

# [***ARTICLE:WATERING GROWTH IN COLORADO: SWEPT ALONG BY THE CURRENT OR CHOOSING A BETTER LINE?***](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:4992-DTD0-00SW-50K8-00000-00&context=1516831)

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**Text**

**[\*412]**

[*I*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831). INTRODUCTION

In the 2003 session of the ***Colorado*** Legislature, some predicted as many as 100 water-related bills would be introduced.[[1]](#footnote-2)1 While water has always been a hot political issue in ***Colorado***, this level of legislative attention is likely unprecedented, and reflects the convergence of two forces discussed in Part II: growth and drought. Together, these two phenomena are playing havoc with urban Front Range water budgets. Urban growth increases municipal water demands while drought - and the prospect that the current drought forbears more fundamental, long-term climate change - devastates supply. The impacts of this convergence are varied, but include municipal water shortages, loss of agricultural crops and rural economies, depletion of stream flows and associated aquatic habitats, deteriorating water quality, renewed Front Range/West Slope controversy, and increased tension with neighboring states. [[2]](#footnote-3)2

It is almost too obvious to observe that the Environmental Protection Agency's veto of the proposed Two Forks dam signaled the end of major new on-stream dam building in 1990 and, some will say, an inevitable crisis. What is more important is what happened after the veto. We believe it is impossible to understand the current situation without seeing Two Forks as symbolic of a larger, systemic problem: escalating transaction costs. Discussed in Part III, these are the various costs that precede the construction and/or delivery of water to new residents, and the most important factor in municipal water decisions of the past decade. After Two Forks, Front Range providers naturally turned to the most cost effective and most likely to succeed alternatives, the conversion of existing agricultural water rights to municipal use, particularly involving trans-basin and/or already adjudicated water.

Drought, of course, further challenged a system already under stress. Municipal providers responded with their only real option, enforced conservation. And while the state may be coming out of the drought - at least in the areas most under growth pressure - the experience was serious enough that we must sincerely think about doing things differently.

The legislature responded to the challenges of the drought with enthusiasm, if not directly to the challenges of growth. New statutes **[\*413]** address interruptible supply contracts, temporary loans, incentives to repair restricted dams, and water banking, in a word: cooperation. And while the Supreme Court continues to define the outer reaches of the State Engineer's authority,[[3]](#footnote-4)3 the General Assembly nearly as quickly grants new statutory powers, bolstered with additional procedural safeguards. [[4]](#footnote-5)4 These new laws do not represent fundamental changes, but numerous improvements on the margins. And, while the new statutes do not directly address growth, cooperating in times of shortage will make it easier to meet the needs of growth without permanently reducing the water base of the rest of the state. In fact, cooperative agreements to give the cities the water they must have for their residents in dry years could not only maintain, but also bolster the state's important agricultural economy.

Cooperation is similarly at the core of a strategy that holds promise to meet growth demands, discussed in Part IV. Specifically, trans-basin cooperation can make additional supplies of new water available to meet urban Front Range growth, at least where the basin of origin has unmet needs. Conservation and efficiency, including demand management, reuse, and regional coordination are other promising strategies. Finally, conjunctive use of ground and surface water supplies can meet substantial growth needs, as well as provide drought insurance.

[*II*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T352-D6RV-H379-00000-00&context=1516831). SINKING FURTHER INTO A WATER CRISIS

In 1999-2001, the authors of this article researched and wrote a detailed review of ***Colorado*** legal and policy issues associated with growth built upon: (1) interviews with seventy key water leaders in the state; (2) a major conference the authors organized on the subject at the University of ***Colorado*** Natural Resources Law Center;[[5]](#footnote-6)5 and (3) findings of several recently completed studies on ***Colorado*** water issues. [[6]](#footnote-7)6 As evident from the title of the resultant publication, Water and Growth in ***Colorado***, the issue that most demands the attention of the **[\*414]** ***Colorado*** water community is growth.[[7]](#footnote-8)7 At the time of our research, few of our interview subjects mentioned the deepening drought, a situation that by spring of 2002 had become impossible to ignore. Together, growth and drought are the twin pillars of ***Colorado***'s current water crisis. But while the drought will likely end soon, growth likely will not.

A. Growth

***Colorado*** is the nation's third fastest growing state, behind only Nevada and Arizona, and is home to eight of the eighteen fastest growing counties nationally.[[8]](#footnote-9)8 During the 1990s, ***Colorado*** welcomed more than 400,000 immigrants from other states - the seventh highest immigration rate in the country - as well as over 65,000 new residents from other countries. [[9]](#footnote-10)9 This trend is expected to continue over the long term. State population projections suggest that the state will grow from approximately 4,327,164 in 2000 to 6,009,713, in 2020, a thirty-nine percent increase. [[10]](#footnote-11)10 Numerically, most of this growth will occur along the urban Front Range, where a thirty-six percent projected increase will boost the population from 3,512,768 in 2000 to 4,774,120 in 2020. [[11]](#footnote-12)11 One Front Range town, Superior, is already the nation's fourth fastest growing city, by percentage, from 1990 to 1999. [[12]](#footnote-13)12

The rest of the West, with few exceptions, is also in a boom period.[[13]](#footnote-14)13 Since the early 1970s, the population of the western states has grown by about thirty-two percent, compared to the national growth rate of approximately nineteen percent. [[14]](#footnote-15)14 The Interior West states are experiencing the largest amount of growth. [[15]](#footnote-16)15 Natural increases, for example, birth rates as compared to death rates, contribute to the boom. However, a main source of population growth stems from out-of-state immigration; people who once moved from the East Coast to the West Coast now settle in the states in the Interior West. [[16]](#footnote-17)16 In addition, people from the West Coast are **[\*415]** rebounding back into the Interior West. Nowhere is this more apparent than in Las Vegas, the fastest growing metro area in the nation during the 1990s.[[17]](#footnote-18)17 These trends did not escape the attention of the Western Water Policy Review Advisory Commission, which called the demographics of the past fifteen years "the most dramatic … of any region or period in the country's history," and warned that if "present trends continue, by 2020 population in the West may increase by more than 30 percent." [[18]](#footnote-19)18

One implication of the current population boom is that the West is no longer predominately rural.[[19]](#footnote-20)19 With few exceptions, new residents are locating in urban settings, giving the West a higher ratio of urban to rural residents than the East. [[20]](#footnote-21)20 These urban centers are increasingly in competition with the agricultural sector for water and land resources. The situation in ***Colorado*** is typical of the "New West." ***Colorado*** is a major agricultural state with over five billion dollars generated annually by agriculture. [[21]](#footnote-22)21 Much of this agricultural crop production and associated revenue relies on irrigation, which is the impetus behind well over ninety percent of the water diverted from streams and aquifers in ***Colorado***. [[22]](#footnote-23)22 However, agriculture takes a back seat to the "service sector" as the economic engine of the state. [[23]](#footnote-24)23 As municipal water demands increase, economic pressures encourage the retirement of irrigated lands to free up water supplies, [[24]](#footnote-25)24 because the price of water for municipal use is often many orders of magnitude greater than for agriculture. [[25]](#footnote-26)25

**[\*416]** Municipal appetite for agricultural water supplies is evident in the projections of the ***Colorado*** Water Development Study.[[26]](#footnote-27)26 For example, the report projects municipal water demands in Division 1 - the South Platte Basin home to the Denver Metro region and the northern urban Front Range - to increase from approximately 689,000 acre-feet in 2000, to 853,000 acre-feet by 2020, to 1,453,000 acre-feet by 2100. [[27]](#footnote-28)27 It is the urban Front Range, from ***Colorado*** Springs to Ft. Collins, that is the thirsty and growing 900-pound gorilla of ***Colorado*** water.

Conventional wisdom to the contrary, there is no place in the United States where the physical supply of water is a limitation on growth.[[28]](#footnote-29)28 The reality is that municipal and industrial growth decisions are rarely based on water availability. [[29]](#footnote-30)29 Douglas County, ***Colorado*** and Las Vegas, Nevada are just two examples of staggering growth in regions with questionable water supplies. [[30]](#footnote-31)30 The more salient relationship between water and municipal growth concerns the costs, and distribution of costs, associated with developing water for new residents. As a practical matter, other regions and water-reliant sectors, to the detriment of the environment and agriculture, quench increasing municipal water demands. [[31]](#footnote-32)31 For example, trans-mountain water diversions serving Front Range cities often do so at the expense of stream flows on the West Slope and foothills, and have left some mountain communities struggling to find locally available water not already claimed by distant cities. [[32]](#footnote-33)32 Other communities, such as those in the Rocky Ford area in southeastern ***Colorado***, have seen local irrigation water - and the associated agricultural economy - exported to distant municipalities. [[33]](#footnote-34)33 Other negative impacts, such as water pollution, simply flow downstream to other communities and neighboring states. [[34]](#footnote-35)34 The municipal sector, in most cases, will be the **[\*417]** last in the state to directly feel the impacts of growth on water because of its economic power in the water marketplace.[[35]](#footnote-36)35 Moreover, if frustrated enough, municipalities can afford to solve their problems via statewide initiative at the ballot box. [[36]](#footnote-37)36

B. Drought

Precipitation varies significantly within the state from about seven inches to over fifty-five inches annually, with a statewide average of approximately seventeen inches per year.[[37]](#footnote-38)37 Generally, mountain snowfall annually replenishes late-spring snowmelt storage reservoirs used to serve cities and farms in the more arid and populous regions of the state. [[38]](#footnote-39)38 While flooding is a threat in many regions, drought is the greater climatic concern to water managers and legislators in ***Colorado*** - especially at the current time. [[39]](#footnote-40)39

Although the current drought is several years old in most regions of ***Colorado***, the impact on urban Front Range water supplies did not become apparent to the public until 2002. Most municipal water systems had little problem with the relatively dry years in 2000 and 2001, as end of summer reservoir storage in the South Platte and Upper ***Colorado*** basins, the major supply sources for the Urban Front Range, remained strong, at eighty-eight and ninety-eight percent, respectively, of the long-term average.[[40]](#footnote-41)40 Winter of 2001-2002, however, was among the driest winters on record in ***Colorado***; as of May 1, 2002, snow pack in the South Platte and Upper ***Colorado*** measured only twenty-three percent and twenty-eight percent, respectively, of the long-term average. [[41]](#footnote-42)41 Recognizing the looming disaster, in April, Governor Owens sought a federal "emergency drought designation" for the entire state, [[42]](#footnote-43)42 while municipalities enacted a variety of watering **[\*418]** restrictions designed to limit summer use. Despite these efforts, end of summer reservoir storage in the South Platte and Upper ***Colorado*** basins dropped to forty-eight and forty-four percent of the long-term average.[[43]](#footnote-44)43 Thus, with the drought cushion largely gone, the winter of 2002-2003 had to be wet for ***Colorado*** to sustain normal levels of use.

