tap fees, and the agency employs 1,100 employees in twelve counties and serves about twenty-five percent of Colorado's population. Denver Water has a collection system containing four thousand square miles of watershed, nineteen reservoirs, two tunnels, and nine hydroelectric power turbines.

Fisher addressed the land use issue in Colorado: eighty percent or more of Colorado's water is on the western slope while most of Colorado's residents live on the eastern slope. Denver Water expects Colorado's population to grow by the millions and, because of this, water providers will have to meet the growing demand. Based on its per capita use goal calculations, Fisher stated that Denver Water set a twenty-two percent water reduction goal by 2016. The reduction will target all customers by providing conservation incentives, utilizing marketing tools, and including an outreach program. Fisher closed by saying Colorado's population will continue to grow, and the State accordingly needs to consider many conservation techniques, including what landscaping is appropriate for the state. Since Colorado residents value the state's open spaces and forty percent of Denver Water's use goes towards outside use, this issue is imperative and the concern will continue to grow with the population.

The last speaker, John Fernandez, the FasTracks and Transit Oriented Development team leader for the City of Aurora, discussed land use and water conservation in Aurora. Fernandez first talked about how important transportation is to water conservation in Aurora. Fernandez argued that the FasTracks system's development around transit centers is critical to reduce water needs and raise income levels by allowing the transit centers to become economic centers.

Because Aurora also faces population growth, demand and supply planning are important. Population scanning, growth projections, and improvement projects are routinely evaluated. Future tools for Aurora include regional

growth plans, redirecting sprawl around transit centers, maintaining growth allocations, and creating a new policy called "Metro Vision", which seeks to concentrate fifty percent of the new housing and seventy-five percent of the new employment in urban centers. The next steps for Aurora include major revisions to tap fees and rates, new park and open space dedications, re-zonings along the urban centers, and designation of new urban centers.

Overall, the panel provided a detailed overview about how land use issues and water use issues significantly affect each other, and how developers need to address both concerns.

Devon Bell

THE DOLLARS AND SENSE OF WATERSHED ECOSYSTEM SERVICES

Nearly four hundred guests attended the twenty-third annual Rocky Mountain Land Use Institute ("RMLUI") conference, which addressed the topic "Moving Beyond Recession: What's Next?" The conference drew private and municipal planners, land use attorneys, public officials, developers, and many others to the University of Denver Sturm College of Law for three days and presented over forty panels of speakers.

The session titled "The Dollars and Sense of Watershed Ecosystem Services" included a moderator and three speakers that explained what ecosystem services are—specifically relating to watersheds—and offered examples ranging from the global context to local watershed protection efforts.

"Ecosystem services" are the collective benefits humans receive from a healthy, well-functioning ecosystem. To give a simple example, upstream vegetation filters harmful contaminants out of water as it moves downstream. Ecosystem services fall into four categories: supporting services, regulating services, provisioning services, and cultural services. Watershed ecosystems primarily provide a regulating service in the form of cleaner water for human use because healthy ecosystems naturally purify water. The panelists used watersheds in Colorado as an example. When watersheds in high elevations are healthy, cleaner water flows into reservoirs, allowing water providers like the Denver Board of Water Commissioners ("Denver Water") to save money on purification. The panelists focused on how watersheds and users can fund and provide ecosystem services that can help to maintain healthy watersheds.

Devon Buckels, a member of the American Institute of Certified Planners, moderated the panel. Buckels works for the Environmental Protection Agency as an Urban Waters Partnership Coordinator and serves on the Denver Sustainability Advisory Council. Through these positions, he plays an important role in the South Platte River Urban Waters Partnership, making his background well suited for moderating a discussion on watershed ecosystem services.

The first panelist, Kate Hamilton, an independent consultant and member of the Colorado Governors' Climate and Forest Task Force, offered a global perspective on ecosystem services. Hamilton studies what water users currently pay for ecosystem services worldwide. She stressed that this is different than measuring the value of ecosystem services because the value incorporates many different considerations and indirect benefits that actual payments do not.

Hamilton divided ecosystem services payments into three major groups: (i) payments made by companies driven by regulation, (ii) payments made by governments, and (iii) purely voluntary payments, such as Earth Day tree-planting. Hamilton pointed out that the phrase "ecosystem services" encompasses a wide range of services from carbon sequestration and trading, to pest control and air purification. She remarked that unlike other environmental markets such as carbon trading, watershed ecosystem service programs require unique tailoring for each watershed.

Hamilton stated that watersheds receive the most money globally of any ecosystem service. Hamilton also described "watershed payments" as essential to the management of our "natural infrastructure" because they identify and protect the benefits ecosystem services provide that we depend on, like pollution filtration or flood control. However, Hamilton noted that amongst watershed services programs, there is a great variation in the degree of monitoring and measurement of the benefits watershed payments provide. This issue makes it difficult for economists to quantify the impact of these programs.

The next speaker was Travis Warziniack, a U.S. Forest Service ("USFS") economist with the Rocky Mountain Research Station's Human Dimensions program. Warziniack focused on the evaluation of watershed ecosystem services with respect to providing safe drinking water. According to Warziniack, the USFS's "Forests to Faucets" surface drinking water program identifies key watersheds that would benefit from watershed payments. To qualify for the program, an area of USFS land must supply drinking water, be threatened by development, and must have consumer demand for the water. Warziniack mentioned that USFS land is the largest single provider of water in Colorado, supplying around sixty-eight percent of the state's surface water; indeed, the federal government owns nearly forty percent of Colorado land.

Warziniack also discussed Code of Federal Regulations 36 § 219.1 ("USFS Rule"), which sets forth rules and regulations pertaining to National Forest system land management planning. This 2012 USFS Rule provides a legal structure that compels the USFS to employ ecosystem services programs in conjunction with other uses of the land.

He expressed frustration with the drafting of this section of the USFS Rule. Warziniack suggested that many USFS foresters would prefer to take an approach similar to zoning in the municipal land use context—that is, the USFS would prefer to designate certain areas for elk habitat, other areas for hiking, and separate areas for watershed conservation. However, the 2012 USFS Rule requires multiple uses of the same land. Thus, areas selected for watershed conservation often must perform another function, such as allowing mountain bike trails. Warziniack indicated that the USFS Rule prevents foresters from using their discretion in implementing their preferred forest management techniques. In light of the USFS Rule and greater general publicity of forestry practices, Warziniack submitted that the renewed widespread interest in forest management by non-foresters stems from fiscal concerns caused by wildfires. As recent wildfires have demonstrated, the alternative to responsible forest management and strategic watershed ecosystem service payments is extraordinarily expensive.

Finally, Don Kennedy, an environmental scientist and member of Denver

Water's Planning Division discussed watershed management and wildfire impacts. Kennedy said that over the past century or so, authorities have not properly managed Colorado's forests due to the low value of Colorado timber, leading to adverse impacts on Colorado water sources.

For example, Kennedy stated that this situation contributed to the larger and more frequent wildfires that Colorado has experienced in recent years. Kennedy highlighted the 1996 Buffalo Creek fire that consumed nearly 12,000 acres in about four and a half hours. Two months after the fire, a two-inch rainstorm created massive problems for Denver Water. The rainwater carried a large load of sediment with debris that included charred trees, propane tanks, heavy metals from burnt trees, and dissolved oxygen into the Strontia Springs Reservoir. Denver Water paid more than thirty million dollars to dredge the reservoir. This attempt to make the water potable failed, however, because it failed to remedy the water's high manganese content. Kennedy offered several mitigation techniques that, if used as preventative measures, would have been drastically cheaper and more effective than dredging the reservoir. The potential mitigation techniques ranged from straw bale check dams and contour felling of trees, to salvage logging and hydro-axing of trees to prevent sediment from getting into reservoirs.

The panel then addressed questions from the audience, one of which was, "how is Denver Water paying for its watershed ecosystem services program?" Don Kennedy explained that Denver Water does not include line item fees on bills to customers; instead it incorporates the cost of the program into rates. He added that grants from the federal government and other partnership opportunities have helped to reduce the program's cost for customers.

The RMLUI's 2014 conference was a success due to informative panels like this one. Each panel focused on timely and pressing issues while providing innovative approaches to consider for the future.

Emily Dowd

CELEBRATING 40 YEARS OF SUCCESS AND CHALLENGES FOR COLORADO'S INSTREAM FLOW PROGRAM

Denver, Colorado January 15, 2014

"O, dear daughter, be not discomforted!
They can attempt to possess your beauty
Beyond measure, without sufficient ends
And looking glasses, frenzy, berserk, de-
Hydrate marvels they have engineered in
Fact, conveyance, deed, statute, law, decree,
Cannot substitute for the Natural Stream
Of your loving boundless intimacy."

-Excerpt from "Mother to Daughter," written and read by Justice Gregory J. Hobbs, Jr. in celebration of the fortieth year of Colorado's instream flow law January 15, 2014.

Roughly 200 western water policy enthusiasts gathered in the Colorado Supreme Court's Courtroom on January 15, 2014 to celebrate the 40th anniversary of the state's Instream Flow ("ISF") Program and discuss the program's role in the future. Twenty-four entities generously hosted the cordial event including the Rocky Mountain Land Use Institute, the Colorado Water Congress, the Nature Conservancy, the University of Denver's Water Law Review, and the law firm Kaplan, Kirsh, & Rockwell just to name a few. Several of the attendees were *Water Law Review* former staff, Board members, and contributors.

ISF PROGRAM BACKGROUND

In 1973, the Colorado legislature integrated instream flow water rights by entrusting the Colorado Water Conservation Board ("CWCB") with the state's appropriation authority to preserve the natural environment to a reasonable degree. ISF water rights are non-consumptive and in-channel or in-lake uses of water that the CWCB holds to ensure minimum flows on certain reaches of streams and rivers and in lakes. The CWCB consults with hydrologists, engineers, natural resource scientists, and geomorphologists, among others, to make factual determinations about which lakes and stretches of stream to preserve and improve to a reasonable degree. The IFS Program helps the state protect diverse ecosystems ranging from coldwater fisheries and waterfowl habitat to glacial ponds.

A series of lawsuits challenged the CWCB's authority to appropriate water without diverting it from streams. Several water users claimed that in Colorado, the right to use water requires a physical diversion in addition to the claimant showing the water will be put to a beneficial use. Over time, the Colorado Supreme Court clarified that ISF appropriation by the CWCB is a legal means of ensuring minimum stream flow to preserve the natural environment to a reasonable degree, the CWCB's ISF water rights are subject to temporal priority under the prior appropriation doctrine and newly appropriated ISF rights are typically junior, and that the CWCB has a fiduciary duty to enforce the use right in the name of the people of Colorado.

Colorado's 1986 legislature recognized the value of marketable water rights for instream flow by allowing the CWCB to accept donations and purchase senior vested water rights. "The board also may acquire, by grant, donation, bequest, devise, lease, exchange, or other contractual agreement. . . water, water rights, or interests in water. . .The board may use any funds available to it for acquisition of water rights and their conversion to instream flow rights." In this state, the right holder vests water rights through *beneficial use* of the water. The 1986 statute permitted the CWCB to convert the beneficial use from the original right holder's use (*e.g.*, agricultural use, irrigation) to the CWCB's use of preserving or improving the environment to a reasonable degree and maintaining minimum stream flows and lake levels.

Since 1973, the CWCB has appropriated over 9,000 miles of stream and roughly 480 natural lakes and acquired over twenty-five water right donations or long-term contracts for water totaling 500 cubic feet per second. That means that by 2014 the CWCB appropriated either junior or senior rights on nearly

one third of the state's perennial streams for preserving and improving the natural environment to a reasonable degree.

THE ISF PROGRAM'S 40TH ANNIVERSARY CELEBRATION

Colorado Supreme Court Justice Gregory J. Hobbs Jr. welcomed attendees at the ISF Program's fortieth anniversary celebration with his keynote historical overview of the state's water laws. For twenty-three years before joining this state's highest court, Justice Hobbs practiced environmental, land use, and water law. Since 1996, Justice Hobbs served the people of Colorado on our Supreme Court and plans to retire in 2016. Justice Hobbs read his fortieth anniversary ISF Program poem, "Mother to Daughter." Hobbs spoke enthusiastically about how the advocacy that led to instream flow rights demonstrates our community's common bond: a deep value in Colorado's rivers, streams, and lakes. He stressed that Coloradans put their hearts, minds, and passions into the water policy shift that the ISF Program embodies. Hobbs submitted that the ISF Program "is a landmark of the integration of the values of the flow into a prior appropriation water law system."

Justice Hobbs explained that the ISF Program came about following an intense pro-development era and represents the paradigm shift of the 1970's, when many people simply wanted to protect what was left of the natural world. During this period the United States legislature enacted the Clean Water Act, the Clean Air Act, the Endangered Species Act, and the Federal Land Policy and Management Act, along with other significant environmental legislation.

According to Justice Hobbs, the central challenge of the ISF right in Colorado was determining whether the state's water laws allow a use-right without diversion. He explained that the 1975 Colorado Supreme Court gave deference to the legislature by upholding the ISF law because the CWCB's water right is junior to the senior right holders and does not cause injury to prior water rights. Today, the ISF Program enables the CWCB to protect waterways and improve water quality. Justice Hobbs concluded his introductory remarks by characterizing the ISF Program as "work well-done and work well to be done!"

A RETROSPECTIVE ON THE ISF PROGRAM AT 40

Linda Bassi discussed the ISF Program's accomplishments and moderated the first panel of speakers, which included Patti Wells and Eric Kuhn. After working for the CWCB for a decade, Bassi is now the CWCB's Stream and Lake Protection Section Chief. She has extensive experience with the ISF Program both from her work at the CWCB and in the Attorney General's office representing the Division of Water Resources and the CWCB.

Bassi explained the ISF Program has a multifaceted role in the water community. The program involves the CWCB's (i) coordination with federal agencies to address federal resource protection goals through state-held water rights, (ii) partnerships with water suppliers to enable water projects to move forward while protecting the natural environment, and (iii) collaboration with Colorado Parks and Wildlife and conservation groups to protect and improve

Colorado's rivers, streams, and lakes. Bassi's presentation included photos of stunning landscapes and waterways throughout Colorado that the ISF Program empowered the state to protect through appropriations, acquisition agreements, and donations. Boulder Creek, the Colorado River, Dead Horse Creek, and Hanging Lake are just a few of the watercourses benefiting from the IFS Program. Bassi noted that Governor Hickenlooper's executive order compelling the CWCB to create Colorado's first Water Plan ("CWP") directs the CWCB to foster "a strong environment that includes a healthy watershed, rivers and streams, and wildlife."

Patti Wells discussed the IFS Program's elements that make it work and allow it to endure today. Wells serves as the Denver Water Board's ("DWB") General Counsel as she has since 1991. She also represents the City and County of Denver as a CWCB board member. Wells is a former board member of the Water Quality Control Commission and the Colorado Water Trust. Mayor Peña appointed Wells as Denver's first female City Attorney.