Until the current drought, the state had been highly fortunate in recent decades, enjoying an unusual span of wet years without any sustained multiple year droughts. In fact, ***Colorado***'s last sustained drought occurred from 1951 to 1957, although shorter and regionally isolated drought events occurred in 1976-77, 1980-81, 1989-90, 1994, and 1996.[[44]](#footnote-45)44 Previously, the South Platte and Upper ***Colorado*** ***River*** watersheds serving the Front Range had been particularly free from drought. [[45]](#footnote-46)45 Consequently, most of ***Colorado***'s urban Front Range residents had little or no experience with drought, and most municipalities were caught without drought plans or with plans focused only on seasonal shortages rather than more extreme or longer-term events. [[46]](#footnote-47)46

The net result of an extreme drought following many years of sustained wet conditions and rapid growth has been to dramatically elevate water supply concerns on the public policy agenda.[[47]](#footnote-48)47 As often seen, the dramatic but likely short-term phenomenon of drought appears to have generated more political momentum than the more gradual but longer-term phenomenon of growth. However, it is the combined impact of both phenomena that is most attention grabbing, as illustrated by several notable events. First, the ***Colorado*** legislature seriously considered a bill proposing $ 10 billion in water development bonds for new, unspecified projects. [[48]](#footnote-49)48 Another example is the re-emergence of long-tabled water project proposals. The most ambitious of these efforts is the so-called "Big Straw" project that would annually pump at least 400,000 acre-feet of ***Colorado*** ***River*** water from the ***Colorado***-Utah border for urban Front Range use. [[49]](#footnote-50)49 **[\*419]** Other proposals call for revisiting the proposed Two Forks dam project on the South Platte ***River***, a project vetoed by the United States Environmental Protection Agency in 1990.[[50]](#footnote-51)50 As Marc Waage of Denver Board of Water Commissioners ("Denver Water") recently remarked, "I've heard more about Two Forks this summer than in the past ten years." [[51]](#footnote-52)51 Still another idea making a comeback is vegetation management - for example, increasing timber harvests with an eye toward increasing water runoff. [[52]](#footnote-53)52 The ***Colorado*** Department of Natural Resources supported a bill addressing vegetation management on state land and the legislature enacted it into law in 2003. [[53]](#footnote-54)53

While the present drought provides an important wake-up call for cities and residents unaccustomed to the harsh realities of climatic variability, it is nonetheless a temporary event. In fact, there is considerable research suggesting that the past couple of wet decades may be a more likely precursor of future wetter climatic regimes than suggested by both the previous longer-term record and, certainly, the current drought.[[54]](#footnote-55)54 The long-term water management challenge is best described as accounting for the uncertainty of climate variability and/or climate change in management regimes that address the more predictable, and ongoing, demographic transformations in the state - namely, population growth, urbanization, land-use conversions, and related sector shifts in how water is used and valued. [[55]](#footnote-56)55 While there is no way to "solve" the current drought, the public climate offers a huge opportunity to do something to prepare for the next one. [[56]](#footnote-57)56

**[\*420]**

[*III*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T372-8T6X-731R-00000-00&context=1516831). SWEPT ALONG BY TRANSACTION COSTS

Municipalities generally use one of two major strategies to meet the water demands of new growth. Historically, cities simply developed new water as needed to meet growing needs.[[57]](#footnote-58)57 More recently, municipalities have acquired existing, usually agricultural, water rights and changed them to urban use. [[58]](#footnote-59)58 Transaction costs are significant in either approach.

There is substantial time and uncertainty associated with changing a water right in water court, adjudicating a trans-basin diversion, or permitting a new water project to develop existing water rights. To understand the municipal Front Range providers' water supply decisions of the past decade, it is useful to conceptualize the various pre-delivery/pre-construction costs as different facets of transaction costs. Transaction costs play a key role in shaping the behavior of ***Colorado***'s water providers.[[59]](#footnote-60)59 In fact, transaction costs are the most important factor in municipal water decisions of the past decade.

A. Water Court

Many of the most significant transaction costs are associated with water court. In ***Colorado***, the determination of water rights is a "judicial function under the adjudication statutes."[[60]](#footnote-61)60 Not only must an appropriator go to water court to adjudicate her water right or change it, she must also go to water court to protect it, and in the case of a conditional right, to maintain it. [[61]](#footnote-62)61 It makes no difference if the right is for 1 or 100 cubic feet per second or 100,000 acre-feet; the process is identical. [[62]](#footnote-63)62 Water court is not simple, fast, painless, or cheap. A routine unopposed change of water right and augmentation plan for a domestic well can take over a year, with engineering and legal costs exceeding the value of the water involved by more than an order of magnitude. [[63]](#footnote-64)63 Complex cases can stretch over years, and attract dozens of opponents. For example, litigation over Union Park extended from 1984 through 2000, and included over twenty parties. [[64]](#footnote-65)64 Appeals are common, and go directly to the ***Colorado*** Supreme Court. [[65]](#footnote-66)65

**[\*421]** The lack of clearly defined information, a necessary prerequisite for an efficient market, contributes to high transaction costs.[[66]](#footnote-67)66 For example, water right decrees typically specify a diversion rate, whereas the measure of a water right is its consumptive use. [[67]](#footnote-68)67 Although engineers can estimate the yield of a water right, adjudication is necessary to determine consumptive use. Thus, purchasers of existing rights for new municipal uses may not know in advance the actual yield of the rights they are purchasing for transfer. The junior protection rule [[68]](#footnote-69)68 guarantees in many, perhaps most, situations that not all of a water right can be transferred, and it is not apparent at the time of filing a change case which junior appropriators will be injured and what will be necessary to keep them whole, even with extensive engineering. The unknown level of risk and time required to traverse water court appears in the purchase price; water that has gone through a previous change case usually carries a higher value than water that has never had its consumptive use adjudicated. [[69]](#footnote-70)69

Efficient markets minimize transaction costs.[[70]](#footnote-71)70 ***Colorado*** water markets are most active where the property rights - the yield - are well defined and where conveyance facilities exist to easily move water to higher value uses. The premier ***Colorado*** example - on both points - is the ***Colorado***-Big Thompson Project ("C-BT"). [[71]](#footnote-72)71

1. The Influence of Water Court on Municipal Water Decisions

There is substantial evidence that water court transaction costs significantly influence the decisions of municipal water managers. A significant long-term trend is the purchase and conversion of so-called "foreign" water from agricultural uses to municipal uses.[[72]](#footnote-73)72 For example, municipalities such as ***Colorado*** Springs, Pueblo, Pueblo **[\*422]** West, and Aurora now own almost all of the water from the Twin Lakes project located south of Leadville, a trans-basin project originally designed to serve irrigation interests.[[73]](#footnote-74)73 Shares sell for $ 10,000 to $ 15,000, a price dramatically higher than the cost of native Arkansas ***River*** water. [[74]](#footnote-75)74 Yet, buying shares of trans-basin water for municipal use makes better economic sense than buying native water since it is generally possible to unilaterally change the use without the uncertainty or risk of water court. [[75]](#footnote-76)75

C-BT shares exhibit a similar trend. Municipal water providers concerned about water court costs to convert native water dramatically bid up the price of C-BT units.[[76]](#footnote-77)76 Weighted C-BT prices rose steadily from around $ 3,600 per acre-foot in June 1996 to nearly $ 26,000 per acre-foot in April 2000. [[77]](#footnote-78)77 In contrast, competing native irrigation water sells for $ 500 to $ 1,000 per acre-foot, depending on location. [[78]](#footnote-79)78 The percent of C-BT water in municipal and industrial hands has increased from fifteen percent in 1956, to fifty-nine percent in 2002. [[79]](#footnote-80)79 C-BT water is preferred since it is readily available, and the right to use the water for municipal purposes has already been adjudicated. In addition, C-BT water is backed by storage, substantially insuring dry-year yield.

The minimal transaction costs of acquiring existing trans-basin diversions for municipal use are a sharp contrast to the extreme costs associated with newly proposed trans-basin diversions. For example, the American Water Development, Inc. ("AWDI") proposal to export water from the San Luis Valley to the Denver Metro area consumed nine years and several million dollars in attorneys' fees and engineering fees associated with expert testimony presented in court.[[80]](#footnote-81)80 The ***Colorado*** Supreme Court ended AWDI's plans when it upheld the District Court's dismissal of AWDI's water rights application. [[81]](#footnote-82)81

Maintaining and eventually exercising conditional trans-basin water rights also incurs extremely high transaction costs. These costs have made it enormously expensive to implement large-scale projects **[\*423]** in phases, as each step in the process provides a new opportunity for opponents to impose delays and new conditions, as the Homestake project demonstrates.[[82]](#footnote-83)82 For conditional rights, a trip to water court is required every six years to prove due diligence. [[83]](#footnote-84)83 Each change to a proposed project may require new court proceedings, as the impact on juniors must be reconsidered. [[84]](#footnote-85)84 Theoretically, some of these repetitive costs could be avoidable through trans-basin decrees that outline general terms and conditions. However, vague language in these decrees or unforeseen circumstances virtually guarantees further litigation. The Blue ***River*** decree, for example, requires Denver Water to "exercise due diligence" to reuse water imported from the ***Colorado*** ***River*** to meet Denver's municipal needs, "within legal limitations and subject to economic feasibility." [[85]](#footnote-86)85 This requirement obviously means different things to Denver Water and to the West Slope. [[86]](#footnote-87)86