According to Patti Wells, the ISF Program's two essential elements are its "requirement for balance and the involvement of the public." To demonstrate the balance element, Wells quoted the statute's directive for the CWCB "to correlate human activity with reasonable preservation of the natural environment" and mentioned that over time this phrasing turned out to be brilliant. Wells maintains that the CWCB tends not to engage in extremist, absolutist discussions because the wording of the statute guides the CWCB to consider what is necessary to a reasonable degree.

Wells emphasized the ISF Program's public notice and comment process while comparing the administrative agency setting to litigation. Wells suggested that much of the program's flexibility is because the CWCB makes decisions in a boardroom with public input instead of in a courtroom. The fact that the CWCB's determinations are reviewed under the Administrative Procedure Act is especially significant to Wells because it means that courts usually defer to the CWCB's findings. In addition, when experts appear in front of the CWCB they do not duel each other as they might in a judicial proceeding.

Another strength of the ISF Program, according to Wells, is that the CWCB must have a natural landscape that requires protection in order to acquire rights unlike the federal government's methods of water right acquisition. She used the example of Hanging Lake to illustrate part of the CWCB's decision-making with regards to water rights acquisition. The Board hiked to Hanging Lake and after seeing "the mist in which the Columbine grows" determined that the landscape needed all unappropriated water there to protect that particular environment to a reasonable degree. Wells considers the ISF Program to function well because it is a robust form of state-based environmental protection that enables Colorado to protect itself from the "heavy hand of the federal government." Wells concluded by commending the ISF Program for its contemplation of all water uses, inherent flexibility, and great results.

Eric Kuhn followed Patti Wells in the first panel of speakers. He is the General Manager of the Colorado River Water Conservation District, (the "River District"), a former board member of the CWCB representing the Colorado River Basin, and an at-large Inter-Basin Compact Commission ("IBCC") representative. Working for the River District since 1981, Kuhn

possesses a deep understanding of the work it does in this state. The River District's charter from 1937 empowers it to "preserve and conserve for Colorado, its Colorado River Compact entitlement."

Kuhn outlined the River District's "evolution" in relation to the ISF Program, explaining that it originally opposed the program, then supported the program, then opposed the program again. Today the River District works to improve the ISF Program. A future challenge Kuhn detects for the ISF Program relates to how the state should deal with recreational activities. He clarified that providing water for recreation is outside the scope of the CWCB's charge to protect the environment to a reasonable degree but he perceives it as a looming dilemma that requires a broader discussion.

A FORECAST FOR THE ISF PROGRAM: ITS CHALLENGES FOR THE FUTURE

Melinda Kassen, the Principal of WaterJamin Legal and Policy Consulting Services and member of the IBCC, moderated the second panel, which included James Eklund, Drew Peternell, and Amy Beatie. Kassen posed several introductory questions to the panel such as "what new types of water rights could the state create;" "how far should the ISF Program go;" "should we be protecting shoulder flows;" "should we be protecting more than just cold-water fisheries;" "should we be protecting peak flows;" "what else can the state do to protect current flows while looking at warmer, drier times;" "who should be allowed to hold these flows—should it always remain exclusively in the hands of the CWCB;" and "how should the state evolve the program to make it stronger and more meaningful?"

James Eklund, the CWCB's executive director, said, "people think of Colorado water law as a slow, lumbering beast with little ability to change—but if you step back and squint your eyes a little bit, or maybe a lot, you could get the impression that we actually have the capacity to innovate when the conditions demand it in this state." Eklund submitted that the ISF Program is part of Colorado's tradition of innovation in water law and policy and asserted that the CWCB's Water Plan is the next step.

To Eklund, the Colorado Water Plan represents "shaping the future of Colorado with intention." He warned that without a comprehensive state water plan, we run the risk of chaotic consumption of our most valuable resource in a divided and inefficient way that fails to provide certainty to water users—consumptive and non-consumptive alike. Eklund urged that the Water Plan is crucial for maintaining state ownership and control over our waterways and the habitat the waters provide. He posited that if Colorado wants to maintain control over its water, then it requires "a way to preserve, improve, and enhance—to a reasonable degree—our ISF Program." Eklund said that the CWCB is in the business of learning more about Colorado's rivers, streams, and lakes. He believes the future of the ISF Program involves a deeper scientific understanding of the state's water resources that will hopefully lead to an informed and engaged public with access to good facts about water.

Drew Peternell, the Director of Trout Unlimited's ("TU") Colorado Water Project, followed James Eklund. TU is a national, nonprofit fisheries

organization. TU's Water Project mission is to maintain and restore Colorado's rivers and creeks in order to sustain healthy coldwater fisheries. Peternell argued that the future of the ISF Program would increasingly involve the acquisition of senior water rights in order to put water back into depleted streams. Additionally, Peternell urged that the CWCB must address concerns from irrigators since they own the majority of the senior water rights. Peternell understands irrigators' interests because his organization regularly partners with them on projects that mutually benefit agricultural operations and coldwater fisheries. He believes that the state needs to do more to make the ISF Program attractive to irrigators. Irrigators hesitate to participate in the program because they must transfer their beneficial water use to the CWCB. The process leading to the CWCB's acquisition of senior water rights for restoring streams is too difficult, costly, and risky for many irrigators, according to Peternell.

Peternell discussed pending legislation proposed by Senator Gail Schwartz and endorsed it as a way to make the ISF Program attractive to irrigators. Senate Bill 23 would allow irrigators who make water efficiency improvements to transfer the right to the water saved by the efficiency improvement to the CWCB for instream flow use. Otherwise, little incentive exists for irrigators to implement water efficiency measures in Colorado's prior appropriation system. This would open a new category of water for ISF use to the CWCB. This bill would also incent organizations like TU to finance repairs of irrigators' aging irrigation infrastructure and allow irrigators to modernize their diversion structures more easily, which would ultimately keep more water in the streams. Peternell's emphasis on making it simpler, less expensive, and less risky for senior water rights holders to transfer their water rights to the CWCB for IFS use seems well placed.

Amy Beatie, the Executive Director Colorado Water Trust ("CWT"), left attendees with a sense of urgency to protect Colorado's waterways. As a University of Denver Water Law Review founder and current Advisory Board member, former law clerk for Justice Hobbs, and member of the Colorado Water Congress's Board of Directors, Beatie ardently spreads her passion for water law and policy. Beatie pointed out that the CWT does not have an advocacy or policy agenda. The CWT mainly participates in projects focused on restoring streams in times of drought. Beatie said that even though the CWT does not do policy, its people can still dream about what they want Colorado's rivers to look like. Amy Beatie emphasized the "obvious, yet understated power of people." She asked the audience questions about what could be accomplished if every person in the room spent five hours thinking of ways to make the program better and acting upon their ideas. Beatie stressed the power of innovation. Beatie compelled the audience to imagine what the success of the ISF Program looks like and what they could do to make the program better. Beatie then pressed the audience to "stop imagining and let's go out the door and start doing!"

AUDIENCE QUESTIONS & CONCLUSION

Both panels fielded questions related to instream recreational water use and recreational in-channel diversions ("RICD"s). Patti Wells expressed concern

about the prospect of legally requiring water providers to deliver recreational flows and said, "I am not sure that those flows are the responsibility of the state to provide." Drew Peternell mentioned the RICD Program and suggested the state should protect recreational values in rivers that do not currently have RICD protection with a water right or protective measure that goes beyond RICD's. Amy Beatie believes adequate protections for recreational flows are in place because the Colorado Supreme Court acknowledged recreational use as a beneficial use. Beatie posited to the extent that recreational flows are "important to communities, they may be appropriated just like any other water right for a beneficial use." Justice Hobbs opined on the matter of recreational flows stating, "we should be optimistic." Hobbs does not believe Colorado needs to amend its constitution to address issues arising from recreational flows because he trusts the minds of the next generation to create new policies that serve all water users.

Some themes emerged throughout the afternoon of speakers as they discussed the ISF Program in the context of Colorado water law. Speakers stressed the ISF Program's balance and flexibility as its strong points and highlighted Colorado's role in water rights innovation. The concern about recreational flows and the RICD Program demonstrates the next horizon of innovation for instream water rights. Hobbs', Eklund's, and Beatie's optimism and enthusiasm for the future of water law and policy in Colorado left many attendees with a smile as they trickled downstairs for the reception.

Emily Dowd

COLORADO WATER CONGRESS ANNUAL CONFERENCE 2014: OUR WATER PLATFORM

INVESTING IN PUBLIC WATER EDUCATION

Denver, Colorado January 29-31, 2014

The Colorado Water Congress held its annual convention at the end of January at the Hyatt Regency Denver. On the last morning of the convention, Nicole Seltzer, the Executive Director of the Colorado Foundation for Water Education, moderated a four panel discussion titled "Platform Plank V: Investing in Public Water Education." The discussion focused on effective ways to engage citizens in the water permitting process. Seltzer explained the importance of educating the public to help make them a partner in problem solving. The panelist included Rick McCloud, the Water Resources Manager of the Centennial Water and Sanitation District; David Nickum, the Executive Director of Colorado Trout Unlimited; Brian Werner, the Public Information Officer of Northern Water; and Lurline Curran, County Manager of Grand County. The four panelists represented a range of perspectives and commented on effective ways to facilitate public input. They each commented on the purpose of public involvement, the issues associated with public communication, and suggested ways to make public communication in the permitting process more effective.

Rick McCloud of the Centennial Water and Sanitation District spoke of his challenges and victories with public engagement in the Chatfield Reallocation Project, a project aimed at expanding the Chatfield Reservoir. McCloud acknowledge that the federal requirement is the underlying reason for public involvement in the water permitting process. However, his team also realizes that their projects impact people and it is in the organization's self-interest to receive public input from people who have superior knowledge. McCloud admitted that it is often challenging to have meaningful public involvement because there is frequently a great disconnect in communicating some of the fundamental issues of a project. When such disconnect arises, people tend to make untrue conclusions about the plan, he noted.

To ameliorate communication issues, McCloud suggested agencies should engage the public more than the required federal minimum. There should be open, honest, and straightforward attempts to involve the public early because the days of backroom decisions are over. McCloud implemented his suggestions in the Chatfield Reallocation Project. Because Chatfield is such a beloved and highly visited Colorado park, McCloud said they made it their mission to inform the public early and often so their plans to alter the park would not surprise the park visitors. His team created a public relations program where they handed out flyers to park visitors, posted signs in the park, created a website, and also managed a hotline for people to call and comment about the project. McCloud also stated they held a series of monthly meetings to discuss the mitigation plans for the park, and four out of the five environmental firms found reasons to support the project.

David Nickum of Trout Unlimited represented the public interest group voice among the panelists. He spoke to how groups like his involve citizens in the water permit process. Nickum noted that public interests groups allow a large number of people to organize and let the interest groups publicly reflect their values. He explained that involving the people who live near a proposed project in the permitting process is extremely important. Those are the people who will care the most and give the greatest insight because they see the area on a day-to-day basis.

Nickum also highlighted the lack of dialogue present in the federal permitting process. He stated that the federal requirements provide a "propose and respond" kind of process, where people just submit comments and the agency responds. When asked about potential solutions to more effectively engage the public, Nickum suggested the integrated licensing process is a good model because it frontloads the public input. Getting the public involved early helps navigate what issues require closer study. This process is also beneficial because it encourages public dialogue and helps the agency seem more credible to the public. Additionally, he noted, the more public engagement before triggering the National Environmental Protect Act ("NEPA"), the quicker the NEPA process runs.

Brian Werner of Northern Water has worked with the public agency for 32 years and spoke of his experience with public involvement on the Windy Gap Project. The purpose of public involvement is to figure out how to make projects better. Also, Werner remarked, "the public gets us to a place where we can build the project."

For Werner, the length of permitting process is the most frustrating aspect

with regards to public involvement. He explained the difficulty of keeping the public engaged for ten years on the same project. Werner also discussed the challenges associated with public misinformation. In addition to the public often getting wrong details about a project, citizens do not realize that the federal agencies dictate the process, and state agencies do not have as much leeway and control in the process as the public thinks.

When asked about potential solutions for the public communication struggles, Werner noted that there has to be a better way to do the Environmental Impact Statement ("EIS") process. Werner would like to see a briefer and more simplified process as well as shorter and more easily understandable documents to facilitate public comment. Additionally, Werner thinks that there needs to be more coordination during the comment period because there is a lot of cherry picking by the various agencies.

Lurline Curran, County Manager of Grand County, primarily commented on her experience working with the public on the Windy Gap Project. Public involvement facilitates the permitting process, Curran explained. Once the locals approve a project, the federal process flows more smoothly.

Curran also discussed some of the downfalls of the federal permitting process as well as other challenging aspects with public communication. Specifically, Curran mentioned that the EIS process eliminates the public dialogue. People send in their comments, and although the agency might answer them on one page in their report, the EIS excludes an actual interchange. She believes that Grand County found a solution to the limited dialogue present in the federal setting and created a template for how groups should work with the public. Curran credits the 1041 permitting process with helping achieve necessary dialogue that lets all people feel like the permit issuer heard them. For example, in Grand County when the staff presents their recommendation for a project, the people in the audience get a chance to make statements in response in a town hall setting.

To Curran, the most frustrating part of public communication is trying to determine how to communicate with all groups in a way that they feel secure in a process with lag time between the various steps. To keep the public informed, Grand County developed a list with everyone who wants to receive information about the Windy Gap Project, and sent those individuals updated information. If you really want public input, Curran notes, you have to be willing to take the time to get it.

Despite the varying backgrounds of each panelist, Rick McCloud, David Nickum, Brian Werner, and Lurline Curran all found that public participation, if approached correctly, could enhance the water permitting process.

Elizabeth Kutch

MANAGING FINANCIAL RISK TO SECURE OUR WATER FUTURE

Building on the framework adopted at the first Colorado Water Congress in 1958, this year's annual convention addressed six important issues affecting the development of the Colorado Water Plan. The Water Congress refers to each issue as a "plank." The convention featured moderated panel discussions

on each plank, which included (i) ensuring a strong water program for Colorado, (ii) constant reappraisal of the strength of Colorado's position in respect to its interstate water obligations, (iii) the importance of hydropower to Colorado's water policy, (iv) allocating funding for flood mitigation, (v) the necessity of investing in public water education, and (vi) ideas for managing financial and political risk in order to fund water projects. Together, these planks serve as the Colorado Water Congress's "platform for action."

The final panel of the three-day convention tackled the issue of managing financial risk. Mike Brod of the Colorado Water Resources and Power Development Authority moderated a discussion of how calculated political and financial risks are sometimes necessary to build new water infrastructure.

The first panelist, John Entsminger, General Manager of the Southern Nevada Water Authority ("SNWA"), discussed how SNWA solicits the input of the community before making short and long-term decisions regarding the financing of water infrastructure projects. Formed in 1991, the SNWA addresses southern Nevada's unique water needs on a regional scale. The SNWA also manages the Southern Nevada Water System, which includes facilities used to pump, treat, and deliver Colorado River water from Lake Mead to the Las Vegas Valley.

At the beginning of the 1900s, the small community of Las Vegas claimed it had an inexhaustible artesian supply of water in an attempt to persuade people to move there. Eventually, rising population and limited supplies required that the city take significant steps to address growing water shortages. In response, Las Vegas predominantly turned to the Colorado River to supplement the city's diminishing groundwater supply.

By 2000, southern Nevada had nearly exhausted its share of water from the Colorado River. When drought struck in the 2000s, the people of southern Nevada watched as their primary water supply, the Colorado River, dramatically diminished in flow. From 2000 to 2014, the water level of Lake Mead dropped more than one hundred feet, with current levels around 1,106 feet. SNWA anticipates water levels will drop an additional twenty feet in 2014. Consequently, the first water intake (located at 1,050 feet) will likely be out of service in the near future. When this happens, the second intake (located at 1,000 feet) would be insufficient to continue uninterrupted delivery of water to the Las Vegas Valley. As a result, in 2008 SNWA began installing a third intake at 860 feet. This marvel of engineering, however, comes with an $850 million price tag. Entsminger stated that neither federal nor state government showed a willingness to assist in covering this cost, which, of course, placed the financial burden for the project squarely on southern Nevada consumers.

According to Entsminger, the key to gaining community support for water infrastructure projects such as the Lake Mead intake is to involve stakeholders in policy and program directives. In 2012, SNWA created a committee of residents, business owners, school directors, and representatives of the gaming and golf industries to help guide future water resource planning. The task given to this "Integrated Resource Planning Advisory Council" ("IRPAC") was to figure out the best way to allocate costs for the Lake Mead intake and other projects. For example, one of the biggest concerns for the committee was ensuring that Las Vegas' large population of fixed-income seniors could adjust to any proposed increases in their water bills.

For years, developers essentially subsidized these sorts of water infrastructure projects through new connection and construction fees. When economic recession hit in 2008, these subsidies dried up. For example, in 2005-06, SNWA collected $188 million in connection fees from developers. By 2011, this income dropped to $11 million. As a result, it became imperative to find new funding sources. In 2012, at the recommendation of IRPAC, SNWA instituted an infrastructure charge that imposed a fee on every water user regardless of their level of consumption.

Entsminger added that, in addition to the infrastructure fee, a significant amount of funding comes from sales taxes, commodity charges, and connection charges. Despite the addition of the infrastructure charge and other fees, SNWA is proud to offer its customers lower water rates than many large metropolitan areas, including Santa Fe, San Diego, Phoenix, and Seattle.

SNWA is also employing conservation measures to address the water shortage. For example, SNWA is currently paying residents to remove turf from their yards. SNWA has spent $195 million on this project since 1995. According to Entsminger, conservation is a double-edged sword and an upside-down business model. On the one hand, the water authority has spent millions of dollars encouraging people to stop using the product they are selling. However, in return, SNWA experienced the benefits of reducing consumptive use of the Colorado River by one-third even as the population grew by twenty-five percent.

Next, Steve Hogan, Mayor of the City of Aurora, discussed Aurora's approach, which focused less on direct citizen input and more on leaders who are willing to make tough political decisions for the benefit of the city as a whole. Mayor Hogan explained that much of Aurora's past mirrors that of Las Vegas. Aurora draws water from three river basins and stores it in a dozen different reservoirs in the plains and mountains. In addition, Aurora's water system, like SNWA's, is only about fifty years old.

In 2002, as a result of rapid population growth and a multi-year drought, Aurora found itself with just a nine-month supply in its system. As a result, the Aurora City Council directed Aurora Water to ensure it was capturing all of the water that the city legally owned. The challenge was to find the most sustainable, cost-effective way to deliver water to the city. The result was Prairie Waters, a state-of-the-art water recycling and purification system that allows the city to draw South Platte River water, which is then filtered through sand and charcoal filters and eventually piped thirty-four miles to a treatment facility. Prairie Waters delivers an additional ten thousand acre-feet of water per year, an increase of approximately twenty percent.

The Prairie Waters Project took five years to complete and cost the city $660 million. Much like the Lake Mead project, neither federal nor state government contributed financial support to the project. To pay for the project, the city raised residential water rates and tap fees and also issued $450 million in bonds. Unlike SNWA, however, elected officials, rather than water consumers, made most of the decisions regarding how to finance the project.

Hogan pointed out that, unlike some municipal water suppliers, Aurora Water is a part of the city government. This means that eleven citizens sitting on the City Council have control over water policy decisions. According to

Mayor Hogan, while the Prairie Waters project had *some* community input, overall it was a political decision to go ahead with the project. While Mayor Hogan recalled debates over whether developers should pay their own way, he noted that the city ultimately paid for most of the Prairie Waters Project through increased water rates. The Aurora City Council has since received numerous complaints about increased water rates. According to Mayor Hogan, there are ongoing discussions about water rates in Aurora, but he noted that opinion on what constitutes an appropriate water infrastructure charge changes along with shifts in the city's political landscape.

Hogan further explained that while government staff input and recommendations are important, politics still play an important role in these decisions. Mayor Hogan emphasized the importance of having "project-specific leadership." In other words, having a knowledgeable spokesperson who can deliver accurate information to the public will make these tough political decisions easier on the community as well as on the City Council.

Overall, Entsminger and Hogan provided a good discussion of the differences, but also similarities, of their financial approaches to infrastructure improvements. Their discussion highlighted the major methods of securing funding for such projects, but also exposed the need for each water district or agency to tailor their methods to their specific situation and needs.

Gina Tincher

COURT REPORTS

FEDERAL COURTS

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Ark. Game & Fish Comm'n v. United States, 736 F.3d 1364 (Fed. Cir. 2013) (holding in part that there was sufficient evidence to find that (i) the Army Corps of Engineers' decision to increase water releases over a seven-year period caused damage to valuable hardwood trees, (ii) the damage was foreseeable, and (iii) the flooding caused by the releases was sufficient in duration and severity to establish a temporary flowage easement constituting a compensable Fifth Amendment taking).

The Arkansas Game and Fish Commission ("Commission") owns the Dave Donaldson Black River Wildlife Management Area ("Management Area"), a large parcel of land along the Black River in northeastern Arkansas. The Commission uses the area as a timber resource and a wildlife and hunting preserve. Three main species of hardwood trees populate the Management Area: nuttall oaks, overcup oaks, and willow oaks. These valuable species of hardwood trees can withstand short periods of flooding during the growing season, but not more than two or three successive seasons of prolonged flooding.

In the 1940s the Army Corps of Engineers ("Corps) built the Clearwater Dam upstream of the Management Area to provide flood control. The Clearwater Lake Water Control Manual ("Manual"), which set the policy for water releases from the dam into the Black River, attempted to mimic the natural flow of water in the Black River while preventing severe floods. Under this policy, the floodwaters downstream of the dam usually receded by late May of each year and did not interfere with the tree-growing season from April to October.

The Manual reserved to the Corps the right to approve deviations from the normal pattern of water releases. Consequently, in 1993 the Corps approved a series of deviations modifying the release times in response to requests from agricultural interests seeking to provide farmers in the flood-affected regions with a longer period of time to harvest their crops. The deviations resulted in an increase in the number of days that portions of the Management Area flooded during the growing seasons from 1994 to 2000.

The Corps continued to implement the new policy until 2000 in spite of the Commission's complaints starting in 1996 that the extended flooding was damaging some of the valuable hardwoods. In 1999 and 2000 the area suffered a moderate drought. After the drought, the Commission found that large numbers of their most valuable hardwood species were dead or degraded. The Commission asserted that the extended periods of flooding between 1994 and 1998 damaged the root systems of the trees so that they were not able to withstand the drought.

In April 2001 the Corps decided to end the deviations altogether instead of adopting them permanently. The Corps noted that the deviations had caused the Management Area to flood frequently during the previous six years, and it stated that it was abandoning the deviations because of concern for the "potential for damage to the bottomland hardwoods" in the Management Area.

The Commission originally brought this action in the Court of Federal Claims ("claims court") alleging that the Corps' water release practices between 1993 and 2000 constituted a compensable Fifth Amendment taking. The claims court agreed and found that (i) the post-1993 deviations constituted a temporary flowage easement over the Management Area, (ii) the extended periods of flooding in parts of the Management Area were foreseeable, and (iii) the floods were the cause of the damage to the timber in those areas. The claims court accordingly awarded the Commission about $5.6 million for the value of the timber lost plus approximately $176,000 in damages to pay for regeneration efforts in areas where wetland plant species had invaded as a result of the flooding.

The Unites States Court of Appeals for the Federal Circuit ("court") originally reversed, holding that the government's actions did not constitute a compensable taking. The court relied on several Supreme Court cases suggesting that temporary flooding did not constitute a compensable taking.

On appeal, the United States Supreme Court reversed the court's decision. The Supreme Court held that government-induced flooding can constitute a compensable taking even if it is temporary in duration. The Court held that to determine whether a taking has occurred, a court must consider (i) whether authorized government action caused the injury, (ii) whether the injury was a foreseeable result of that action, and (iii) whether the injury constituted a sufficiently severe invasion that interfered with the landowner's reasonable expectations as to the use of the land. Because the government challenged several of the claims court's factual findings, the Supreme Court remanded the case for further proceedings.

On remand, the court addressed the government's arguments as to duration, causation, foreseeability, and severity.

The court first addressed the government's contention that the deviations were "temporary and ad hoc" and therefore did not constitute a compensable taking of the Commission's property. The court noted that in light of the Supreme Court decision that a physical taking could result from temporary flooding, the government's argument was necessarily limited to whether the flooding was sufficient in duration to constitute a taking. The government argued it renewed the deviations on a yearly basis and designated them as temporary, meaning they were not part of a multi-year plan. However, the court concluded that because the yearly deviations had a single purpose and a consistent impact on the Management Area, the proper characterization of the invasion was that it lasted for seven years. Thus, the court also held this was a sufficient duration to subject the government to takings liability.

Second, the court addressed the government's argument that the claims court erred in finding that the deviations caused a significant increase in the burden of flooding on the Management Area. The court concluded that while there was conflicting evidence on causation, there was sufficient evidence in the

record to support the claims court's conclusion. Specifically, the court noted testimony by the Commissioner's expert that (i) the deviations, and not any other occurrence, were the direct causes of the flooding, and (ii) the flooding, and no other factor, was the direct cause of the damage to the Commission's timber. Additionally, the court noted evidence in the record that in 2001, following a site visit to the Management Area, the Corps itself admitted that the deviations had "clear potential for damage to bottomland hardwoods."

The Court next addressed the government's argument that the Corps did not intentionally flood the Management Area and that the flooding was not a foreseeable result of the deviations. The court upheld the claims court's conclusion that a reasonable investigation by the Corps prior to implementing the deviations would have revealed that the deviations would result in a significant increase in the number of days of flooding in the Management Area. The court again pointed to the Corps' own investigation and conclusion in 2001 not to make the deviations permanent and agreed with the claims court that, had the Corp conducted such an investigation prior to implementing the deviations in 1993, it would have reached the same result.

Finally, the court addressed the government's two severity arguments. First, the government argued that the marginal increase in flooding did not constitute a sufficiently severe invasion of the Commission's property rights to support a claim for compensable taking. The court upheld the claims court's decision that the government's intrusion was sufficiently severe to uphold a takings claim. The court pointed to the claims court's factual findings that after the deviations began the flooding lasted for significantly longer periods of time and had more serious consequences than pre-deviation flooding. The Court also relied on the Supreme Court's conclusion, based on those factual findings, that the deviations deprived the Commission "of the customary use of the Management Area as a forest and wildlife preserve."

Second, the government argued that the effect of the flooding was irrelevant to the question of whether the governmental action itself—making deviations that resulted in additional flooding—constituted a taking. The court disagreed and stated that a consideration of the effects of an intrusion is often necessary to determine whether a particular intrusion is sufficiently severe or only incremental in nature.

Lastly, the court addressed the Commission's argument that the claims court erred in its calculation of damages. The Commission argued that invasive wetland species took hold in parts of the Management Area as a result of the flooding, and that the court should have granted additional damages for the regeneration of these lands. The Commission asserted that 6,641 acres were in need of regeneration, but the claims court only awarded regeneration damages for the 349 acres on which the Commission characterized the timber damage as "severe." For the remaining acres, the claims court found that the Commission had not established the need for regeneration "to a reasonable certainty."

The Commission put forward two main arguments. First, the Commission argued that a plaintiff bears the less exacting burden of proving "a fair and reasonable approximation" of damages and, therefore, the claims court applied an unduly heavy burden. The court held that the principle of reasonable certainty, just like the Commissions proposed test, would not require a plaintiff to prove

the precise amount of damages; both tests require the plaintiff to show the amount of damages to a reasonable approximation.

The Commission also argued that the evidence that the claims court relied upon in granting damages for the 349 acres was not materially different than the evidence with regard to the remaining portions. The court noted that the claims court found that the Commission had not presented adequate evidence to differentiate which of the remaining acreage would require regenerative work and which retained oak stands that may well regenerate themselves. The court held that the claims court did not commit clear error in finding that the Commission failed to meet its burden in this regard.

Accordingly, the court affirmed the claims court's original ruling that the government took a temporary flowage easement over the Management Area that constituted a compensable Fifth Amendment taking, and upheld the claims court's calculation of damages to the Commission.

Dale Ratliff

UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF CALIFORNIA

San Luis & Delta-Mendota Water Auth. v. Jewell, No. 1:13-CV01232-LJO-GSA, 969 F.Supp 2d 1211 (E.D. Cal. Aug. 22, 2013) (lifting a Temporary Restraining Order and denying a motion for preliminary injunction, thereby permitting the United States Department of the Interior to perform flow augmentation releases of water from Trinity Reservoir to combat a potential parasitic fish kill).

San Luis & Delta-Mendota Water Authority and Westlands Water District ("San Luis") sought to enjoin the United States Department of the Interior and Unites States Bureau of Reclamation ("Interior") from making flow augmentation releases of water from Trinity Reservoir to the Trinity and Klamath Rivers in California. The Trinity River Division ("TRD"), a component of the Central Valley Project, dams the Trinity River at Trinity Reservoir. The Klamath Project dams the Klamath River. The court noted that the construction and operation of these projects had severely altered the environment and degraded fish habitat. The United States District Court for the Eastern District of California ("court") originally issued a Temporary Restraining Order ("TRO"), which prevented the flow augmentation until the court had an opportunity to consider whether to convert the TRO into a preliminary injunction.

To evaluate San Luis' motion for preliminary injunction, the court turned to the injunction test found in *Winter v. Natural Resources Defense Council, Inc.* That test states a party seeking an injunction must show (i) it is likely to succeed on the merits, (ii) it is likely to suffer irreparable harm in the absence of relief, (iii) the balance of equities tip in its favor, and (iv) an injunction is in the public interest.