Agricultural-to-urban water transfers often involve changes in the type of use, the place of use, the point of diversion, and the season of use, as well as the care of formerly irrigated land, all of which are issues that require a trip to water court.[[87]](#footnote-88)87 An agricultural-to-municipal transfer can potentially affect every downstream user on the stream. The larger and/or the more senior the water right and the more significant the change, the more likelihood there is of injury, with a corresponding incentive for other appropriators to oppose the change. Ironically, because of resulting high transaction costs, developers of formerly irrigated agricultural lands often import foreign water for municipal use rather than changing the use of irrigation water associated with the land's agricultural use. [[88]](#footnote-89)88 Most developers are unwilling or unable to defer their development and incur the carrying costs necessary to complete a water court change case to supplement municipal needs; it is cheaper for them to acquire an existing supply already adjudicated for domestic use, such as Twin Lakes water. [[89]](#footnote-90)89 However, when open space in the subdivision needs **[\*424]** irrigation water, the associated water rights can supply it without court approval since there is no change in place or type of use.[[90]](#footnote-91)90

B. The Politics of Trans-Basin Diversions

The intrastate politics of trans-basin diversions create another source of costly delays in obtaining water. Urban growth along ***Colorado***'s Front Range historically prompted large water diversions from the West Slope. Many factors suggest that the Front Range will continue to look across the mountains for additional water through trans-basin diversions. These factors include existing under-utilized trans-basin water rights and facilities,[[91]](#footnote-92)91 the current availability of unused water on the West Slope, [[92]](#footnote-93)92 political opposition to conversion of eastern plains agricultural-to-urban water, [[93]](#footnote-94)93 Denver basin groundwater mining, [[94]](#footnote-95)94 and potentially, water quality [[95]](#footnote-96)95 and endangered species [[96]](#footnote-97)96 problems along the Front Range. An additional benefit of imported water to the Front Range is its legal status. Foreign water can generally be used to extinction, and changes in use are often possible without costly court proceedings. [[97]](#footnote-98)97

Trans-basin diversions have often been a battlefield between the populous Front Range and the rest of ***Colorado***, largely due to real and potential negative impacts borne by the basins of origin.[[98]](#footnote-99)98 The most obvious basin of origin impacts of trans-basin diversions are associated with reduced stream flows. [[99]](#footnote-100)99 Since any return flows occur in the basin of use rather than the basin of origin, exported water is a complete loss to the basin of origin. [[100]](#footnote-101)100 Depending on the use of water rights involved, depletions may be either year-round or seasonal. [[101]](#footnote-102)101 The result is a variety of impacts: economic, environmental, and cultural. [[102]](#footnote-103)102

Some policies seek to mitigate these negative impacts to the basin of origin.[[103]](#footnote-104)103 Historically, "compensatory storage" has been the centerpiece of mitigation strategies. [[104]](#footnote-105)104 This term describes a practice in which East Slope interests, in "compensation" for trans-basin diversions, develop water projects designed to store spring runoff for **[\*425]** use on the West Slope, typically for irrigation.[[105]](#footnote-106)105 This principle was incorporated into C-BT in 1937, [[106]](#footnote-107)106 and became a statutory requirement in 1943 for all new projects undertaken by conservancy districts. [[107]](#footnote-108)107 The requirement does not extend to other trans-basin diverters, notably Denver Water, or to intra-basin transfers," [[108]](#footnote-109)108 such as within the Arkansas basin. "This is a significant limitation." [[109]](#footnote-110)109

Other protections for the basin of origin are present in water law regimes and operational policies that minimize depletions during the irrigation season.[[110]](#footnote-111)110 "Trans-basin rights are typically junior during the irrigation season but are relatively senior at other times." [[111]](#footnote-112)111 For junior water rights, depletions may only occur in average or wet years when it is possible to divert water in priority and/or store it during spring run-off for later trans-basin delivery. [[112]](#footnote-113)112 Although the West Slope often blames trans-basin diversions for low flows, trans-basin appropriators usually are not diverting when stream flows are the lowest. [[113]](#footnote-114)113 Rather, it is West Slope ski areas and resort communities that are diverting water during winter low flows. [[114]](#footnote-115)114

Trans-basin diversions remain highly controversial and unpopular outside the urban Front Range.[[115]](#footnote-116)115 Part of the reason that modern targets of trans-basin diversions view proposals with such hostility is the **[\*426]** legacy of bitterness and distrust arising from past trans-basin diversions that remind many Western Coloradoans of California"s Owens Valley.[[116]](#footnote-117)116 Given the growing imbalance in political and economic power, West Slope interests increasingly see themselves as being at a strategic disadvantage in these intrastate water wars. [[117]](#footnote-118)117 Rather than participating in conceiving and designing trans-basin diversions, parties in the basin-of-origin have typically fought projects in water court, the primary forum in ***Colorado*** for the determination of water rights, including the determination of the amount and priority of absolute and conditional rights, approval of changes in water rights, and plans for augmentation. [[118]](#footnote-119)118 Recent examples include Homestake II, AWDI, and Union Park. [[119]](#footnote-120)119 Periodic legislative attempts to require consent to trans-basin diversions have faced insurmountable political odds in the state legislature. [[120]](#footnote-121)120 However, there is increasing recognition that mitigation of basin of origin impacts is an essential prerequisite for additional water development to meet the state's growth. [[121]](#footnote-122)121

1. Leveling the Water Table

In recent decades, opponents of trans-basin diversions have become remarkably adept at delaying new projects, sometimes effectively killing them. Since Windy Gap came on line in 1985, no other significant trans-basin diversions have come to fruition, despite the efforts of water appropriators holding senior water rights.[[122]](#footnote-123)122 The primary venue to thwart additional diversions is water court.

Arapahoe County has been the principal proponent of the Union Park Project to divert water from the Gunnison basin for municipal use on the East Slope.[[123]](#footnote-124)123 This project proposed to capture surplus water high in the Gunnison basin for ultimate diversion under the Continental Divide to the South Platte basin. [[124]](#footnote-125)124 Stalled by Gunnison **[\*427]** basin interests since 1986, the ***Colorado*** Supreme Court recently rejected the water right for the second time.[[125]](#footnote-126)125 Because of this litigation, Union Park is infinitely farther from reality than it was sixteen years ago, although the general concept still has powerful proponents.

Over time, several organizations have pursued large-scale development of groundwater in the San Luis Valley for export. American Water Development, Inc. led the most infamous of these efforts, which proposed to tap and export 200,000 acre-feet of groundwater underlying land held by AWDI.[[126]](#footnote-127)126 A storm of political opposition and litigation derailed this proposal and lead to a court judgment rejecting AWDI's claim that the water involved was actually non-tributary, and thus, not governed by normal rules of appropriation and transfer. [[127]](#footnote-128)127

Recently, former AWDI opponent and San Luis entrepreneur Gary Boyce, backed by California investors, pursued an only slightly less ambitious plan to export 100,000 acre-feet to Front Range cities.[[128]](#footnote-129)128 The conversion of the Great Sand Dunes National Monument into a National Park may end these proposals. [[129]](#footnote-130)129 The Nature Conservancy's purchase of the Baca Ranch - the source of recent trans-basin diversion proposals - seemingly settles the controversy. Part of the ranch will join the new park, and the remainder will join the Rio Grande National Forest and Baca National Wildlife Refuge. [[130]](#footnote-131)130 This expansion will protect the park's watershed, and effectively limit withdrawal of the valley's groundwater for trans-basin diversions.  [[131]](#footnote-132)131

While it may be an overstatement to conclude that there are no foreseeable new trans-basin diversions of any significance that can overcome basin of origin opposition, both the Union Park and San Luis Valley export projects illustrate the truism that water projects seldom die. Reincarnations and reincarnators abound; there are few wooden stakes.[[132]](#footnote-133)132

**[\*428]**

2. Union Park Redux?

Officials from El Paso County, ***Colorado*** Springs, Douglas County, Arapahoe County, Aurora, Adams County, Northglenn, Elbert County, and Lafayette recently joined to form the ***Colorado*** Water Partnership ("Partnership").[[133]](#footnote-134)133 Members represent growing urban areas along the Front Range that generally need additional water supplies to meet the demands of increasing population. In the 2000 Legislative Session, the Partnership sponsored an unsuccessful bill to require the ***Colorado*** Water Conservation Board ("CWCB") to solicit proposals and recommend development of a new water supply project to deliver a minimum of 120,000 acre-feet annually from the West Slope to the East Slope. [[134]](#footnote-135)134 Since many proponents of Union Park supported the legislation, some concluded that the bill was a veiled attempt to promote that project. [[135]](#footnote-136)135 A Partnership-promoted letter to Secretary of Interior Norton reinforced this perception by asking the Bureau of Reclamation "to look at opportunities to use … for the benefit of the entire state" the 240,000 acre-feet in the marketable pool of the Aspinall Unit noted in the ***Colorado*** Supreme Court's opinion which rejected the Union Park proposal. [[136]](#footnote-137)136

[*First*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831) introduced in the 2002 Special Session, the group again sponsored legislation to authorize $ 10 billion in debt for new water storage projects and to tap unused water from the ***Colorado*** ***River*** basin in 2003.[[137]](#footnote-138)137 The important point is that these efforts reflect an unwillingness to accept the status quo, and an attempt to forge a new path to realize trans-basin diversion projects. As such, this legislation exemplifies the increasing frustration of some local elected officials with ***Colorado***'s system of water courts and permitting, and a willingness to override settled processes in an effort to secure additional water supplies to meet the demands of water users on the Front Range. [[138]](#footnote-139)138

C. Environmental Permitting

One of the greatest sources of delay, frustration, and expense for water providers is environmental law. These requirements are typically **[\*429]** federal in origin. The federal government owns approximately one-third of the land in ***Colorado***.[[139]](#footnote-140)139 Similar to other federal landholdings in the West, many of these acres are in the high mountains that collect ***Colorado***'s winter snows, the state's major source of precipitation. [[140]](#footnote-141)140 All of ***Colorado***'s great ***rivers*** arise on federal land, and flow through federal land as they journey out of state. Thus, it is not surprising that federal laws influence many facets of ***Colorado*** water law and policy. These include the Wilderness Act of 1964, [[141]](#footnote-142)141 the National Environmental Policy Act of 1969, [[142]](#footnote-143)142 the Clean Water Act of 1972 [[143]](#footnote-144)143 and of particular importance, the Endangered Species Act of 1973. [[144]](#footnote-145)144

1. Two Forks

In the 1940s, Denver Water started planning to meet the water demands of the anticipated population growth that will occur in the twenty-first century. The initial plan entailed building a dam and reservoir that would supply adequate water to the Denver-metropolitan area through the year 2020.[[145]](#footnote-146)145 Two Forks Reservoir was to be a major water storage project located below the confluence of the South Platte ***River*** and its North Fork. The project "was designed to deliver 98,000 acre-feet of water per year on a firm yield (sometimes called drought yield) basis to the Denver metropolitan area to meet future residential, commercial, and industrial demands." [[146]](#footnote-147)146 While Two Forks promised to provide sufficient water for anticipated population increases, the price of the project was considerable, and the potential environmental costs were, ultimately, prohibitive.