Interior claimed the purpose of the flow augmentation was to reduce the likelihood and severity of a fish kill in 2013. San Luis argued that Interior (i) did not have authority to make flow augmentation releases in excess of those permitted by the Central Valley Project Improvement Act ("CVPIA"); (ii) failed

to comply with CVPIA and 43 U.S.C. § 383 (2012) by not obtaining an amendment to the approved place of use of the water Interior planned to release under its plan; and (iii) failed to adequately evaluate the flow augmentation's environmental impacts under the National Environmental Policy Act ("NEPA").

The court addressed each of these claims in the context of San Luis' likelihood of success on the merits. Ultimately, however, the court declined to issue definitive rulings on these issues, reasoning that a *lack* of likelihood of success on the merits was not a prerequisite to refusing relief. First, the court addressed Interior's authority to make the flow augmentation releases under CVPIA. San Luis argued the daily flow volume in Trinity River was subject to maximum and minimum limits, and more water directed to instream uses, as opposed to transferred to the Sacramento/San Joaquin basin, resulted in greater environmental impacts to the Trinity River. Conversely, Interior pointed out that implementing the flow augmentation was within its discretionary authority to benefit certain fish populations and satisfy the Interior's trust responsibility to various Indian tribes that rely on the fish populations in question. The court found both of these arguments colorable but ultimately declined to issue a definitive ruling on Interior's authority under CVPIA.

Second, the court declined to resolve the issue of whether state law required Interior to obtain permission from the California State Water Resources Control Board ("SWRCB") to change the place of use of the water. The court noted in passing that the contradiction between the language in California's water code—which suggested Interior needs a permit—and language in a prior SWRCB letter—which stated a similar flow augmentation plan would be consistent with Interior's existing permits—made the state water law issue a close question.

Third, Interior conceded that NEPA applied to the impacts of the flow augmentation plan. The court stated that the Environmental Assessment evaluating the impacts of the flow augmentation was arguably not in conformity with previous rulings because it gave little attention to the potential environmental impacts of reduced water supplies to water users in the Sacramento San Joaquin Basin. However, the court refused to issue injunctive relief on this point because doing so could cause more environmental harm than it would prevent.

The court then went on to address the potential for irreparable harm by balancing the environmental harms, which the flow augmentation plan sought to prevent, against San Luis' economic interest in the water. The proposed flow augmentation would operate Trinity Reservoir to target a minimum flow of 2,800 cubic feet per second ("cfs") in the Klamath River, subject to environmental and biological conditions. Interior estimated that the flow augmentation plan would utilize about twenty thousand acre-feet ("af") of water, although previous worst-case scenario estimates indicated up to 109,000 af would be necessary. In terms of San Luis' interest, the court agreed that all additional water San Luis could obtain would help alleviate economic and environmental harms due to a lack of water within its service area. The court also noted there existed a contingent potential for irreparable harm to San Luis, as a tunnel used to re-divert water from Trinity Reservoir was of limited capacity, thus reducing the cumulative volume of water Trinity Reservoir could hypothetically deliver when accounting for the following summer. The court alluded to the fact that although

the conditions facing San Luis were dire, the flow augmentation plan did not cause the drought affecting San Luis because it already faced shortage due to storage deficits and its junior priority in the Central Valley Project. Nonetheless, the court found it undisputable that the flow augmentation would diminish San Luis' total allocation.

To analyze the balance of the equities, the court next examined the potential for environmental harm if the court enjoined the flow augmentation. The court was particularly interested in expert witnesses who could explain the scientific basis for the flow augmentation. The purpose of increasing the amount of water using the flow augmentation plan was to prevent fish die off as a result of an Ich parasite outbreak. The court noted that an Ich parasite outbreak is less likely to occur when water velocities are greater and fish population densities are lower. In 2002 a large fish kill had severe impacts on commercial fishing interests, tribal fishing rights, and the ecology of the Klamath River. Experts agreed that in 2002 there were remarkably low flows, crowded fish conditions, migration delays, and relatively high temperatures.

Noting the importance of preventing an Ich outbreak given the difficulties in addressing an outbreak once it takes hold in a population, experts testified that the flow, fish density, and temperature components of the augmentation plan were particularly important issues. Historically, there had only been two years on record in which flows dropped below 2,500 cfs: in 2002 (when a fish kill occurred) and in 1988 (when no fish kill occurred, potentially due to a relatively high level of fish harvest that might have minimized fish density and lowered the likelihood that the Ich parasite could transfer from fish to fish). The court accepted the experts' opinion that flows of 2,500 to 2,800 cfs were the minimum required to reasonably prevent an Ich outbreak. Ultimately, the court found t the balance of potential harms tipped in favor of Interior, and it was in the public interest to permit the flow augmentation.

Finally, the court held that although both parties' positions implicated significant public interests, neither party held veto power over the other. Nevertheless, upon balancing the projected decreased volume of water and the risk to fish populations of doing nothing, the court found that it was in the public interest to allow the augmentation to proceed.

Accordingly, the court denied San Luis' request to convert the TRO into a preliminary injunction, lifted the TRO, and permitted the flow augmentation to proceed.

Nicholas Rising

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF NEBRASKA

Frenchman Cambridge Irrigation Dist. v. Heineman, 974 F.Supp. 2d 1264 (D. Neb. 2013) (holding the United States District Court for the District of Nebraska lacked proper subject matter jurisdiction because state law governs water rights and therefore declining to exercise supplemental jurisdiction).

The plaintiffs included two political subdivisions in Nebraska, three farmers, various landowners, and water-use patrons of those political subdivisions

("Irrigation Districts"). The defendants were N-CORPE and Upper Republican Natural Resources District ("DNR"); Brian Dunnigan and Dave Heineman ("State Defendants"); Michael Connor, Michael Ryan, Kenneth Salazar, the United States Department of Interior, and the United States of America ("Federal Defendants"). The Irrigation Districts filed a complaint challenging a proposed plan to pump groundwater to surface water streams as a means to correct an alleged overuse of Nebraska's allocation of water under the Interstate Compact. The Irrigation Districts sought a determination of water rights in the Republican River Basin ("RRB"), an order compelling Federal Defendants to protect French Cambridge Irrigation District ("FCID") water rights, and an injunction compelling State and Federal Defendants not to interfere with those water rights.

The Interstate Compact allocated a specific number of acre-feet to each state on a basin-by-basin basis. The Irrigation Districts' first claim for relief argued the DNR's proposed plan unlawfully prioritized water use and bypassed federal lakes and reservoirs. The second claim for relief alleged the State Defendants overused their water allocation and made improper transfers. The third claim for relief argued the State Defendants continued to overuse the groundwater and sanction such conduct. The fourth, fifth, and sixth claims alleged the Federal Defendants breached the obligations required by contract because they failed to assure a supply of water, failed to actually supply water, and failed to protect priority surface water rights.

The Federal Defendants moved to dismiss the claim for lack of subject matter jurisdiction. Also, the Federal Defendants argued that the United States did not waive its sovereign immunity and that the complaint failed to state a claim. Similarly, DNR moved to dismiss for failure to state a claim and lack of subject matter jurisdiction. DNR also asserted Eleventh Amendment immunity and that the court should not exercise supplemental jurisdiction over the Irrigation Districts' state law claims. Finally, DNR claimed the Irrigation Districts lacked standing to initiate the claim. The State Defendants moved to dismiss for failure to state a claim and for lack of subject matter jurisdiction. The State Defendants also asserted Eleventh Amendment immunity and that the court should not exercise supplemental jurisdiction.

If a court lacks subject matter jurisdiction then the court must dismiss the claim. A complaint must plead enough facts to state a claim for relief that is plausible on its face. In order to sue the United States, the Irrigation Districts must show both a grant of subject matter jurisdiction and a clear statement waiving sovereign immunity. The McCarran Amendment articulated the policy of the federal government to make state courts the primary forum for water rights adjudications.

The Eleventh Amendment shields States from suit in federal court without their consent, forcing parties to present the claims in State courts, if the State permits. If the District Court has original jurisdiction over a claim, it may exercise supplemental jurisdiction. However, if a court dismisses all federal claims or if there is an ongoing, parallel state court proceeding, a court will decline to exercise supplemental jurisdiction.

First, regarding the claims against the Federal Defendants, the United States District Court for the District of Nebraska ("court") noted that the dispute involved appropriation or apportionment of water resources, which is a matter of state law. State law governs water apportionment and the Federal Defendants did not have a corresponding obligation under Federal law. Second, the court found the Irrigation Districts failed to show an unequivocal waiver of the United States' sovereign immunity because not all entities with water rights in the RRB were parties to the suit, thereby making the McCarran Amendment inapplicable. The McCarran Amendment makes state courts the primary forum for water rights claims and can waive the United States' sovereign immunity in certain state water cases. Here, the amendment was inapplicable because the Irrigation Districts advanced water rights that arose under Nebraska law and turned on an interpretation of Nebraska law. Also, the court found the Irrigation Districts failed to state a cognizable claim against the Federal Defendants because state law controlled the relevant water rights.

Having found the claims against the Federal Defendants subject to dismissal, the court declined to exercise supplemental jurisdiction regarding the State and DNR Defendants. The court reasoned that the claim involved novel state law issues and a current action was pending in a Nebraska state court. The court did not address the Eleventh Amendment immunity issues because the Irrigation Districts did not allege any federal violations.

Accordingly, the court granted the motion to dismiss all of the Irrigation Districts' claims.

Dane Mueller

UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF VIRGINIA

Precon Dev. Corp. v. U.S. Army Corps of Eng'rs, No. 2:08CV447, 2013 WL 6091882 (E.D. Va. Nov. 18, 2013). (holding (i) the Corps' extensive factual findings were not arbitrary and capricious and (ii) the Corps' ultimate determination that a significant nexus existed between the relevant wetlands and the Northwest River was sufficiently persuasive to subject the wetlands to the Clean Water Act).

This case involved 4.8 acres of wetlands ("subject wetlands") located in Chesapeake, Virginia for which Precon Development Corporation ("Precon") sought a permit to develop. The development area contained a total of 658 acres, about half of which were wetlands. 166 of the wetland acres flowed into the St. Brides Ditch ("the Ditch"), including the subject wetlands. The Ditch is a tributary, running along the western boundary of the wetlands area, flows south until it joins with the Hickory Ditch, and then both ditches feed into the Northwest River ("the river"). The second tributary to the river consisted of a seasonal relatively permanent water that ran in the southwest corner of the wetlands and flowed into the Ditch.

The United States District Court for the Eastern District of Virginia ("district court") received the case on remand from the United States Court of Ap-

peals for the Fourth Circuit ("court of appeals"). The court of appeals determined the original administrative record contained insufficient information to evaluate the United States Army Corps of Engineers' ("Corps") conclusion that a significant nexus existed between the wetland and the river. Thus, on remand, the district court examined the Corps' improved and amended record in accordance with the court of appeals' direction.

The court of appeals based their suggestions for remand upon the "significant nexus" test in Justice Kennedy's concurrence in *Rapanos v. United States.* Before remanding the case, the court of appeals provided guidance to the Corps regarding the nature of the report needed for reconsideration. The court of appeals noted that the report did not need to include laboratory tests or quantitative measurements, but could instead include qualitative evidence like expert testimony about the functions of the relevant wetlands, adjacent tributaries, and the river. The court of appeals specifically stated that the administrative record should adequately address (i) the condition of the Northwest River, (ii) the actual flow rates of the two tributaries, and (iii) the significance of that flow. The court of appeals also charged the Corps with documenting how the wetlands significantly, rather than insubstantially, affected the integrity of the navigable waters.

After the court of appeals remand, the district court also remanded the case to the Corps for additional administrative review. After the Corps developed a new record, the district court considered cross-motions for summary judgment. A magistrate judge first heard oral arguments on the motions before filing a Report and Recommendation ("R&R") with the district court. The R&R recommended that the district court grant the Corps' motion for summary judgment. Precon subsequently filed an objection to three of the R&R's findings: (i) the condition of the Northwest River, (ii) the flow of the relevant tributaries, and (iii) the function of the wetlands in relation to these tributaries and the river. The district court analyzed each in turn.

In considering the condition of the river, the district court noted that the river was an impaired body of water due to low dissolved oxygen ("DO") levels. Low DO levels are generally the result of high levels of nitrogen or phosphorus. Precon asserted that the evidence did not support a finding of excessive nitrogen because the record found only phosphorus as a nutrient of concern. As such, Precon contended that any role the Precon wetlands and similarly situated wetlands have on nitrogen cycling did not significantly impact the chemical or biological quality of the river.

The district court found that the record did not support Precon's logic. The court determined that excess nutrient inputs from the wetlands cause eutrophication, which contributes to low DO levels in the river. Further, the court of appeals previously found that the wetlands and their adjacent tributaries trap sediment and nitrogen. Based on this record, the district court made two determinations. First, the court determined that the Corps' finding that the wetlands prevent additional nutrients from reaching the river was not arbitrary and capricious because the record showed that both nitrogen and phosphorus levels were important to downstream water quality, and that the wetlands trap sediment and nitrogen. Second, the district court noted that it was not necessary for the Corps to demonstrate that there were high nitrogen levels in the river and its relevant tributaries on remand–it only needed to make general findings about the river's

impairment. Because the Corps provided evidence from both the Virginia Department of Environmental Quality and its own experts that showed that the river is an impaired body of water, the district court found that the Corps satisfied the court of appeals' mandate to consider the condition of the relevant navigable water.

The district court next considered evidence regarding the flow of the river's tributaries. The district court interpreted Precon's next objection to be that the Corps relied upon hypothetical rather than actual flow rates and, thus, such data was meaningless. However, the district court found that the Corps' reliance on hypothetical flow rates was appropriate and rational. Due to the lack of flow gauges in the river, the Corps had no actual flow rates, making a direct comparison of the flows from the river and the ditch impossible. The district court found that the Corps appropriately analyzed the available data points on the wetland and the navigable waterway and properly incorporated this information into the significant nexus determination. As the court of appeals instructed, the district court applied *Skidmore* deference and agreed that the analysis possessed the power to persuade.

Finally, the district court considered the Corps' findings regarding the functions of the wetlands in relation to the tributaries and the river. Precon argued that the Corps' experts simply expressed their opinions rather than provided quantitative and qualitative evidence to support a finding of a significant nexus. The district court found this objection meritless. The district court found that the Corps properly engaged in a lengthy discussion about the scientific validity of Precon's expert's findings and the conclusions drawn therefrom. The district court determined that Precon fundamentally misunderstood the district court's role when faced with divergent expert opinions. The district court relied upon the reasoning in *Marsh v. Oregon Natural Resource Council*, which states that courts should defer to the informed discretion of the responsible federal agencies. The Corps' administrative record also emphasized the wetlands' ability to support wildlife and the role tributaries performed in regulating water flows and quality. The district court therefore found that the Corps provided ample persuasive support for its finding of a significant nexus between the relevant wetlands and the river. The district court found that the Corps' determination was not arbitrary and capricious and that the ultimate determination of a significant nexus was highly persuasive.

Accordingly, the court adopted the magistrate judge's R&R, granted the Corps' motion for summary judgment, and denied Precon's motion for summary judgment.

Lillie Parker

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF WYOMING

United States v. Hamilton, 952 F. Supp. 2d 1271 (D. Wyo. 2013) (finding on a motion for partial summary judgment that (i) no genuine dispute existed that Slick Creek is a water of the United States subject to the Clean Water Act; but (ii) a genuine dispute of material fact existed regarding whether Hamilton's

farming activities precluded application of the Clean Water Act's recapture provision).

This is a case of first instance before the United States District Court for the District of Wyoming ("court") regarding David Hamilton's activities when he filled part of Slick Creek ("Creek") and altered the course of the Creek's progression. The Government brought suit against Hamilton under the Clean Water Act ("CWA") because Hamilton filled the Creek without first obtaining a discharge permit from the Army Corps of Engineers ("Corps"). The Government filed for summary judgment on its prima facie case. Hamilton contested two major issues: (i) whether Slick Creek is a water of the United States subject to the CWA and (ii) whether his filling activities were subject to any of the exemptions to the CWA's permit requirements.

Slick Creek is a waterway sourced mainly by irrigation runoff but also from natural rainfall and melted snow. The Creek runs from Worland, Wyoming into the Big Horn River, which flows into the Yellowstone River and eventually the Missouri River. In 2005 Hamilton diverted the Creek so that it would run through a straight channel across his property. He then filled in the Creek's previous watercourse with dirt and rock material. This allowed him to plant new crops where the Creek used to flow. The EPA subsequently discovered that Hamilton filled the Creek without the discharge permit required under 33 U.S.C. § 1311(a). The EPA then sent a compliance order to Hamilton but he refused to return the Creek to its previous condition. Consequently, the Government filed suit and sought summary judgment to compel Hamilton to restore the Creek and pay civil fines.

The court first considered whether the Government was entitled to summary judgment on the determinative issue of whether the Creek was a navigable water of the United States. The court concluded that the Creek meets the requirements of a water of the United States under the *Rapanos v. United States* plurality test because, as the Government contended, it is a "relatively permanent, flowing body of water that connects to a traditional interstate navigable water."

The court agreed with the Government because the evidence showed that the Creek had been full every year since 1962 and lacked vegetation along the waterway, as is consistent with yearly water flow. The court also concluded the Creek connected to a navigable waterway because the Creek drains into the Big Horn River, which is navigable in fact. The court rejected Hamilton's argument that the Creek was manmade because farming irrigation providing most of its water. The court noted that prior precedent—namely, *Rapanos*—establishes that manmade water bodies can be waters of the United States. Additionally, the court rejected Hamilton's argument that the Creek is not permanent because it fluctuates with farmers' irrigation activities by noting that, regardless of the changing volume of flow, the Creek flowed continuously year-round. Consequently, the court granted the Government's request for summary judgment on this issue because the Creek is navigable and therefore subject to the CWA.

The court next considered whether Hamilton was liable under the "recapture" provision of the CWA. The CWA contains exceptions for farmers carrying out normal activities and for the maintenance of irrigation ditches. Hamilton

argued his actions fell under both of these exceptions. The Government, however, argued that the CWA's "recapture" provision trumps the exceptions in this case. The CWA recapture provision requires that, even if farmers' normal activities and irrigation maintenance are exempted, they must obtain a discharge permit if such activity brings an area of the navigable waters into a new use that impairs water flow. Hamilton presented testimony that prior landowners used the filled portions of the Creek for farming activities. The court concluded that, given this evidence, it was still disputable whether the land Hamilton filled was previously farmland and, therefore, whether the recapture provision applied.

Accordingly, the court granted the Government's request for summary judgment in part and found that the Creek is a water of the United States. However, the court denied the Government's request for summary judgment on the applicability of the CWA's recapture provision.

Lauren Hammond

STATE COURTS

COLORADO

Pawnee Well Users, Inc. v. Wolfe, 320 P.3d 320 (Colo. 2013) (holding the water court erred in invalidating the Fruitland Rule based on the Tribal Rule because the General Assembly granted the State Engineer the authority to adopt rules governing nontributary groundwater extracted during oil and gas production, and the State Engineer can neither establish nor divest himself of statutory authority).

This case was an appeal from a final judgment issued in Colorado District Court, Water Division 1 ("water court"), which found that the Tribal Rule stripped the Office of the State Engineer ("State Engineer") of the authority to enact the Fruitland Rule and, thus, the Fruitland Rule was invalid. The State Engineer, the Southern Ute Indian Tribe ("Tribe"), and several other intervenors appealed to the Supreme Court of Colorado ("Court").

In *Vance v. Wolfe*, the Court held that water extracted during the course of coalbed methane ("CBM") production was subject not only to Colorado Oil and Gas Conservation Commission ("COGCC") regulations, but also to both the Water Right Determination and Administration Act of 1969 and the Colorado Ground Water Management Act ("Ground Water Act"). The Court's holding in *Vance* required the State Engineer to evaluate and potentially issue permits for more than 40,000 existing oil and gas wells within sixty days of the decision.

To alleviate the situation, the General Assembly passed House Bill 09-1303 ("H.B. 1303"), which gave the State Engineer authority under the Ground Water Act to adopt rules to administer the "dewatering of geologic formations by withdrawing nontributary groundwater to facilitate or permit mining of minerals." H.B. 1303 also afforded the State Engineer additional time to evaluate the wells and issue permits.

The State Engineer held public meetings and then filed a notice of proposed rule making. The notice of proposed rules included the State Engineer's

intent to designate certain geologic formations as nontributary, which would mean that the groundwater within those formations would not fall within the state prior appropriation system. The notice of rulemaking allowed interested parties to propose alternate rules. The Tribe and various oil and gas operators proposed a rule that identified groundwater in the Fruitland Formation, which extended into the Southern Ute Indian Reservation ("Reservation"), as nontributary. This rule ultimately became the Fruitland Rule.

Because the Fruitland Rule included land inside and outside of the Reservation's boundaries, jurisdictional issues arose. Accordingly, the Tribe proposed the Tribal Rule, which stated that the rules "shall not be construed to establish the jurisdiction of either the State of Colorado or the Southern Ute Indian Tribe over nontributary groundwater within the boundaries of the Southern Ute Indian Reservation. . . ." The State Engineer agreed to adopt the Tribal Rule but maintained that the State Engineer already possessed jurisdiction over nontributary groundwater within the Reservation.

The State Engineer then filed the final Produced Nontributary Ground Water Rules ("Final Rules"), which included the Fruitland Rule and the Tribal Rule. After the State Engineer had enacted the Final Rules and had already completed evaluations for wells in the Fruitland Formation, interested citizen groups and owners of vested rights ("Pawnee Well Users") filed complaints in six water divisions challenging the validity of the Final Rules. The Multidistrict Litigation Panel consolidated the complaints in the water court.

The water court upheld all of the Final Rules except the Fruitland Rule, which it found invalid. The water court found that (i) the Tribal Rule divested the State Engineer of his authority to enact the Fruitland Rule, (ii) the State Engineer was not authorized to issue the rule as an advisory rule, and (iii) the State Engineer needed to obtain a judicial determination of his authority in order to enact the Fruitland Rule. The State Engineer, the Tribe, and other intervenors appealed.

The Court first addressed whether the Tribal Rule divested the State Engineer of authority to enact the Fruitland Rule. The Court held that the water court erred on this issue, reasoning that the Tribal Rule could not take away the State Engineer's statutory authority to promulgate the Fruitland Rule. The Court explained that the State Engineer could neither establish, nor take away, his own jurisdiction because the State Engineer is a state agency that only has the powers that the legislature expressly gives it. Therefore, only H.B. 1303, not the Tribal Rule, gave authority to the State Engineer, including the authority to enact the Fruitland Rule.

The Court subsequently set aside the remainder of the water court's order that dealt with the Fruitland Rule. First, the Court disagreed with the water court's holding that the Fruitland Rule was "advisory" based on the absence of authority given to the State Engineer by the Tribal Rule to enact the Fruitland Rule. The Court reasoned that the Fruitland Rule was not "advisory" because H.B. 1303 specifically granted the State Engineer the authority to promulgate the Fruitland Rule. Also, the Court rejected the water court's conclusion that the State Engineer must obtain a judicial determination of its authority in order to enact the Fruitland Rule because the Tribal Rule could not—and therefore

did not–divest the State Engineer of his statutory authority to promulgate the Fruitland Rule.

The Court also rejected Pawnee Well Users' argument that the State Engineer may fail to administer nontributary water on the Reservation because the Tribal Rule divested the State Engineer of his jurisdiction over nontributary ground water within the reservation. The Court rejected this argument on the grounds that, logically, the State Engineer would not delineate nontributary groundwater with the Fruitland Rule only to decline to administer it by promulgating the Tribal Rule.

Accordingly, the Court held that the water court erred in invalidating the Fruitland Rule based on the Tribal Rule and reversed and remanded the case for further proceedings. In a footnote, the Court pointed out that a party could still bring an as-applied challenge to the State Engineer's implementation of the Fruitland Rule.

Brock Miller

Yellow Jacket Water Conservancy Dist. v. Livingston, 318 P.3d 454 (Colo. 2013) (holding the Water Conservancy Act's holdover provision, containing neither temporal nor reasonableness requirements, allowed district's holdover directors to remain in office past their original term as de jure officers with authority to act on behalf of the district).

The Yellow Jacket Water Conservancy District ("Yellow Jacket") held conditional water rights to several bodies of water located in northwest Colorado. Yellow Jacket's board of directors met on September 29, 2009, and authorized the filing of diligence applications with the water court. On the date of the meeting, Yellow Jacket's board of directors, normally a nine-member panel, had one vacancy as well as four directors whose terms had expired but who were still performing their official duties pending the appointment of qualified replacements. After reviewing Yellow Jacket's diligence applications, several parties (hereinafter "Livingston") objected to the board's authority to approve the filing of these documents. Livingston argued that Yellow Jacket could not have assembled a valid quorum because only three of the nine directors were serving unexpired terms on the date of the board meeting. Livingston filed for summary judgment asking the Rouyt County District Court, Water Division 6 ("water court") to cancel Yellow Jacket's conditional water rights.

Although the water court recognized that Colorado's Water Conservancy Act ("WCA") contained a holdover provision, the court relied on case law from other states to find that the four holdover directors had remained in their positions for an unreasonable amount of time past the expiration of their terms. The four holdover directors' terms expired on October 18, 2008, nearly one year before the board meeting. Consequently, the court found that Yellow Jacket's board had not assembled a valid quorum and lacked the authority to approve the filing of the diligence applications. The water court granted Livingston's motion for summary judgment, deeming Yellow Jacket's conditional water rights abandoned and cancelled.

On appeal, the Colorado Supreme Court ("Court") began its analysis by reviewing the purpose and procedure of WCA. In order to maintain a conditional water right, the holder is required to file an application for a finding of

due diligence every six years. These applications help ensure that the holder is continuing to work toward completion of the project that initially led to the conditionally decreed appropriation. The water court then publishes the applications, allowing interested parties to contest the continuation of these conditional water rights.

The Court next examined the holdover provision of the WCA. Looking at the plain language of the statute and construing that language according to rules of grammar and common usage, the Court found that the WCA unambiguously allows a director to hold office for the original term, as well as any interim term without limitation, pending the appointment of a duly qualified successor. The Court noted its longstanding position that when a statute provides that an incumbent may remain in office until a successor is duly qualified, the incumbent remains as a de jure officer with all the authority vested in such position. Finding no legislative intent to impose temporal or reasonableness requirements on holdover terms, the Court declined to read either limitation into the statute.

The Court held the water court had erred in its reliance on a standard of reasonableness, rather than the plain language of the holdover provision of the WCA. Accordingly, the Court reversed the water court's decision to cancel Yellow Jacket's conditional water rights and remanded the case for further proceedings.

Gina Tincher

IDAHO

In re Distribution of Water to Various Water Rights Held by or for the Benefit of A&B Irrigation District, 315 P.3d 828 (Idaho 2013) (holding (i) the Director of the Idaho Department of Water Resources may use a predicted baseline of senior water right holders' needs as a starting point in considering material injury in a water call in both the management and administrative contexts; and (ii) clear and convincing evidence is the proper evidentiary standard to meet the burden of proof for material injury).

In January 2005, senior surface water rights holders ("Coalition") initiated a delivery call alleging they had suffered material injury due to pumping by junior groundwater rights holders ("Groundwater Appropriators"). The basin serving water rights holders in this matter is of a hydrological character that groundwater pumping will have an effect on surface flows. In response to the delivery call, the Director of the Idaho Department of Water Resources ("Director") issued an initial order that described the methodology used to determine whether the senior rights holders had suffered material harm. In May 2005, the Director issued an amended order that emphasized that material injury only exists if a senior rights holder lacks sufficient water to meet its authorized beneficial uses and that this amount may differ from the total decreed or licensed right. Later in May 2005, the Director granted the City of Pocatello ("City") leave to intervene. Subsequent to the amended order, the Director issued three supplemental orders refining the methodology to calculate material harm. In April 2008, a hearing officer reviewed the Director's orders and issued an opinion and recommendation that noted the use of a baseline was a departure from the

practice of recognizing a call at the level of the licenses or decrees, and called for improvements to the methodology to make it more responsive to actual conditions. The Director adopted most of the findings of the hearing officer, but retained the baseline methodology in a September 2008 final order.

The parties petitioned the district court for judicial review of this. The district court reviewed the final order and determined that although the Director had erred on several points, the use of a baseline methodology to determine material injury was acceptable. The district court also noted that the proper evidentiary standard to evaluate material injury is the clear and convincing evidence standard. However, the Director had abused their discretion by failing to determine a methodology for material injury to reasonable in-season demand and carryover. The district court remanded the matter to the Department, and ordered the agency to produce a final order determining material injury to reasonable in-season demand and reasonable carryover. Upon issuance of the final order by the Department, the district court ruled that the abuse of discretion had been absolved through compliance with the district court's order. The Coalition appealed to the Idaho Supreme Court to review the district court's affirmation of the Director's baseline model. Groundwater Appropriators and the City also appealed on the evidentiary issue.

The district court described the methodology as using a baseline quantity independent of the decreed quantity derived from predicted flow and storage needed and using deviations from the baseline to calculate material damages. The Coalition argued the use of any baseline methodology that must predict the amount of water a senior appropriator requires to meet beneficial needs is contrary to the doctrine of prior appropriation. The Coalition stated that a decreed or licensed water right creates a presumption that the beneficial use defines the full extent of the right.