The public greatly opposed the project. However, the inability to secure a federal environmental permit finally killed the project.[[147]](#footnote-148)147 The 1986 draft Environmental Impact Statement ("EIS") prepared by the U.S. Army Corps of Engineers ("Corps") foreshadowed the scope of negative environmental impacts, as did the final EIS released in March of 1988. [[148]](#footnote-149)148 Despite these circumstances, the Corps decided to issue the necessary Section 404 permit required under the Clean Water Act [[149]](#footnote-150)149 **[\*430]** for dredge-and-fill activities in ***rivers***. The Corps justified the permit issuance with the potential to mitigate the negative impacts.[[150]](#footnote-151)150 The U.S. Environmental Protection Agency ("EPA"), which had long been critical of the proposed project, did not share the Corps' confidence. The EPA has the statutory authority to veto 404 permits; [[151]](#footnote-152)151 a power the agency exercised over Two Forks on November 23, 1990. The EPA veto of Two Forks not only halted an undertaking backed by an impressive political coalition of municipal water providers and $ 40 million in preliminary studies, but signaled a new era in serving Front Range growth.

2. The Endangered Species Act

In recent years, endangered species issues have increased in importance, from being a deciding factor between alternative uses or projects, to being a central consideration in almost all uses and all projects.[[152]](#footnote-153)152 Endangered species issues are ubiquitous, touching every ***river*** basin, as well as reaching upstream and downstream from critical stream segments. The purpose of the Endangered Species Act ("ESA") is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species." [[153]](#footnote-154)153 Sections 7 and 9 are the heart of the Act, described by one observer as "the pit bull of environmental policy." [[154]](#footnote-155)154 Section 9 prohibits the "taking" of a federally listed species. [[155]](#footnote-156)155 ""Take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." [[156]](#footnote-157)156 Habitat destruction may also be considered a taking. [[157]](#footnote-158)157 This prohibition finds expression in Section 7 of the Act, which requires federal agencies "in consultation with the … Secretary [of Interior to] utilize their authorities in furtherance of the purposes of [the ESA] … for the conservation of endangered species and threatened species." [[158]](#footnote-159)158

Implementation of the ESA raises a host of jurisdictional issues, between federal and state government, and between federal and private interests. Of particular concern to the western states is the judicial finding that federal agencies can withhold permits and approvals necessary for the exercise of water rights pursuant to state law if necessary to prevent a "take" of a federally listed endangered **[\*431]** species. The Tenth Circuit Court of Appeals directly addressed this issue in Riverside Irrigation District v. Andrews,[[159]](#footnote-160)159 involving the U.S. Army Corps of Engineers, the Riverside Irrigation District, and endangered whooping cranes threatened by the proposed Wildcat Reservoir in northern ***Colorado***. [[160]](#footnote-161)160

While one might suspect that, but for the ESA, ***Colorado*** would have developed much more water in the past twenty-five years, there is little evidence this is the case.[[161]](#footnote-162)161 Other factors, such as the Clean Water Act and state-delegated county 1041 permitting authority, are much more significant. [[162]](#footnote-163)162 In fact, the ESA's most visible impact in ***Colorado*** appears to be the formation of multi-party programs to recover and delist species. [[163]](#footnote-164)163 This is not to say, however, that the ESA has not affected water development decisions - it has. [[164]](#footnote-165)164 Reduced yields from "re-operation" of existing water projects to meet ESA-driven goals are another real impact. [[165]](#footnote-166)165

One can again find in the active C-BT market another example of the effect of transaction costs. The purchase of C-BT shares of water is **[\*432]** a private transaction; endangered species issues are the responsibility of the C-BT contracting agency, the Northern District, and not the buyer, a substantial advantage for the purchaser.

3. County 1041 Land Use Authority

Federal laws are not the only environmental permitting hurdles that water projects face in ***Colorado***. Pursuant to 1041 Regulations,[[166]](#footnote-167)166 and the Local Government Land Use Control Enabling Act, [[167]](#footnote-168)167 Grand and Eagle Counties adopted regulations entitled Guidelines and Regulations for Areas and Activities of State Interest. [[168]](#footnote-169)168 ***Colorado*** courts have upheld county regulatory authority over water development based on these statutes. [[169]](#footnote-170)169

In 1967, ***Colorado*** Springs and Aurora developed the Homestake Project to supply their municipal needs with West Slope water from the ***Colorado*** ***River***.[[170]](#footnote-171)170 The first phase of the project went on line with the Homestake Reservoir on the West Slope. [[171]](#footnote-172)171 Water collected in the reservoir eventually flows into the Arkansas ***River*** basin on the East Slope through a trans-Continental Divide tunnel. [[172]](#footnote-173)172 After flowing down the Arkansas ***River***, some of this water is diverted and pumped via the Otero Pump Station across South Park to the South Platte ***River*** basin, where Aurora stores the water in Spinney Mountain Reservoir until needed. [[173]](#footnote-174)173 The rest remains in the Arkansas basin, and is routed to ***Colorado*** Springs through a different pipeline. [[174]](#footnote-175)174

***Colorado*** Springs and Aurora planned a second phase of the Homestake Project, a major trans-basin diversion.[[175]](#footnote-176)175 Eagle County rejected the cities' permit application for additional diversion and storage facilities near Vail in the early 1990s. [[176]](#footnote-177)176 The court of appeals upheld Eagle County's denial of a local 1041 permit for Homestake II. [[177]](#footnote-178)177

Following the EPA's veto of Two Forks, Homestake II emphasized the essential importance of environmental permitting. For example, since the failure of Homestake II, Aurora has abandoned all of its large trans-basin projects in favor of smaller, presumably more certain **[\*433]** projects.[[178]](#footnote-179)178 Few now doubt that a core value of the New West is a desire to protect and restore environmental resources. [[179]](#footnote-180)179

[*IV*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T3H2-D6RV-H37G-00000-00&context=1516831). CHOOSING A BETTER LINE

While transaction costs gained preeminent influence in the past decade, they lack any intrinsic characteristic that dictates the state's water future. ***Colorado*** can choose to address the challenges of drought and growth through a variety of strategies. These alternatives serve broader socioeconomic goals than answers driven solely by transaction costs, and may offer more attractive solutions if the state considers all costs.

A. Three-Pronged Strategy

The principal urban supply options continue to lie in three traditional categories: (1) water reallocation, (2) conservation and efficiency, and (3) new development. The best mix of these strategies to meet ***Colorado***'s needs is admittedly subject to opinion, but it is apparent that a better future rests on a pragmatic mix of all these options.[[180]](#footnote-181)180 Focusing on one strategy is unrealistic; focusing on just one project or reform is even more tenuous. The paths ***Colorado***'s decision-makers choose to serve their customers will also shape the state's future agricultural economy and the Western Slope. [[181]](#footnote-182)181 Without statesmanship on both sides of the Continental Divide to bury the unilateral, parochial, and competitive past and to seek new solutions that also address basin-of-origin and environmental concerns, Front Range growth will divert water from irrigated agriculture, forever changing the historic character and economy of the state. [[182]](#footnote-183)182

B. Reallocation

One of the easiest and most effective strategies for augmenting municipal water supplies is the reallocation, or transfer, of water from one user to another. While these transfers take on several forms, in the vast majority of examples transfer activities move water from the agricultural to the municipal sector.[[183]](#footnote-184)183 Several factors encourage these water transfers. Most important is the rapid growth of municipal water demands at a time when traditional regional economies based on **[\*434]** agriculture, livestock, and mining are flat or declining.[[184]](#footnote-185)184 These traditional western enterprises use most of the water - over 90 percent of consumption in the western states - and control the most senior water rights. [[185]](#footnote-186)185 It is frequently argued that a reallocation of just ten percent of agricultural water to municipal uses could augment municipal supplies by fifty percent. [[186]](#footnote-187)186 Other factors encouraging water transfers include the higher economic, political and environmental costs of other options, especially new dam and reservoir projects. [[187]](#footnote-188)187

Under ***Colorado*** law, a holder of a decreed water right can sell, lease, exchange, or change it. The designated use can change, as well as the place of use, but only up to the amount of historic use.[[188]](#footnote-189)188 Water transfers can take several forms, be permanent or temporary, and be based upon various types of contingency arrangements. This variety of tools brings great flexibility to the transfer option, further stimulating water reallocations. Transfers of foreign water offer a distinct advantage; as such, transfers often do not injure other rights holders and thus avoid the necessity of water court proceedings. [[189]](#footnote-190)189

Despite legal, political, and economic costs associated with water transfers and, specifically, the need to have changes of use approved in water court, reallocation of water is still usually more cost-effective than other water supply augmentation options.[[190]](#footnote-191)190 For the next decade at least, reallocation of water from agricultural to municipal use will be a core element of strategies to accommodate municipal growth - perhaps the core element.