The Court noted that the water rights involved in this matter were not in dispute, making this an issue of water management rather than water rights. Idaho uses the prior appropriation framework for water rights and had previously adjudicated the water rights of the Snake River basin. Even though water rights are not at the center of the dispute, the Court has held that the director must conduct management and administration with the basic tenets of the prior appropriations doctrine in mind. The Idaho legislature granted the Director power to manage the distribution from water sources in accordance with the priorities of the rights of the users thereof. The Court recognizes that the legislature vested the Director with the discretion to implement a water allocation plan. The purpose of granting discretion to the Director in this matter is to resolve the tension between the absolute right to use a decreed water right and the obligation to avoid waste and protect an important public resource. The Court concluded that the use of a baseline methodology in the management context is consistent with Idaho law.

The administrative context presented a more challenging issue to the Court. The Director used the baseline methodology as a starting point for considering the Coalition's call for administration and for determining the issue of material injury. The Director may, under Conjunctive Management ("CM") Rule 42, consider factors relating to material waste in the context of water rights. The

Court extended the power to consider these factors to water rights administration. The Court stated that preventing the Director from considering whether a senior rights holder is putting their water to beneficial use would be to ignore the constitutional requirement that only to those using the water enjoy priority over the water. The Court also noted that the Director has discretionary authority in water management and administration cases that is not available in a water rights case. The Court reasoned that reasonableness is not an element of a water right, so evaluation of whether a diversion is reasonable in the administration context should not be a re-adjudication. The application of established evidentiary standards, legal presumptions, and burdens of proof tempers the Director's discretion. The senior rights holder is not required to prove their entitlement to the water. The rules do allow the Director to use various tools, including baseline methodology, to determine how diversion can impact other water sources.

Groundwater Appropriators and the City argued there is no basis in Idaho law to require use of the clear and convincing evidence standard as opposed to the preponderance of the evidence standard. They both requested the establishment of the preponderance of the evidence standard as the appropriate standard. The Court readily dispensed with the evidentiary issue by citing *A&B Irr. Dist. v. Idaho Dep't of Water Resources*, stating a longstanding rule that clear and convincing evidence must support changes to a decree. The Court saw no reason to change this established precedent.

The Court concluded the Director had authority to use a baseline methodology to determine whether to initiate administrative proceedings or to manage the water resources. The Court also concluded that the district court had applied the correct evidentiary standard. The Court therefore affirmed the district court ruling, and allowed the Director to proceed with the water management and administration plan.

Peter Almaas

MONTANA

Heavirland v. State, 311 P.3d 813 (Mont. 2013). (holding (i) Montana case law applies retroactively in determining sufficiency of evidence rebutting the presumption of abandonment of water rights founded on a prolonged time of nonuse, and (ii) claimants provided sufficient evidence to defeat the presumption of abandonment and excuse twenty-four years of nonuse of irrigation rights).

Frank Truchot filed and perfected the subject water right in 1904. Under this right, Truchot diverted water from Muddy Creek for irrigation. Christina and Henry Weist purchased the water right in 1913. Their son, Ray Weist, took over the farm and continued to utilize the water right for flood irrigation, when available, from the mid-1940's until 1961. Utilization of the right was particularly difficult because of the slope and heavy clay soil of the Weists' fields. Ray stopped irrigating in 1962. His son, Lyle, stated that his father's age and the inefficiency of flood irrigation were the reasons Ray stopped irrigating. Lyle also testified that Ray had three-phase power connected to the farm to accommodate potential future pivot irrigation.

Lyle returned to and purchased the family farm in 1975. After researching the farm's water rights history, in 1981 Lyle and his wife, Linda, filed a statement of claim in the Montana general stream adjudication. Lyle installed a fourteen-tower Valley Center Pivot and resumed irrigation in 1981-82. He continued to use the pivot until 1991, when he sold the water right and property to Loren and Sue Heavirland. The Heavirlands thereafter irrigated every year but one, when water was unavailable.

Lyle and Linda Weist's claim appeared in the Temporary Preliminary Decree for Basin 41O with attached Department of Natural Resources and Conservation (DNRC) issue remarks. The remarks noted that the 1962 Teton County Water Resource Survey and the 1978 USDA Aerial Photography indicated zero acres irrigated at the farm. Meetings between DNRC and the Weists did not resolve the issue remarks. DNRC Water Resource Specialist Kraig Van Voast ("water master") reviewed the documentation and found he did not have information that could resolve the lack of proof of irrigation from Muddy Creek. The water master therefore joined the State of Montana in the adjudication. The State moved for partial summary judgment regarding the issue of abandonment and the water master granted the motion. The water master found that the period of nonuse from 1962 to 1982 raised a rebuttable presumption of abandonment.

At an evidentiary hearing, the water master found the Weists had abandoned the water right, stating that the Weists' and Heavirlands' (together, "claimants") evidence did not overcome their burden to rebut the presumption of intent to abandon the water right. Claimants then filed an objection with the Chief Judge of the Montana Water Court ("water court"). Claimants presented two central arguments: (i) the law as it stood in 1973 applied to the abandonment of then-existing water rights, meaning the water master erred in retroactively applying *79 Ranch, Inc. v. Pitsch* to their existing water right; and (ii) even if *79 Ranch* applied, the claimants offered evidence sufficient to rebut the presumption and excuse the twenty years of nonuse.

The water court first held that *79 Ranch* applied to the case at hand. *79 Ranch* states that a long period of nonuse creates a presumption of intent to abandon a water right and causes the burden of explaining the nonuse to shift to the claimant. *79 Ranch* also requires a claimant present concrete facts or conditions excusing the nonuse, not just wants and wishes to utilize the right, to rebut the presumption of abandonment. The water court then applied *79 Ranch* and concluded the water master erred in not finding the evidence was sufficient to rebut the presumption of intent to abandon. The State appealed to the Montana Supreme Court ("Court").

The first question the Court examined was whether the water court correctly found *79 Ranch* applied to the abandonment of a water right that predated that case. The Court noted that the 1973 Montana Constitution, as well as the state's Water Use Act, protects "existing rights." But the Court went on to hold that *79 Ranch* did not run counter to the state constitution's protection of those rights and did not change or create new law; rather, *79 Ranch* clarified the standard for abandonment, meaning its retroactive application did not offend the claimants' rights or Montana law. Thus, the Court concluded the water court correctly held Montana law did not bar retroactive application of *79 Ranch.*

The second question the Court addressed was whether the water court properly held the claimants presented adequate evidence to show they did not intend to abandon their water right. The State argued the evidence presented was insufficient because (i) the claimants did not offer adequate evidence to show Ray stopped irrigating his property because of his age or health; and (ii) the connection of three-phase power to the property did not necessarily indicate intent to install a pivot irrigation system.

The Court held the claimants' presentation of the difficulty of flood irrigation on the property, coupled with Lyle's testimony regarding his father's age and health, were sufficient to overcome the presumption of abandonment. The Court stated there was no reason to doubt Lyle's statements about his father and the property. The Court also found Ray's installation of a pivot irrigation system was proof enough of his father's belief that Lyle would want to use that type of system. The Court also stated that Lyle's subsequent irrigation with the new system supported the notion that the Weists did not intend to abandon the water right. Weighing the evidence presented in its totality, the Court held the water court correctly concluded that the water master erred in finding a lack of sufficient evidence to rebut the presumption of intent to abandon the water right.

The Court therefore affirmed the water court's decision to apply *79 Ranch* retroactively. The Court also affirmed the water court's conclusion that the claimants presented evidence sufficient to justify the decades-long nonuse and, therefore, enough to rebut the presumption of abandonment.

Lauren Bushong

Hughes v. Hughes, 305 P.3d 772 (Mont. 2013) (holding (i) the lower court had jurisdiction to adjudicate the alleged stock water easement; (ii) partition of land does not extinguish existing water rights on other land unless the parties intended such a result; and (iii) an implied easement was the appropriate remedy to allow continued use of the stock water right).

The Supreme Court of Montana ("Court") reviewed various complaints Jack and Shirley Hughes ("Jack") filed against their son, Johnny Hughes ("Johnny"). The Tenth Judicial District Court ("lower court") consolidated Jack's complaints, which concerned money he loaned to Johnny, an alleged stock water easement following a partition of jointly-owned land, and a disputed pasture lease. The lower court found in favor of Johnny on all matters except the water rights issue. Jack appealed the non-water issues and Johnny cross-appealed the stock water issue.

These disputes arose in the wake of a falling-out between Jack and Johnny and the subsequent referee-supervised property partition. In separate deeds dated 1984, 1985, and 1986, Jack granted Johnny an undivided fifty-six percent interest in Melby Ranch but retained a life estate in the buildings and improvements. Thus, at the time of partition in 2011, Jack and Johnny owned Melby Ranch as tenants in common. In light of their falling-out, the parties engaged three referees to partition the land. Jack and Johnny agreed that Johnny would receive the section of Melby Ranch that included Flatwillow Creek although Jack had previously acquired an adjudicated water right to use Flatwillow Creek for stock water purposes. The parties agreed to fence their boundaries to better

reflect the partition. However, the parties did not specify how this partition would affect Jack's stock water right, which he used to sustain his cattle business on land not subject to the partition. In his complaint, Jack sought an easement either to allow his cattle access to Flatwillow Creek or to construct a pipe to bring water across Johnny's parcel. Johnny opposed, arguing that the partition agreement did not provide for a stock water easement.

The lower court granted Jack a water gap through the fence and over Johnny's land, but in the same order determined it lacked jurisdiction over the water issue. When the parties asked for clarification, the lower court stated it no longer had jurisdiction to grant the water gap. Johnny thereafter appealed the original order granting Jack a water gap.

After resolving the non-water issues, the Court discussed the lower court's jurisdiction and found it well-established that district courts have jurisdiction to supervise already-adjudicated water rights. Jack possessed rights to use Flatwillow Creek for stock water through J&S Family Limited Partnership. The Court also stated that, regardless of the lower court's jurisdiction over water rights, an easement is a legally distinct property right. For these reasons, the Court concluded the lower court possessed the jurisdiction to determine whether Jack held an implied easement to continue using Flatwillow Creek.

Jack argued he possessed an implied easement by existing use over Johnny's part of the partitioned land. The Court first recited the three elements for the creation of an easement by existing use: (i) prior unity of ownership of the two parcels, (ii) severance, and (iii) an apparent, continuous, and reasonably necessary use of the land for the easement-holder's beneficial use and enjoyment. Neither party disputed these factors and the Court therefore held that Jack originally owned both parcels, the partition severed that ownership, and access across Johnny's section was reasonably necessary for Jack to exercise his stock water right.

The crux of the dispute rested on whether Jack and Johnny intended Jack's use of Flatwillow Creek to continue after the land partition. Jack did not have access to any other source for stock water besides Flatwillow Creek. The Court observed that Johnny, at the time of the partition negotiations, knew Jack possessed the water right and had no other source from which to use it. The Court also noted that nothing in the record suggested Jack intended to stop using Flatwillow Creek for his cattle. The Court reasoned that if the partition excluded Jack from exercising his water rights then the partition agreement would be inequitable and could not stand. As a result, the Court held the record supported Jack's implied easement by existing use because both he and Johnny intended the stock water use to continue after severance of the two parcels.

In opposition, Johnny further argued that Jack surrendered his water rights to Flatwillow Creek when he agreed to the partition. As Johnny argued, the partition identified and valued the two parcels of land as "dry pastureland" and "irrigated land." Jack granted Johnny all of the available irrigated land, including Flatwillow Creek. As a result, Johnny argued, Jack consciously gave up his stock water right. However, the Court disagreed and found that Johnny's argument overlooked the fact that Jack's water rights benefited land not subject to the partition.

The Supreme Court therefore concluded that, by agreeing to the partition, Jack did not intend to give away his water rights used on land not included in the agreement. The Court remanded the issue to the lower court to determine the best and most equitable way to provide Jack access to Flatwillow Creek.

Allison Robinette

NEBRASKA

Middle Niobrara Natural Res. Dist. v. Dep't of Natural Res., 838 N.W.2d 242 (Neb. 2013) (holding the Natural Resources Districts' allegations lacked standing because they did not allege any legal right, title, or interest in the subject water of the Niobrara River and Thomas Higgins' allegations lacked standing because the harm was speculative and not distinguishable from the harm that would be caused to any other landholder within the natural resources district).

The Middle and Lower Natural Resources Districts ("NRDs") and Thomas Higgins unsuccessfully appealed to the Supreme Court of Nebraska ("Court") the Department of Natural Resources' ("DNR") dismissal of their action for lack of standing. The purpose of the action was to object to Nebraska Public Power District's ("NPPD") application to appropriate an additional 425 cubic feet per second of natural flow from the Niobrara River. The NRDs are responsible for the management of ground water within their districts. Higgins is the owner of real property in the Niobrara River Basin who holds senior water rights and pending surface water appropriations from the Niobrara River. The DNR dismissed the appellant's objections sua sponte for lack of standing. According to DNR, NRD lacked standing because it did not allege any legal right, title, or interest in the subject water of the Niobrara River and their allegation of harm was based upon mere conjecture. Higgins did not fulfill the standing requirement because no legal right existed regarding a pending application. Further, if DNR granted the pending applications, Higgins rights would be senior to NPPD and there was no evidence of credible harm.

The Court considered four issues on appeal. First, whether the director erred when he determined that NRD did not have a cognizable interest to fulfill the standing requirement. Second, whether Higgins would be adversely affected in a manner sufficient to confer standing. Third, whether DNR applied an improper standard of review. Fourth, whether DNR failed to consider the impact of the decision on the public interest.

The Court affirmed DNR's assertion that the NRDs did not have standing. The NRDs failed to allege any legal right, title, or interest and their allegations were based on mere conjecture. The NRDs argued the granting of NPPD's application would cause a portion of the Niobrara River to be fully appropriated in the future, and a threatened injury would satisfy the standing requirements. The NRDs further argued they had standing because they were responsible for the management of ground water from the Niobrara River. The Court, in a previous case, determined that standing exists when duties are placed upon the NRDs when DNR makes a fully appropriated designation. In this case, how-

ever, the DNR made no fully appropriated designation; it was merely speculation that DNR would grant the application, which might lead to a fully appropriated designation. The NRDs also tried to argue that the appropriation would preclude the use of water for irrigation and limit their tax base. The Court ruled that the harm the NRDs suffered needed to be more specific with a more direct and identified interest.

Higgins also lacked standing because he did not allege sufficient harm. Higgins argued that the grant of NPPD's application might increase his property taxes and might affect his real property value. The Court held these allegations were both speculative and not actual or imminent. Higgins further argued the grant might affect his existing appropriations and increase the cost of his pending applications. However, Higgins failed to explain how the DNR's decision would affect his water rights when his rights were both upstream and senior to NPPD's rights.

The third issue the Court addressed was whether the DNR applied the correct standard of review. The appellants argued the DNR failed to assume all the allegations were true and view them in the light most favorable to the appellants. The Court found that the DNR used the correct standard of review because the allegations did not allege an interest or an injury sufficient enough to confer standing.

Finally, the Court addressed whether the DNR should deny an application if so demanded by the public interest. The Court concluded it did not matter whether NPPD's application was in the public interest or not because the appellants did not have standing. Neither NRD nor Higgins could assert the public interest.