Transfers can cause negative economic, social, and environmental impacts for the area losing water.[[191]](#footnote-192)191 These impacts are normally borne by "third parties," a term used to describe any potentially affected interest to a water transfer other than the buyer or the seller. [[192]](#footnote-193)192 Perhaps more than basins-of-origin affected by trans-basin diversions, agricultural communities suffer socioeconomic losses when municipalities purchase and transfer agricultural water to meet urban needs. [[193]](#footnote-194)193 The classic examples are communities whose economies depend on agricultural activity, including services to farmers and ranchers. [[194]](#footnote-195)194 While an irrigator receives a sizable check from selling her water rights, and perhaps retires far away with the proceeds, the **[\*435]** community's economic base contracts permanently.[[195]](#footnote-196)195 Some believe that protecting these interests is an essential responsibility of policy-makers, and there have been periodic legislative proposals to regulate such transfers. For example, in 2003, Representative Salazar sponsored a bill to require water judges to impose terms and conditions on water transfers that address the direct economic effects of a trans-basin water diversion on the basin of origin. [[196]](#footnote-197)196 When a similar bill passed the Senate in 2002, it died amid claims that it would lower the value of water rights to the sellers. [[197]](#footnote-198)197 This illustrates the schizophrenic attitudes towards trans-basin diversions in basins of origin, which explains in part why such legislation does not pass.

Temporary transfers are a theoretically promising alternative to permanent reallocation. Often, municipalities have adequate water rights for average to wet years - even with growth - but lack reliable supplies in dry years or for periods of extended drought, as 2002 demonstrated. This results from the fact that municipal water rights are often relatively junior and subject to call in dry years.[[198]](#footnote-199)198 Thus, a mechanism to assure an adequate supply for dry years is sometimes all a municipality needs. [[199]](#footnote-200)199 In other cases, a municipality may simply need an interim water source to act as a bridge until a permanent supply comes on line. Several alternatives to the outright purchase of additional water rights allow municipalities to meet their temporary water needs, although none is in widespread use in ***Colorado***.

1. Leases

A water lease is an agreement between a rights holder and a new user providing for a temporary water transfer of a pre-determined quantity and duration. Parties leasing water are often those with excess supplies, at least in the short term, in need of a beneficial place to "park" them. Lessees may be parties needing interim supplies while seeking a permanent source of water, or may be responding to a drought crisis.[[200]](#footnote-201)200 For example, Aurora leases 5000 acre-feet per year **[\*436]** from Pueblo for a term of fifteen years, with a ten-year option.[[201]](#footnote-202)201 Other communities, such as Commerce City, have declined lease offers from Pueblo, due to a strong bias for permanent supplies. [[202]](#footnote-203)202 This reluctance is evidence of a general municipal apprehension about less than full control over their water supplies. The enormous potential for future problems of supplying permanent development with temporary water supplies is the basis for this fear. [[203]](#footnote-204)203 The drought has changed this attitude. Aurora reportedly drafted legislation to facilitate leasing other's senior rights to cities. [[204]](#footnote-205)204

2. Subordination Agreements

A subordination agreement is one way for a municipality to increase the reliability of its water supply.[[205]](#footnote-206)205 It enters into a contract with senior rights holders where the senior pledges not to call out the junior municipality. [[206]](#footnote-207)206 The U.S. Bureau of Reclamation recently freed 60,000 acre-feet of water for new uses in the Upper Gunnison ***River*** basin when it signed an agreement covering the Aspinall Unit, demonstrating the significance of subordination agreements. [[207]](#footnote-208)207

In probably the ultimate subordination in ***Colorado***, Denver Water and Xcel Energy[[208]](#footnote-209)208 entered into an agreement for the Shoshone Power Plant, a senior water right that controls the mainstem of the ***Colorado*** ***River*** during the winter. [[209]](#footnote-210)209 The agreement allows Denver Water to divert ***Colorado*** ***River*** water out-of-priority upstream of the Shoshone Power Plant when the plant has placed a call on the ***river***, primarily during the winter months. [[210]](#footnote-211)210 In return, Denver Water agreed to **[\*437]** reimburse the costs of replacing lost power generation.[[211]](#footnote-212)211 Conceived as a replacement for Two Forks, [[212]](#footnote-213)212 the 2002 drought actually provided the impetus for an arrangement between Denver Water and the ***Colorado*** ***River*** District to implement the agreement for 2003. [[213]](#footnote-214)213 The recent deal reduces the Shoshone call, allowing Denver to refill its drought-depleted reservoirs, [[214]](#footnote-215)214 while the West Slope receives ten percent of the water made available by the reduction of the call. [[215]](#footnote-216)215 Denver will pay Xcel for power interference costs. [[216]](#footnote-217)216 Although the Supreme Court recently recognized selective subordination, [[217]](#footnote-218)217 the current agreement simply reduces the call, benefiting all junior rights.

3. Dry-Year Options

An additional strategy for increasing the reliability of a municipal water supply is a dry-year option agreement, also known as an interruptible supply contract. A dry-year option allows temporary water transfers during specified hydrologic conditions.[[218]](#footnote-219)218 As the name implies, dry-year options normally "allow the senior rights holders to continue to use the water (in most cases for farming) in normal years and give the option holder (often a municipal user) a cost-effective way to make its supply more reliable during dry years." [[219]](#footnote-220)219 In exchange for the option arrangement, the municipality pays a fee to the irrigator for entering into the agreement, plus additional amounts for exercising the option and actually transferring the water. [[220]](#footnote-221)220

Dry-year options theoretically provide a win-win situation for both the agricultural and municipal sectors. They allow farmers to retain ownership of water rights, to augment their income through fees collected when entering into the agreement, and to receive compensation for production losses experienced when a municipality exercises its option in dry years.[[221]](#footnote-222)221 For the municipality, a dry-year option provides a means of drought protection which could be much more cost-effective than the purchase of new water rights, and perhaps more importantly, the construction or expansion of storage facilities, [[222]](#footnote-223)222 although storage may still be required to implement a successful dry- **[\*438]** year leasing program. There is substantial anecdotal evidence that irrigators hold unrealistic expectations of the value of their rights, and are unwilling to give up control of their water in a dry year.

Dry-year options are not common in ***Colorado***, but well established in California.[[223]](#footnote-224)223 Legal complications and uncertainties partly explain the limited use of dry-year options in ***Colorado*** up to the present. Most issues stemmed from the fact that exercising the option entailed a "change of water right," which required judicial approval to permit use for additional purposes, for example municipal use, to divert at a different point, and to apply water at a different place than originally decreed. [[224]](#footnote-225)224 The legislature eliminated many of these obstacles in 2003, granting the State Engineer authority to approve temporary changes in the point of diversion, location of use, and type of use during and immediately following a declared drought emergency. [[225]](#footnote-226)225

To the extent that legal requirements prove to be expensive and time-consuming, they discourage dry-year options and similar temporary measures and encourage permanent transfers.[[226]](#footnote-227)226 Transaction costs also are likely to discourage dry-year options that involve relatively small quantities of water, or that involve multiple rights holders. Additionally, agricultural interests may resist dry-year options that they perceive as impeding the outright future sale of their water rights to another provider who needs an annual supply. To succeed, an agreement must adequately address the interests of both parties. The municipality needs assurance that the water will be available when needed; the owner needs compensation for losses caused by the exercise of the option, plus some incentive to enter into the agreement. [[227]](#footnote-228)227 It will also probably be necessary to create a schedule of compensation based on the date the municipality exercises its option. [[228]](#footnote-229)228 For example, if the option is exercised before planting, the farmer will have avoided some costs and compensation should correspond accordingly. [[229]](#footnote-230)229 However, if exercised later, the farmer will have unrecoverable costs that require greater compensation. [[230]](#footnote-231)230 There may also be concerns about calculating the value of lost productivity, and possible third-party effects such as greater difficulty among other ditch users in delivering their water.

**[\*439]**

4. Lease-Back Arrangements

Leaseback arrangements are the mirror image of dry-year option agreements. In a leaseback arrangement, the municipality acquires ownership of the water right, makes the appropriate changes in water court, and then leases the rights back to the seller.[[231]](#footnote-232)231 There are two principal variations of this scenario.

The first is most analogous to a dry-year option agreement and occurs when a provider only needs the water rights in case of drought.[[232]](#footnote-233)232 In average or wet years, the municipality meets its needs with other water rights and leases the water back to the original seller. [[233]](#footnote-234)233 This leaseback approach allows for the possibility of retaining long-term agricultural use. [[234]](#footnote-235)234 Examples abound in the Northern District where municipalities have purchased some water rights solely for use during drought. [[235]](#footnote-236)235 In average or wet years, they rent the water back to farmers through annual agreements. [[236]](#footnote-237)236 This essentially is a form of water banking nested within the context of a leaseback arrangement. [[237]](#footnote-238)237

The second situation may be more typical in ***Colorado***. Here, a municipality acquires the agricultural water rights it needs to meet future growth.[[238]](#footnote-239)238 It then leases the water back to the seller for continued agricultural use until the growth materializes. [[239]](#footnote-240)239 Pueblo, for example, annually leases excess water to irrigators. [[240]](#footnote-241)240 In 1999, the city leased 13,000 acre-feet for three to seven dollars per acre-foot. [[241]](#footnote-242)241 These leasebacks defer the impacts of agricultural transfers until municipal growth creates the need for water.