Because neither the NRDs nor Higgins established an interest or injury sufficient to confer standing, the Court affirmed the decision of the DNR.

Stephan, J., Concurring in Part and Dissenting in Part

Justice Stephan concurred in the determination that NRD did not have standing. Justice Stephan asserted it was merely speculative that the grant of NPPD's application would lead to a determination that the water basin was fully appropriated. Further, no single appropriation causes a fully appropriated decision and one could argue that any appropriation would cause the basin to become fully appropriated. This would allow the NRDs to challenge any surface water appropriation.

However, Higgins' claim was based on his own water rights and he had a pending application for another appropriation. Higgins allegations that the grant of NPPD's application might increase his taxes and affect the value of his property were not enough to confer standing. However, Justice Stephan determined that Higgins' allegations that the grant would adversely impact his existing appropriations or preclude or increase the cost of his pending application were enough to confer standing despite the fact that Higgins did not allege how the appropriation would adversely affect his water rights.

Connolly, J., Dissenting

Justice Connolly dissented because he believed the majority ignored evidence of imminent harm that would result from the approval of the application. The Administrative Procedure Act (APA) permits the hearing for a contested case- a proceeding where a state agency is required to determine a partie's legal

duties, rights, or procedures. Further, the APA defines an interested person as one who is or could be adversely affected in a legally cognizable way. Justice Connolly found both the NRDs and Higgins to have alleged sufficient facts to show that they would be adversely affected by DNR's approval of the NPPD application. Thus, both the NRDs and Higgins have standing.

Sarah Cassinis

NORTH DAKOTA

Reep v. State, 2013 841 N.W.2d 664 (N.D. 2013) (holding the anti-gift clause of North Dakota's constitution precludes construing a state statute as a grant of the State's equal footing mineral interests under the shore zone to private upland landowners).

Eleven named owners of land next to navigable waters in North Dakota ("upland owners") sued the State of North Dakota ("State"), seeking declaratory judgment that they, not the State, owned the minerals under the shore zone. The landowners appealed to the Supreme Court of North Dakota ("Court") from the district court's grant of summary judgment in favor of the State.

When North Dakota joined the Union in 1889, the equal footing doctrine conferred onto the State constitutional rights to the land and mineral interests under its navigable waters from high watermark to high watermark. Although this conferral included the right to allocate its property interests, the equal footing doctrine required North Dakota, by virtue of its sovereignty, to hold its shore zone interests in trust for the public. The anti-gift clause found in N.D. Const. art. X, § 18 further protected the public trust by precluding the State from gifting its mineral interests to any private entity.

At issue in this case was N.D.C.C. § 47-01-15, which provides that private landowners next to navigable waters "take to the edge of the lake or stream at low watermark."

The upland owners argued the district court's holding was contrary to the Court's decision in *State ex rel. Sprynczynatyk v. Mills*, which they construed as holding upland owners next to navigable waters have full interests in the shore zone under N.D.C.C. § 47-01-15. The upland owners further contended the State's public trust and equal footing obligations did not relate to the proprietary privileges of ownership of subsurface mineral interests under the shore zone. The upland owners further contended that the statute did not violate the anti-gift clause.

Conversely, the State argued that its rights to shore zone mineral interests extended from high watermark to high watermark under the equal footing doctrine. The State claimed N.D.C.C. § 47-01-15 was a rule for construction, clarifying the extent of a grantor's conveyance to the grantee, rather than granting public mineral interests to private entities. The State further contended that a construction of the statute as a grant of the mineral interests to private entities would violate the equal footing doctrine and the anti-gift clause of N.D. Const. art. X, § 18.

The Court first examined *Mills* to determine whether N.D.C.C. § 47-01-15 is, as the upland owners contended, an absolute grant of shore zone interests to private landowners next to navigable waters. In so doing, it reiterated the statutory interpretation in *Mills*, wherein the Court determined the word "takes" in N.D.C.C. § 47-01-15 was ambiguous statutory language for a rule of construction, and not a grant of ownership. Examining the more specific use of the word "ownership" in *Champlain v. Valentine*, coupled with the introductory clause in N.D.C.C. § 47-01-15, the Court found a legislative intent that the statute does not grant a riparian landowner absolute ownership of the shore zone. Rather, the Court agreed with the district court that N.D.C.C. § 47-01-15 is a rule of construction for determining the boundary for grants of riparian land. The Court emphasized that its construction avoided an interpretation that would grant a private party a gift in violation of the state constitution's anti-gift clause.

Having concluded that the upland owners' reliance on *Mills* was misplaced, the Court turned to the law governing the State's ownership of mineral interests under the shore zone. Examining the public trust doctrine, the Court acknowledged a newly admitted state's power to allocate its mineral interests but emphasized that power as subject to the public trust doctrine. The Court discussed some states' allocation of ownership of the shore zone to the upland owner to the ordinary low watermark, and other states' decisions to extend an upland owner's title only to the ordinary high watermark. The State in this case claimed its mineral interests extended to the ordinary high watermark under the equal footing doctrine, and that State law thereafter governed its ownership, including the anti-gift clause of N.D. Const. art. X, § 18.

The Court turned next to the adoption of the anti-gift clause in 1889 and its development through subsequent case law. It determined that unlike previous cases, this case did not raise an issue about the State engaging in an industry, enterprise, or business. The Court proceeded to examine a holding in *Arizona Ctr. For Law v. Hassell*, which determined statutory provisions substantially relinquishing Arizona's equal footing interest in navigable riverbeds violated Arizona's anti-gift clause. It also cited *Solberg v. State Treasurer*, which held a statute directing the State to release a reserved mineral interest to a prior owner violated the anti-gift clause because the statute had the effect of transferring State property as a gift.

The Court found that the precedent in *Hassell* and *Solberg* favors a determination that N.D.C.C. § 47-01-15 did not allocate the State's equal footing mineral interests in the shore zone to upland owners. The Court noted this construction was in keeping with the Court's presumption that statutes are written in compliance with state constitutions and in favor of public interests over private interests. The Court further concluded, however, that N.D.C.C. § 47-01-15 would allow an upland owner to take the State's full interest to the low watermark if the State contractually grants or conveys parts of its equal footing interests to upland owners by deed. The Court underscored that receipt of grants or conveyances from the State is subject to the restrictions of the public trust doctrine and is invalid where the deed provides otherwise.

The Court finally examined whether the upland landowners presented any factual support to show a grant of mineral interests by the State or a successor to the State, and found that they had not. It therefore concluded the district

court did not err in concluding the State owns the mineral interests under the shore zone.

Consequently, the Court affirmed summary judgment for the State. However, the Court stressed that its decision does not preclude an upland owner from taking to the low watermark if it can establish a chain of title wherein the State granted its equal footing interest to the upland owner.

Ashley Basta

UTAH

Delta Canal Co. v. Frank Vincent Fam. Ranch, LC, 321 P.3d 1027 (Utah 2013) (holding (i) partial forfeiture was available before statutory amendment specifically providing for such forfeiture became effective when forfeiture was inherent in the principle of beneficial use; and (ii) statutory exemption for time periods when water was insufficient to satisfy a water allowance did not prevent forfeiture of available but unused water).

Delta Canal Company, Melville Irrigation Company, Abraham Irrigation Company, and Central Utah Water Company (collectively, "Irrigation Companies") and Frank Vincent Family Ranch ("Vincent") were water rights holders on the Sevier River system. Vincent purchased the water right at issue from the Samuel McIntyre Investment Company (McIntyre) in 1998. McIntyre originally obtained the water right in 1936 as part of the general adjudication of the Sevier River system. A district court at the time issued the "Cox Decree," awarding McIntyre twenty-two cubic feet of water per second (c.f.s.) from March 1 through October 1 of each year and a storage component from April 16 to October 1. The Irrigation Companies filed a complaint alleging that Vincent partially forfeited and partially abandoned its water right.

The Irrigation Companies alleged that during the twenty-two year period leading up to the filing of their 2008 complaint, Vincent and McIntyre forfeited and abandoned a portion of their water right. They claimed that from 1988 to 1998 McIntyre irrigated only 830 of its 1,051.5 acres, and that Vincent cultivated less than 900 acres after 1998. Vincent countered that it did not cultivate the full acreage for several reasons: first, the Sevier River Commissioner reduced Vincent's diversion right during water shortages; next, Vincent could not use the land beneficially due to frozen and unprepared ground; and finally, no storage right was available at that time.

The district court held Utah law did not provide for partial forfeiture or partial abandonment before 2002, and an exception in Utah Code section 73-1-4(3)(f)(i) shielded Vincent from the same after 2002. The exception provided that partial forfeiture and partial abandonment provisions did not apply in times when surface water sources did not yield sufficient water to satisfy the water right, or when groundwater was unavailable due to sustained drought. The district court found that because Vincent had not received an uninterrupted flow of twenty-two c.f.s. between 2002 and the filing of the complaint, the Irrigation Companies could not claim partial forfeiture or abandonment. Accordingly, the district court granted summary judgment in favor of Vincent. The Irrigation Companies appealed to the Utah Supreme Court ("Court").

First, the Court addressed whether partial forfeiture was available in Utah before 2002. Vincent argued that such doctrine was not available and cited precedent holding that Utah statutes did not address partial forfeiture. The Court disagreed and determined that a review of the case law showed that the recognition of partial forfeiture extended as far back as 1897. In addition, the Court noted the pre-2002 Utah Code provision, which provided that a water right ceased when an appropriator abandons or stops using water for a five year period, did not specify whether "water right" should be read to include portions of an appropriator's water right. Accordingly, the Court observed that a reasonable interpretation of this provision could state that forfeiture occurs when an appropriator ceases to use either a portion or the entirety of the water right. In resolving that ambiguity, the Court examined Utah's forfeiture and beneficial use statutes under the principle that the interpretation of a statute must be in harmony with neighboring provisions. It rejected Vincent's interpretation that partial use was sufficient to maintain a water right under the forfeiture statute, as this was inconsistent with Utah's beneficial use policy of preventing water from running without its application to beneficent uses, such as those promoting conservation, recreation, and other values deemed socially desirable, for any number of years. The Court concluded that forfeiture and partial forfeiture were inherent in the concept of beneficial use, and that when read together, the forfeiture and beneficial use statutes allowed the forfeiture of a water right in part or in whole.

Next, the Court considered whether the exemption in the post-2002 Utah forfeiture statute disallowed the forfeiture of Vincent's water right. The Court rejected the district court's interpretation that the statutory exemption barred forfeiture of any amount in periods when a water right was not satisfied. It considered that such interpretation was inconsistent with beneficial use, by which validity of a water right is contingent on use. The Court reasoned that such interpretation would allow an appropriator to use a small deficit of water to protect a water right from forfeiture even if most of the water was actually available but not put to use. However, the Court maintained that the post-2002 statute was a codification of the common law physical-causes exception, which protected appropriators from forfeiture who made beneficial use of material amounts of available water.

Subsequently, the Court addressed whether Vincent had abandoned a portion of its water right. The Court disagreed with the district court's summary judgment ruling on the abandonment claim, because such ruling hinged on the same erroneous interpretation of the physical-causes exception statute. Further, the Court determined that abandonment was not a statutory claim under the forfeiture provisions. The Court reasoned that abandonment was different from forfeiture because it required definite intent to relinquish a water right and did not require a specific period of time, whereas forfeiture required that the appropriator cease to use the water for a period of five years. Accordingly, the Court reversed the grant of summary judgment on the abandonment claim and remanded for reconsideration.

Further, the Court considered the extent of Vincent's water right. The Court determined that Vincent's water right was not a continuous award. It pointed out that the Cox Decree specified only flow and allowing a constant

diversion of twenty-two c.f.s. would result in a diversion greater than 9,000 acre-feet of water, far surpassing any quantity Vincent and its predecessor had ever used. In addition, the Court pointed out that the Cox Decree did not dispute the proposed determination drawn up in preparation for the 1936 general adjudication of the Sevier River system, which indicated that Vincent's predecessor used 5,000 acre-feet of water annually. Thus, it was reasonable to infer that the volume component of Vincent's water right was 5,000 acre-feet.

Last, the Court considered various issues that could potentially arise on remand. The Court first outlined a proper forfeiture analysis. It declared that because flow awards are not continuous, a failure to divert the maximum amount allowed did not result in automatic forfeiture. It recognized that a forfeiture analysis should focus on whether the appropriator has failed to use material amounts of its volume allowance. Also, the Court maintained that the number of acres irrigated was not determinative of forfeiture. Rather, the deciding factor was whether the appropriator used all of its water allowance in a reasonable manner and for a beneficial purpose. Thereafter, the Court addressed whether the water available to Vincent and its predecessor between March 1 and April 15 should count as available water for purposes of forfeiture. It reasoned that distinguishing the pre-irrigation season would be significant only in a drought year under the physical-causes exception. Additionally, it determined that because the Cox Decree did not provide otherwise, it did not have to exclude early water from the physical exception analysis. Last, the Court noted that contrary to Vincent's claim, the watering of indigenous vegetation was generally not beneficial use and that a trier of fact should be wary of such use to prevent forfeiture.

Edgar Barraza

WASHINGTON

Swinomish Indian Tribal Cmty. v. Wash. State Dep't of Ecology, 311 P.3d 6 (Wash. 2013) (holding a Department of Ecology rule invalid because the Department of Ecology may not rely upon the water code's statutory exception for overriding considerations of public interest as broad authority to reallocate water from established minimum flow rights to reserve water for future beneficial uses).

The Skagit River system supplies water to numerous water rights holders and is the only river system in the contiguous United States that accommodates all six species of Pacific salmon. In 2001, the Washington State Department of Ecology ("Ecology") enacted the Skagit River Basin Instream Flow Rule ("Instream Flow Rule"), which established minimum instream flow requirements to protect wildlife, recreation, and aesthetic values.

In 2003, Skagit County and others filed suit against Ecology challenging the Instream Flow Rule. Skagit County argued the Rule was invalid because it did not allocate noninterruptible water for new uses and thus effectively prevented any new development that required water throughout the year. After several years, Skagit County and Ecology agreed to a settlement that resulted in Ecology promulgating an amended instream flow rule ("Amended Rule"). The

Amended Rule created twenty-seven reservations of water for particular uses that would not be subject to interruption, even when minimum instream flow requirements were unmet. Under the Amended Rule, a user could acquire a permit from Ecology to use these water reservations.

In exempting these water reservations from curtailment, Ecology relied upon the state water code's overriding-considerations exception ("OCPI Exception"), which allows for junior water withdrawals that impair minimum flows "where it is clear that overriding considerations of the public interest will be served." Ecology thus determined these reservations, which allowed for new uninterrupted withdrawals for domestic, municipal, industrial, agricultural, and stock watering purposes, would promote important public interests and the benefits would outweigh the impacts of such uses on water resources, fish populations, and recreational uses.

In 2008, the Swinomish Indian Tribal Community ("Tribe") filed a petition for review with the Superior Court of Thurston County ("trial court") challenging the validity of the Amended Rule under the Administrative Procedure Act ("APA"). The trial court upheld the Amended Rule and dismissed the Tribe's petition. The Tribe appealed to the Washington State Supreme Court ("Court").

The Court reviewed the validity of the Amended Rule in accordance with the APA. First, the Court considered Ecology's interpretation of the OCPI Exception. Creating its own balancing test, Ecology had evaluated the public interests served by the water reservations, the harm the reservations would pose to the public interest, and whether the benefits clearly outweighed the harms. Based upon projected increases in economic productivity over a twenty-year period and the need for uninterrupted water to supply new beneficial uses, Ecology concluded the benefits of the reservations clearly outweighed the "very small" potential ecological and recreational harms and, thus, constituted a valid exception.

However, the Court pointed out that the OCPI Exception is a narrow one that is not intended to be a mechanism to reallocate water. Referencing its holding in *Postema v. Pollution Control Hearings Board*, the Court reiterated that minimum flows established by rule constitute an appropriation with a priority date as of the rule's effective date. Such a minimum flow right is subject to the same protections as any other water right, meaning a subsequent water withdrawal cannot impair it unless it fits under the OCPI Exception. However, considering that the OCPI Exception itself did not receive a thorough analysis in *Postema*, the Court chose to continue that analysis here.

The Court next explored the OCPI Exception's statutory context. The Courted observed that the OCPI Exception seeks to maintain base flows and permit withdrawals that conflict with such flows only when the withdrawals would clearly serve an overriding consideration of the public interest. Under Ecology's balancing test, a beneficial use of water qualified as an exception if the collective benefit of all such beneficial uses outweighed the collective harm resulting from impaired instream flows. The Court pointed out that the OCPI Exception does not contemplate beneficial uses and, therefore, does not regard every conceivable beneficial use as serving the public interest. The Court deter-

mined that the term "beneficial uses" was not equivalent to the OCPI Exception's "public interests" language. The Court accordingly held that Ecology's test, which balanced beneficial uses against the potential of harm to instream uses, was not consistent with the statutory requirement of the OCPI Exception. Thus, the Court rejected Ecology's interpretation of the OCPI Exception.

The Court then considered the consistency of Ecology's Amended Rule with respect to the overall statutory scheme, looking at the prior appropriation doctrine and minimum flow water rights in particular. Washington adopted the prior appropriation doctrine in 1917. Accordingly, in order to issue a water permit, "Ecology must affirmatively find (i) that water is available, (ii) for a beneficial use, and that (iii) an appropriation will not impair existing rights, or (iv) be detrimental to the public welfare."

The Court observed that nothing in the OCPI Exception indicated that the state legislature intended to provide an alternate means of appropriating water if a user could not prove these four requirements. The Court noted that Ecology's Amended Rule would allow new uses to impair existing water rights. Specifically, by combining the benefits of a new use with other uses for the purpose of making a water reservation under the OCPI, the Amended Rule would allow a junior appropriator to acquire rights superior to those of earlier appropriators. Therefore, the Court determined that the Amended Rule was not consistent with the prior appropriation doctrine.

The Court then considered minimum flow water rights. The Court noted that Washington had long expressed its intent to protect fish populations. In 1969, the Washington Legislature enacted the Minimum Water Flows and Levels Act, authorizing Ecology to set minimum flows to protect fish and wildlife, to preserve recreational and aesthetic values, and to preserve water quality. Under this act, minimum flow rights were subject to the "first in time, first in right" Principle of the prior appropriation doctrine. In 1971, the legislature passed the Water Resources Act to clarify the water resource policy and goals of the state and thereby assure that waters were fully protected and used for the greatest public benefit. The Water Resources Act identified safeguards for fish and wildlife and the preservation of environmental and aesthetic values in its designation of protected beneficial uses, but also included the public interest OCPI Exception. Over time, the legislature continued to confirm its belief that minimum flow rights demanded the same treatment as any other water right. Finally, in 2001 Ecology promulgated rules establishing minimum instream flow requirements for the Skagit River Basin.

The Court found Ecology's interpretation and application of the OCPI Exception would diminish established minimum flow water rights. Additionally, the Court determined the overall statutory scheme did not support a view that potential economic profits justify impairment of established minimum flow rights. Thus, the Court concluded the Amended Rule failed to accord minimum flow rights the protection the state legislature deemed appropriate. The Court therefore held the Amended Rule was inconsistent with the overall statutory scheme.

Finally, reasoning that the OCPI Exception could not reasonably be interpreted to replace the state's many water appropriation and minimum flows statutes, the Court determined that the legislature did not extend broad authority

to Ecology under the OCPI Exception to reallocate water. The Court held that the OCPI Exception was a narrow one requiring Ecology to identify extraordinary circumstances, not merely an alternative beneficial use, before impairing established minimum flow rights. The Court determined that Ecology's Amended Rule establishing reservations of water for certain future beneficial uses was not consistent with the plain language of the OCPI Exception, the statutory context, or with the overall statutory scheme. Therefore, the Court reversed the trial court's order and held the Amended Rule was in excess of Ecology's authority and was thus invalid.

Dissenting in part, Justice Wiggins argued that in the Water Resources Act of 1971 the legislature clarified its intent to give equal treatment to minimum flows and competing water interests. Further, referencing the Court's prior determination that Ecology had the authority to interfere with an existing water right to set minimum flows, Justice Wiggins contended that, considering equal treatment of water appropriations, Ecology could similarly interfere with an existing minimum flow right under certain circumstances. Thus, Justice Wiggins concluded that a vested minimum flow appropriation did not serve to make the water right irreversible.

Next, Justice Wiggins examined the language of the OCPI Exception. Justice Wiggins disagreed with the Court's determination that Ecology could not rely on a cost-benefit analysis to decide whether a certain reservation met the requirements of the OCPI Exception. Applying Ecology's cost-benefit analysis, Justice Wiggins conceded that the majority of the Amended Rule's reservations did not constitute overriding considerations of the public interest. However, with respect to the rural public water systems and permit-exempt wells exception, Justice Wiggins argued the record provided a clear indication this particular reservation would provide substantial value to underserved users at a negligible cost to the stream system. A reservation of 1.5 cubic feet per second in this case would provide water to individuals who otherwise might be without water for up to twenty days during some months. Accordingly, Justice Wiggins argued that if such overwhelming benefits failed to justify a valid exception, it would be difficult to determine whether there ever could be a legitimate application of the OCPI Exception. Further, Wiggins argued that, due to its hydrological expertise, Ecology was in a better position than the Court to determine the impact of the proposed reservation.

Holly Taylor

WISCONSIN

Rock-Koshkonong Lake Dist. v. State Dep't of Natural Res., 833 N.W.2d 800 (Wis. 2013) (holding the Wisconsin Department of Natural Resources ("DNR") (i) lacked constitutional authority under the public trust doctrine, but possessed statutory authority, to consider the impact of proposed water levels on adjacent wetlands above the ordinary high water mark, (ii) may consider wetland water quality standards, and (iii) must consider economic impacts when setting lake levels).

Lake Koshkonong ("Lake") is the sixth largest lake in Wisconsin and is located at a natural widening of the Rock River. The Lake has a large surface area, but it is quite shallow, with a maximum depth of seven feet. It contains twenty-seven miles of shoreline, ten of which support residential and commercial lake communities. Additionally, the Lake contains 12.4 miles of wetland shoreline that is replete with diverse wildlife and vegetation. The Indianford Dam affects the water levels on the Rock River and the Lake, but due to nearly forty years of disrepair the dam had failed to regulate water levels. As a result, water levels on the Lake were higher than the target levels DNR set in 1991. Wisconsin rehabilitated the dam in 2002, resulting lower lake levels more consistent with DNR's 1991 targets.

In response to these lower water levels, in 2003 the Rock-Koshkonong Lake District, Rock River-Koshkonong Association, Inc., and Lake Koshkonong Recreational Association, Inc. (collectively, "the District") petitioned DNR to raise the target levels on the lake. The District contended that the lower levels had an adverse impact on water recreation, and that DNR's mandated winter drawdown negatively impacted shore erosion, plant life, and animal species. After conducting an environmental assessment, DNR denied the District's petition ("DNR's denial") but resolved to raise the winter drawdown minimum by half of an inch. The District then sought a contested case hearing with the Department of Administration, Division of Hearings and Appeals, which affirmed the DNR's decision to reject the District's petition based largely on DNR's showing that granting the District's petition and thereby raising the lake level would adversely impact adjacent wetlands and water quality in the Lake and the Rock River.

Next, the District petitioned for review in the Rock County Circuit Court ("Circuit Court"), raising three issues with DNR's denial. Specifically, the District argued that DNR (i) improperly interpreted the public trust doctrine to allow consideration of impacts on private, non-navigable wetlands; (ii) improperly considered water quality standards when making its water level determinations; and (iii) incorrectly excluded evidence of economic effects on property by misinterpreting the mandate in Wis. Stat. § 31.02(1) that DNR "protect . . . property" when managing water levels and flow rates on navigable waters. The Circuit Court affirmed the Decision, concluding that the evidence was sufficient and that the DNR's interpretation of the statute was reasonable.

The District then appealed to the Wisconsin Court of Appeals ("Court of Appeals"), which affirmed DNR's denial and held that the language of section 31.02(1) was unambiguous. Additionally, the Court of Appeals found that DNR's consideration of the impact of water levels on wetlands adjacent to the Lake and water quality standards under Wis. Admin. Code § NR 103 was reasonable. The District then petitioned the Wisconsin Supreme Court ("Court") for review, which the Court granted.

The Court considered the following five issues on review: (i) whether the Court should give deference to DNR's conclusions of law pertaining to its own statutory authority, (ii) whether DNR had constitutional authority under the public trust doctrine to consider the impacts of higher lake levels on adjacent wetlands above the Ordinary High Water Mark ("OHWM"), (iii) whether DNR

exceeded its statutory authority in making water level determinations under section 31.02(1) when it considered impacts on private wetlands adjacent to the Lake that are above the OHWM, (iv) whether Wis. Stat. § 281.92 expressly prohibits applying wetland water quality standards in a water level determination, and (v) whether DNR erred as a matter of law when it excluded most of the evidence of economic impacts at the contested case hearing.

Regarding the first issue, the Court held that DNR's conclusions of law were subject to de novo review because DNR made legal interpretations regarding its authority under the Wisconsin Constitution and state statutes, disregarded previous decisions of the Court, and acted inconsistently with long-standing DNR positions.

Next, the Court considered whether DNR exceeded its constitutional authority under the public trust doctrine by considering the impact of proposed higher water levels on non-navigable wetlands above the OHWM. In reviewing DNR's denial, the Court looked to Article IX, section 1 of the Wisconsin Constitution, which states that Wisconsin holds navigable waters in trust for the public. In previous decisions, the Court broadly interpreted the public trust doctrine to recognize not only commercial navigability rights, but also protection of recreational uses and preservation of scenic beauty.

However, DNR sought to extend its jurisdiction under the public trust doctrine beyond navigable waters to consideration of non-navigable waters, specifically the wetlands adjacent to the Lake that lay above the OHWM. The Court stated that DNR's jurisdiction does not extend to non-navigable waters because navigability is an essential element of the public trust doctrine. Furthermore, although prior cases extended the public trust doctrine to the protection of scenic beauty, the Court held that the Wisconsin Constitution does not give the state the authority to provide this protection by regulating non-navigable land bordering lakes and rivers. To do so, the Court warned, could expand the state's public trust authority to all private land in view of navigable waters. Thus, the Court concluded that there was no constitutional basis for extending the public trust doctrine to include non-navigable wetlands. Therefore, the Court held that DNR exceeded its authority under the public trust doctrine when it considered the impacts of higher water levels on adjacent wetlands above the OHWM.

Despite the inapplicability of the public trust doctrine to non-navigable wetlands above the OHWM, the Court held that section 31.02(1) gave DNR the authority to regulate and control the flow of water in all navigable waters "to promote safety and protect life, health and property." This includes the authority to regulate interests that navigable waters may affect, such as non-navigable property adjacent to navigable waters. Therefore, DNR had explicit statutory authority to consider the impact of the Lake's water levels on public and private wetlands adjacent to the lake. As the Court noted, Wisconsin derives this statutory authority from its state police power to protect property. The Court analyzed the legislative history and application of the statute and found no evidence that the legislature intended to exclude riparian rights from consideration of "property" in section 31.02(1).

Next, the Court turned to whether section 281.92 prohibited DNR's consideration of wetland water quality standards when setting lake levels under section 31.02(1). The Court began its analysis by reiterating the fact that, under section 31.02(1), DNR has the authority to regulate and control the flow of water in all navigable waters. The language in section 281.92 does not explicitly direct DNR to apply wetland water quality standards when making water level determinations, but the Court pointed out that the statute also does not prohibit DNR from doing so. Therefore, the Court interpreted the two statutes in harmony, upholding the Court of Appeals finding that nothing should limit the DNR when setting water levels. Furthermore, the Court found that DNR did not actually apply the Wis. Admin. Code § NR 103 wetland water quality standards. Instead, DNR merely evaluated the proposed water level increase against regulatory standards, including section NR 103. Thus, the Court concluded that DNR may consider wetland water quality standards when making water level determinations under section 31.02(1).

Finally, the Court examined whether DNR improperly excluded at the contested case hearing most of the evidence of the economic impacts of its water level determination. Because the meaning of "protect . . . property" in section 31.02(1) was ambiguous as to whether it included consideration of economic impact, the Court looked to precedent to interpret the phrase. Wisconsin's legislature has long recognized that water levels and dams played an important role in the state's economic development. The Court had also previously recognized the economic impacts of dams and the resulting water levels in its jurisprudence. Additionally, the Court noted DNR's past consideration of property interests in its shoreland zoning ordinance. The Court also emphasized that DNR considered economic impacts in an environmental assessment for the proposed water level order in 1982. While DNR did consider the direct impact of lowering the Lake's water levels on riparian properties in denying the District's petition to raise lake levels, the Court held that DNR wrongly excluded the cumulative economic effect of lower water levels on these properties. However, the Court tempered its holding and stressed that DNR only needed to consider reasonably identifiable economic impacts. Thus, DNR could still reject the District's petition for higher water levels even after considering the economic impacts of lower water levels on property.

Accordingly, the Court reversed the Court of Appeals's holding and remanded the case to the Circuit Court for further proceedings.

A three-justice dissent mainly disagreed with the Court's narrow reading of the public trust doctrine to not include the wetlands adjacent to the Lake. The dissent argued that the Court unnecessarily addressed the public trust doctrine when the case could have instead turned simply on a statutory construction of section 31.02(1). The dissent feared that, as a result, the Court significantly and unnecessarily weakened the public trust doctrine, representing a shift in state law that substantially hindered promotion of the public trust. Finally, the dissent disagreed that DNR must consider economic impacts when making water level determinations because section 31.02(1) does not require DNR to consider secondary or indirect economic impacts.

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