The potential for leaseback arrangements is high, given the efforts of municipal water providers to drought-proof their water systems. Many municipalities plan to meet a thirty-to fifty-year drought without cutbacks, while trying to stay twenty to fifty years ahead of projected population demands.[[242]](#footnote-243)242 This means that in average or wet years, most municipalities have excess supplies they can make available to **[\*440]** agricultural or other uses. Unfortunately, some agricultural lands do not respond well to periodic cycles or irrigation and fallow. For example, it is impossible to return the lands irrigated by the Rocky Ford Ditch that were purchased by Aurora to productivity within a single irrigation season following several years of being dry.[[243]](#footnote-244)243

5. Water Banking

Water banks are analogous to water markets, with the exception that water banks seek to coordinate temporary, rather than permanent, water transfers. "A water bank is a formal mechanism for pooling surplus water rights for rental to other water users."[[244]](#footnote-245)244 The ***Colorado*** Legislature enacted a pilot water-banking program for the Arkansas ***River*** basin in 2001. [[245]](#footnote-246)245 The purpose of the legislation is to test the concept of a water bank to "simplify and improve the approval of water leases, loans, and exchanges, including interruptible supply agreements, … [and to] reduce the costs [of] such transactions." [[246]](#footnote-247)246 The statute requires the State Engineer to report on the effectiveness of the pilot program by November 1, 2005. [[247]](#footnote-248)247 It is too early to tell how well the bank will function, but there is not much activity. [[248]](#footnote-249)248 This may be due to unrealistic expectations of profits by Arkansas Valley irrigators. The South Platte and Rio Grande basins need water banking as well, [[249]](#footnote-250)249 and the General Assembly enacted legislation requiring the state engineer to promulgate the necessary rules to establish water banks upon the request of a water conservancy district. [[250]](#footnote-251)250

The Northern ***Colorado*** Water Conservancy District's water allocation system has both a marketing and banking component, as transfers can be either permanent or temporary.[[251]](#footnote-252)251 Temporary exchanges, such as annual rentals, are a highly flexible means for water providers to adjust to annual fluctuations in demand.

C. Conservation and Efficiency

Municipal providers can stretch existing water supplies to serve growing populations through a variety of management strategies. While water conservation practices cannot satisfy future water supply needs alone,[[252]](#footnote-253)252 they are an important part of the solution.

**[\*441]** The current drought demonstrates the potential for demand management among Front Range cities. The authors' investigation of nine Front Range municipalities suggests that mandatory (drought-inspired) water restrictions in the summer of 2002 generally reduced water consumption by more than fifteen percent when compared to water use in the 2000-2001 period, a time of slightly smaller populations and significantly wetter weather.[[253]](#footnote-254)253 In only July and August of 2002, Denver Water saved over 10,000 acre-feet, mainly by restricting lawn watering to every third day [[254]](#footnote-255)254 - a practice that is already permanent in some cities, such as Castle Rock. [[255]](#footnote-256)255 The potential for additional savings may be limited, however. There is some evidence that demand has "hardened" over the past couple of decades from a general emphasis on conservation. [[256]](#footnote-257)256 Denver Water, for example, only realized eighteen percent annual savings from drought restrictions in 2002, substantially less than expected. [[257]](#footnote-258)257 Before the enactment of restrictions, water consumption in many Front Range cities was on a record high pace, a potentially devastating trend given already depleted storage reservoirs. [[258]](#footnote-259)258 Given that water demands normally soar in hot, dry times, the effectiveness of mandatory restrictions, focused mainly on limiting lawn watering, is more impressive.

1. Demand Management

The number of ***Colorado*** municipal water providers not pursuing some sort of water conservation likely fell to zero in 2002. The success of municipal water restrictions in the summer of 2002 may indicate opportunities for further, permanent reductions in per capita water use.[[259]](#footnote-260)259 The feasibility of sustaining or deepening reductions is open to debate, but the statistics on water use suggest that there is still considerable room for improvement. Per capita water use in the United States is three times that of the average European country, and astronomically more than most developing nations. [[260]](#footnote-261)260 According to the United States Geological Survey, per capita water use in the United **[\*442]** States, as of 1995, for "public supply"[[261]](#footnote-262)261 purposes averages 179 gallons per day nationally. ***Colorado***'s rate of 208 gallons per day is fifteen percent above the national average. [[262]](#footnote-263)262 Approximately sixty-three percent of water used within Denver is for landscaping. [[263]](#footnote-264)263 This high use of water for landscaping is not surprising, given Coloradoans' love for lush lawns in apparent denial of the state's semi-arid climate.

Denver Water estimated that conservation could save twenty-seven percent, approximately 72,000 acre-feet, of current system use, particularly through the adoption of xeriscaping programs.[[264]](#footnote-265)264 Reducing water consumption associated with lawn-watering is a difficult challenge given the prevalence and cultural acceptance of lush lawns, and given rules such as the Highlands Ranch covenant that not only requires a minimum size lawn, but also requires it be kept green. The homeowner's association may fine a homeowner for allowing their grass to "brown up" during summer months. [[265]](#footnote-266)265 Not surprisingly, legislation adopted in 2003 prohibits such covenants in the future. [[266]](#footnote-267)266

2. Pricing Mechanisms

Economists describe the degree to which demand for a good or service is responsive to price changes using the term "elasticity."[[267]](#footnote-268)267 Elasticity can be reduced by several factors, including the degree to which the good or service is essential, and cannot be replaced with substitute products, and the overall price of the good. [[268]](#footnote-269)268 In part due to the low cost of water, a recent study of water conservation in the West suggests that price is only a modestly effective tool for managing demand:

Water price has a significant and negative impact on water use, but water demand is very price inelastic, more so than has been suggested in most other studies. The highest elasticity estimate was for summer use (approximately -0.20). At this degree of consumer responsiveness, water utilities could double their water rates and expect, at a maximum, only a 20 percent decrease in water use during the peak season. More likely, utilities should expect a water elasticity of -0.10 on an annual basis; a hefty 50 percent increase in rates will reduce use by 5 percent.[[269]](#footnote-270)269

**[\*443]** Raising residential water rates to encourage conservation is politically difficult. Since water service is a basic human need, equity and public health considerations provide a compelling rationale for making water available at the lowest possible cost.

3. Wastewater Reuse

Municipalities across the West are increasingly looking to wastewater as a water supply source.[[270]](#footnote-271)270 Solving two problems at once is part of the appeal of water "recycling" because "it reduces the need to develop new sources to meet growing demands and it helps reduce the level of effluent discharges into surface water and groundwater." [[271]](#footnote-272)271 Reuse also often provides a highly competitive and cost-effective means of supply augmentation. [[272]](#footnote-273)272

The most common examples of direct reuse are for non-potable purposes, which pose considerably smaller public relations challenge than potable reuse. Non-potable reuse is also cheaper since it does not require treating water to drinking water standards, and it is well suited for agricultural, industrial, and municipal landscape irrigation purposes.[[273]](#footnote-274)273 For example, ***Colorado*** Springs supplies approximately 2,500 acre-feet per year of non-potable water from a wastewater treatment plant and Monument Creek to irrigate golf courses, cemeteries, city and county properties, and sports facilities. [[274]](#footnote-275)274 ***Colorado*** Springs' system is expected to grow in proportion to the city's overall water demand, expanding to serve the irrigation needs of Woodmen Valley and the Broadmoor Hotel at a cost of between $ 500 and $ 850 per acre-foot. [[275]](#footnote-276)275

Non-potable reuse requires construction of distribution systems isolated from potable water systems. This is an important cost consideration, and militates for the use of reclaimed water in places with concentrated non-potable demands.

Another potential problem involves increased consumptive use, which reduces downstream flows that could injure junior water rights. Thus, reuse may only be feasible with foreign water, and even then may raise endangered species issues downstream, at least on the South Platte.

Direct potable reuse is an intriguing, albeit controversial, idea. One form of potable reuse occurs from the presence of municipal wastewater in the raw water taken into a municipal water system. This **[\*444]** can occur by piping effluent directly into a drinking water system where it is treated and distributed - a rare but technically feasible activity.[[276]](#footnote-277)276 This can also occur by mixing treated wastewater into a municipality's raw water supply. Because of geography and gravity, this latter situation is ubiquitous, occurring anywhere a wastewater discharge is upstream of a drinking water diversion point. For example, Thornton's drinking water contains treated effluent from the upstream Bi-cities Wastewater Plant. There are several other examples of ***Colorado*** cities' drinking water supplies composed of five to forty-five percent effluent. [[277]](#footnote-278)277

4. Reuse in Denver

The 1955 Blue ***River*** decree[[278]](#footnote-279)278 suggests that Denver has a legal obligation to reuse its trans-mountain diversions in order to minimize the need for, and size of, such diversions. [[279]](#footnote-280)279 The amount of reuse required is not specified; rather, the decree calls only for due diligence in reusing trans-basin water and for reuse to be pursued within legal and economic limits. How the city is to meet its obligation is quite ambiguous, and has not been litigated - yet. [[280]](#footnote-281)280 The Western Slope continues to pressure Denver to increase reuse as part of any plan that involves additional trans-basin diversions. [[281]](#footnote-282)281

Denver Water presently lacks a water reuse plant, although it reuses water by exchange.[[282]](#footnote-283)282 However, the agency described, in its Integrated Resource Plan, three cost-effective effluent reuse opportunities. [[283]](#footnote-284)283 The first opportunity, a two-phase non-potable program, may yield 17,000 acre-feet per year for public and private use. [[284]](#footnote-285)284 Phase I of the Denver Water Recycling Program is currently **[\*445]** underway for completion in late 2003 or early 2004.[[285]](#footnote-286)285 Up to 8,300 acre-feet per year will supply the Park Hill Golf Course, Xcel Energy's Cherokee Power Station, city parks, and other potential industrial customers at a capital cost of almost $ 64 million. [[286]](#footnote-287)286 Phase II, 8,700 acre-feet, will serve Stapleton and Lowry Redevelopment areas, Gateway area, and Denver International Airport after 2008 at a capital cost of $ 75 million. [[287]](#footnote-288)287

The total potential yield from two potable reuse opportunities could ultimately exceed 35,000 acre-feet per year, if potable reuse proves economically and publicly acceptable.[[288]](#footnote-289)288 Coupled with the non-potable program, Denver Water could reuse over 50,000 acre-feet per year at city build out. [[289]](#footnote-290)289 Thus, reuse could provide a substantial portion of Denver Water's total annual use of 265,000 acre-feet. [[290]](#footnote-291)290

5. Re-operation of Storage Facilities

"Re-operating" reservoirs, in a manner that allows for greater water storage, provides one strategy for increasing yields from existing systems. The Southeast ***Colorado*** Water Conservation District's ("SECWCD") winter water program presents an early example of creative reservoir management to increase the basin-wide yield of water.[[291]](#footnote-292)291 Envisioned as an integral part of the Fryingpan-Arkansas ("Fry-Ark") Project, the program allows users to temporarily store water in reservoirs during the winter months and to call for the stored water at times when the user needs the water. [[292]](#footnote-293)292

Recently, the Bureau of Reclamation and the City of ***Colorado*** Springs explored the potential of further re-operations of the Fry-Ark Project to suit municipal needs.[[293]](#footnote-294)293 This research suggested that the project had an unused storage capacity of at least 70,000 acre-feet that could, through reservoir re-operations, store non-project water. [[294]](#footnote-295)294 In 2000, the SECWCD decided, in principle, to allow municipal providers to store as much as 49,000 acre-feet of water they own in unused Fry-Ark space. [[295]](#footnote-296)295 Such re-operation could meet ***Colorado*** Springs' need for 45,000 acre-feet of additional storage capacity. [[296]](#footnote-297)296 However, the proposal requires the consent of the Bureau, which once concluded that federal law [[297]](#footnote-298)297 prohibits the storage of non-project municipal water **[\*446]** in project facilities.[[298]](#footnote-299)298 However, the Bureau is reviewing its authority, and recently concluded that it could issue a long-term contract to the City of Aurora for the use of Frying Pan-Arkansas Project Facilities. [[299]](#footnote-300)299

Coordinated reservoir operations also emerged as a useful tool for environmental purposes. On the ***Colorado*** ***River***, 63,000 acre-feet of water from coordinated reservoir operations supported flows in the fifteen-mile reach for four endangered fish species in 1999.[[300]](#footnote-301)300

6. Regional Coordination

Integrated operations of otherwise separate water systems are another strategy for increasing yields and efficiency. The Southern Water Supply Project provides a good example in which the Project conveys trans-basin water to a dozen entities within the Northern District.[[301]](#footnote-302)301 The pipeline was first discussed to provide an alternate water supply for Broomfield in 1991, the same year a regional study forecast increased water demands in Boulder and Weld counties. [[302]](#footnote-303)302 Working together, the project addressed Broomfield's needs and allowed other entities to meet their needs at a cost that was far less than if each had acted independently. [[303]](#footnote-304)303

The Metropolitan Water Supply Investigation ("MWSI") identified coordination among urban Front Range water providers as one of the Front Range's most promising future water management options.[[304]](#footnote-305)304 Unfortunately, competition, suspicion, and controversy among the largest water providers characterize ***Colorado*** water history. Additionally, many past efforts at cooperative water development failed spectacularly, as evidenced by Two Forks, Homestake II, and Union Park. This legacy leaves many water providers leery of big cooperative projects. [[305]](#footnote-306)305

Any meaningful progress regarding coordinated system operations requires the cooperation of a few key players. In the Denver Metro area, Denver Water must necessarily be at the center of any significant cooperative arrangements, simply because it maintains the region's most extensive infrastructure.[[306]](#footnote-307)306 Denver Water has adopted a policy **[\*447]** that invites cooperative proposals from other entities.[[307]](#footnote-308)307 Likely partners would include Aurora, Arapahoe County, Douglas County, and Thornton.

An early coordination success involves Denver Water and the City of Boulder. The two municipalities recently completed negotiations that will allow Boulder to use storage space in Denver Water's Gross Reservoir when Denver does not need the space for its municipal demands.[[308]](#footnote-309)308

The MWSI process has stimulated other conversations regarding improved system coordination and operations. Already, two promising progeny resulted from MWSI - the Southern Cooperative Action Proposal and the Northwest Cooperative Investigation.[[309]](#footnote-310)309 These initiatives are promising, largely because they are voluntary undertakings that involve the principal players on all sides of the issues, although it is too early to tell if they will yield any real improvements in water efficiency in the Denver Metro area.

D. New Development

Before Two Forks and Homestake II, the development of new water supplies was the traditional response to growth. However, construction of major new on-stream dam and reservoir projects is essentially impossible in the modern era due to environmental and area-of-origin considerations.[[310]](#footnote-311)310 In addition, areas of the state with remaining developable water are increasingly distant, and thus, economically costly and challenging to Front Range demands. Despite these challenges, some new water development is still occurring and providers currently contemplate much more in ***Colorado***. Currently viable alternatives to big dams and trans-mountain diversions tend to involve an expanded use of small and unconventional reservoirs, such as gravel pits, and Front Range projects that provide water benefits to the basins-of-origin. [[311]](#footnote-312)311 With few exceptions, waters from the Upper ***Colorado***, Gunnison, and South Platte systems are the targets of **[\*448]** additional development; other basins in the state are already at or near their development capacity, or too remote to be economically attractive.[[312]](#footnote-313)312

For a trans-basin project to succeed today, it must feature a degree of Front Range/Western Slope cooperation lacking in historic diversions because legal tools now exist to block new projects.[[313]](#footnote-314)313 The Western Slope is increasingly demanding that trans-basin projects contain inherent incentives to minimize diversions, such as pumping, [[314]](#footnote-315)314 while addressing unmet Western Slope needs for additional water. [[315]](#footnote-316)315 These needs include additional water supplies for the Fraser and Snake ***Rivers***, Ten Mile Creek, and more recreational water held in Dillon Reservoir. [[316]](#footnote-317)316 The Upper ***Colorado*** ***River*** Study ("UPCO Study") is an effort by the Northwest ***Colorado*** Council of Governments' Water Quality & Quantity Committee to quantify the Western Slope's needs. [[317]](#footnote-318)317 A draft report is due for release in 2003. [[318]](#footnote-319)318 Legislation to mitigate basin-of-origin impacts would facilitate future trans-basin diversions. [[319]](#footnote-320)319

1. Cooperative Precedents

Post Two Forks, a number of Front Range providers participated in new joint use trans-basin projects that develop new water supplies for both the Front Range and source watersheds. In this manner, urban Front Range providers can develop their trans-basin water rights to meet growth needs, and West Slope interests realize additional supplies to meet the needs of growing headwater resort communities and ski areas.[[320]](#footnote-321)320

Perhaps the best example of Front Range-West Slope cooperation is Wolford Mountain Reservoir, which solved a problem facing Denver Water and allowed the ***Colorado*** ***River*** Water Conservation District ("***River*** District") to complete a storage project to serve West Slope needs.[[321]](#footnote-322)321 Before the demise of Two Forks, Denver entered into a twenty-five-year lease for water from a reservoir the ***River*** District planned to construct on Muddy Creek, with the leased water to tide Denver over until Two Forks came on-line. [[322]](#footnote-323)322 However, with EPA"s veto of Two Forks, that premise went out the window. Concurrently, the **[\*449]** ***River*** District realized it could not build the reservoir it wanted with the $ 10 million compensatory storage payment made by the Municipal Subdistrict for the Windy Gap Project and Denver's lease fees.[[323]](#footnote-324)323 In a lengthy telephone call, Chips Barry, Manager of Denver Water, and Rollie Fischer, then Secretary-Engineer of the ***River*** District, struck a deal. [[324]](#footnote-325)324 Denver Water agreed to help finance the reservoir. [[325]](#footnote-326)325 In exchange, the ***River*** District agreed to give Denver an ownership interest rather than a leasehold interest in the yield of the reservoir. [[326]](#footnote-327)326 After further negotiations and adding some details involving supplies for the Upper Fraser ***River*** basin, Denver obtained forty percent of the reservoir's yield, and the ***River*** District was able to construct Wolford Mountain Reservoir. [[327]](#footnote-328)327 While not strictly a trans-basin diversion project - the water is used by exchange - many consider Wolford to be a model for future trans-basin diversions. [[328]](#footnote-329)328

The Clinton Gulch Reservoir Project on Fremont Pass provides another example of intrastate cooperation.[[329]](#footnote-330)329 The Clinton Gulch deal lets Denver Water obtain permanent storage capacity in Wolford Reservoir. [[330]](#footnote-331)330 The project provides headwaters communities with a little needed water, [[331]](#footnote-332)331 and buys the region more time to deal with larger trans-basin diversion issues. [[332]](#footnote-333)332 Most interesting, the project uses an ingenious exchange that allows ski areas to use out-of-priority diversions for snowmaking. By agreement, the ski areas - Keystone, Breckenridge, and Copper Mountain - take water from nearby streams that would otherwise flow into Denver Water's Dillon Reservoir, and use it for snowmaking. [[333]](#footnote-334)333 In the spring, the snow melts and flows to the reservoir, as it would have six months earlier. [[334]](#footnote-335)334 The agreement assumes twenty percent evaporation losses from snowmaking, and the ski areas repay Denver from the water stored in Clinton Gulch Reservoir. [[335]](#footnote-336)335 Thus, snowmaking is serving the same purpose as a traditional reservoir.

**[\*450]**

2. Conjunctive Use

Groundwater is particularly useful for serving low-density residential development, a type of growth that has been on the rise.[[336]](#footnote-337)336 Nowhere is this more evident than in Douglas County, which has little in the way of surface water supplies but features over a dozen groundwater-dependent municipal water supply systems and thousands of individual domestic wells that draw upon Denver Basin aquifers, a vast but fundamentally non-renewable resource. [[337]](#footnote-338)337 The long-term reliability of this water supply is a growing concern as demands escalate.

One option for utilizing the resource more efficiently may entail the conjunctive use of groundwater with surface water. A conceptual study done as part of the MWSI found that up to 60,000 acre-feet of surface water supply could be developed through a regional conjunctive use project,[[338]](#footnote-339)338 although this figure did not reflect constraints water rights and environmental concerns might impose. [[339]](#footnote-340)339 The concept called for using excess surface water to recharge East Slope aquifers, or offset pumping, in wet years. [[340]](#footnote-341)340

Denver Water, the Douglas County Water Authority ("Water Authority"), and the ***Colorado*** ***River*** Water Conservation District have ***co***-sponsored the South Metro Water Supply Study to determine the feasibility of such a regional conjunctive use project.[[341]](#footnote-342)341 A draft report is due in 2003. [[342]](#footnote-343)342 It will likely propose new appropriations of South Platte and Blue ***River*** water in wet years. [[343]](#footnote-344)343 This water would meet some of the Water Authority's needs and provide water to recharge the aquifers in wet and average years. [[344]](#footnote-345)344 In dry years, the Authority and Denver Water would draw on the aquifers to meet their demands. [[345]](#footnote-346)345

Return flows from pumped groundwater and from new trans-basin appropriations would be reusable to extinction, and the project would feature additional water reuse and conservation components.[[346]](#footnote-347)346 In this manner, the long-term aquifer depletions would be reduced, perhaps prolonging the aquifer life indefinitely. [[347]](#footnote-348)347 The project would use existing Denver Water facilities to store, deliver, and treat surface **[\*451]** water to the South Metro area for distribution through existing and new pipelines.[[348]](#footnote-349)348 Even at complete Denver Water build out, not expected before 2050, the project would yield over 25,000 acre-feet of new surface water which, when coupled with continued groundwater pumping, additional water conservation, and water reuse, could represent a sustainable water supply for Douglas County and a drought year supply for Denver and the West Slope. [[349]](#footnote-350)349 Like other trans-basin projects, West Slope support will depend on simultaneously addressing West Slope needs and concerns. [[350]](#footnote-351)350

3. Statewide Water Supply Initiative

In November 2002, the CWCB embarked on a project to identify feasible water projects and "get going."[[351]](#footnote-352)351 The Statewide Water Supply Initiative proposes to "build a consensus among all parties … as to which [water development] alternatives and strategies should be pursued for implementation." [[352]](#footnote-353)352 In short, the CWCB is proposing an innovative two-year statewide process to develop water projects that "can be built immediately." [[353]](#footnote-354)353 The project proposes to break recent impasses over trans-basin diversions and the environment through an extensive public information and involvement process. [[354]](#footnote-355)354 To be successful, the study team will have to overcome not only decades of competition, mistrust, and unilateral action by the principle water providers of the Front Range and the West Slope, but their equal suspicion of any substantive state decision-making role in water development. [[355]](#footnote-356)355 Precedents like Wolford Mountain and Clinton Gulch offer reasons for optimism.

4. ***Colorado*** 64

Club 20 sparked an effort, the so-called ***Colorado*** 64 principles, to develop consensus on some basic precepts for future ***Colorado*** water development.[[356]](#footnote-357)356 The theme is that thirsty municipalities should use and reuse existing and local sources before seeking to import water from other basins. [[357]](#footnote-358)357 Fifty-eight of ***Colorado***'s sixty-four counties **[\*452]** united in the appeal,[[358]](#footnote-359)358 and Metro Denver counties joined the endeavor in January. [[359]](#footnote-360)359 The ***Colorado*** General Assembly immediately endorsed the principles to begin "earnest efforts to find water supply answers that benefit all Coloradoans, for this and future generations." [[360]](#footnote-361)360 The principles represent a common sense approach that is difficult to disagree with, and perhaps offer further support for a new working relationship between the urban Front Range and the rest of the state.

[*V*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T3X2-8T6X-731X-00000-00&context=1516831). CONCLUSION

The next decades figure to be highly challenging for ***Colorado*** water interests as Front Range municipal water providers continue to aggressively explore a highly varied and complex set of strategies for acquiring and managing additional water supplies. The pace of legal and technological innovation is accelerating, yet in some cases - namely the South Denver Metro region - may only be sufficient to keep pace with demand due to the cushion provided by groundwater reserves. The challenge faced by headwater communities is, arguably, even greater than that faced by Front Range cities in some cases. Rapidly growing Summit and Grand Counties, for example, have a physical abundance of water, but most is unavailable for local use due to senior or conditional rights held by urban Front Range providers. The challenge for agricultural advocates, meanwhile, primarily entails trying to retain water for irrigation in the face of more economically attractive uses. Statewide, agricultural-to-urban water transfers have not had a huge impact on agriculture yet, but in some locations, such as the lower Arkansas Valley, serious economic disruption is already evident. More widespread are environmental impacts associated with past water developments. Environmental advocates will undoubtedly be challenged to win remedies for historic effects of water diversions.

***Colorado***'s deepening water crisis is not simply a matter of population increases and drought, but is also about changes in lifestyles, land-uses, politics, economics, and values. Ultimately, it is about raised expectations - especially where our water systems are concerned. For water managers to satisfy the increasingly diverse demands that confront them, innovation must continue. Managing water in a period of sustained growth and climatic uncertainty will likely require finding mechanisms for exploiting advances in engineering and management, recognizing the true economics of water development and use, adapting historic laws and policies that may unnecessarily limit progress, and perhaps reconsidering how we, as Coloradoans, value and use our limited water resources. Fortunately, recent years have produced several innovative management strategies to build upon.

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2. 2See generally Peter D. Nichols et al., Water and Growth in ***Colorado*** (2001) (discussing the legal and policy challenges facing ***Colorado***'s water managers during a period of unprecedented growth). [↑](#footnote-ref-3)
3. 3[*Simpson v. Bijou Irrigation* ***Co****., 69 P.3d 50 (****Colo.*** *2003);*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:48GW-CRR0-0039-44HJ-00000-00&context=1516831) [*Empire Lodge Homeowners Ass'n v. Moyer, 39 P.3d 1139 (****Colo.*** *2002).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:44PW-3160-0039-4363-00000-00&context=1516831) [↑](#footnote-ref-4)
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9. 9Sandra Fish, ***Colorado*** is Fifth-Fastest-Growing State, Daily Camera, Dec. 29, 1999, at [*1*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831)A. [↑](#footnote-ref-10)
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11. 11Id.at Front Range Population Projections. [↑](#footnote-ref-12)
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17. 17Perry et al., supra note 13, at 6. [↑](#footnote-ref-18)
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19. 19D. Craig Bell, Water in the West Today: A States' Perspective 3 (1997) (report to the Western Water Policy Review Advisory Comm'n). [↑](#footnote-ref-20)
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29. 29"Economic research in the 1960s showed that, for better or worse, water has rarely been a major factor in municipal and industrial land use decisions (e.g., compared with access to transportation, employment, or markets) and current land use trends and policy continue this tradition." William Riebsame et al., Western Land use Trends and Policy: Implications for Water Resources 37 (1997) (report to Western Water Policy Review Advisory Committee). The City of Pueblo had an economic development project to attract new industries to the area using the city's plentiful water supply as the carrot, but could find few interested parties. Interview with Roger L. "Bud" O'Hara, Water Res. Div. Manager, City of Pueblo Bd. of Water Works, in Pueblo, ***Colo.*** (June 30, 1999). [↑](#footnote-ref-30)
30. 30In the 1990s, Douglas County was the nation's fastest growing county, while Las Vegas was the fastest growing large city. Perry et al., supra note 13, at 5, 6. [↑](#footnote-ref-31)
31. 31Nichols et al., supra note 2, at ix. [↑](#footnote-ref-32)
32. 32Many of the best examples are from Summit County, where ***Colorado*** ***River*** headwaters are subject to trans-mountain diversions, leaving limited water available locally. Id.at 94; Interviews with Glenn E. Porzak, Esq., in Boulder, ***Colo.*** (Aug. 30, 1999 & June 22, 2001). [↑](#footnote-ref-33)
33. 33Lawrence J. MacDonnell, From Reclamation to Sustainability: Water, Agriculture, and the Environment in the American West 53 (1999). [↑](#footnote-ref-34)
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35. 35Interview with James R. Sullivan, Douglas County Comm'r, in Castle Rock, ***Colo.*** (Nov. 4, 1999). [↑](#footnote-ref-36)
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39. 39See Cathy Proctor, Battle Over Water Rights Gains Momentum, Denver Bus. J., Jan. 3, 2003, at A3. [↑](#footnote-ref-40)
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41. 41Figures compiled by the Natural Res. Conservation Serv., Basin Wide Snowpack May 2002, at ftp://ftp.wcc.nrcs.usda.gov/data/snow/basin reports/***colorado***/wy2002/basnco5.txt (last visited Jan. 10, 2003). [↑](#footnote-ref-42)
42. 42Letter from Bill Owens, Governor, State of ***Colorado***, to Ann Veneman, Sec'y, U.S. Dept. of Agriculture (Apr. 22, 2002), [*http://cwcb.state.****co****.us/owc/Drought*](http://cwcb.state.co.us/owc/drought) Planning/Disaster Designation Request.pdf. [↑](#footnote-ref-43)
43. 43[***Colo.*** *Emergency Mgmt., supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-2FY0-003D-93GY-00000-00&context=1516831) note 40, at ftp://ftp.wcc.nrcs.usda.gov/data/water/basin reports/***colorado***/wy2002/bareco8.txt. [↑](#footnote-ref-44)
44. 44***Colo.*** Water Conservation Bd., ***Colorado*** Water Census and Assessment: Scope of Work 2 (2001). [↑](#footnote-ref-45)
45. 45Thomas B. McKee et al., Historical dry and wet Periods in ***Colorado***, Climatology Report No. 99-1A, at 19-20 (1999). [↑](#footnote-ref-46)
46. 46***Colo.*** Water Conservation Bd., supra note 37, at 6. [↑](#footnote-ref-47)
47. 47See Jerd Smith, Owens Urges Calm in State Water Debate, Rocky Mountain News, Dec. 20, 2002, [*http://www.rockymountainnews.com/drmn/state/article/0*](http://www.rockymountainnews.com/drmn/state/article/0),1299,DRMN 21 1622196,00.html. [↑](#footnote-ref-48)
48. 48House Bill 1022, sponsored by Rep. Dianne Hoppe, initially called for $ 5 billion, but was later doubled at the urging of several legislators in the House of Representatives, which gave preliminary approval to the measure in July 2002. See Jerd Smith, Water Wave Builds, Rocky Mountain News, July 10, 2002, [*http://rockymountainnews.com/drmn/legislature/article/0*](http://rockymountainnews.com/drmn/legislature/article/0),1299,DRMN 37 1256794,00.html. [↑](#footnote-ref-49)
49. 49Deborah Frazier, Mega Water Plan, Rocky Mountain News, July 25, 2002, [*http://rockymountainnews.com/drmn/state/article/0*](http://rockymountainnews.com/drmn/state/article/0),1299,DRMN 21 1285878,00.html. [↑](#footnote-ref-50)
50. 50Daniel F. Luecke, Two Forks: The Rise and Fall of a Dam, [*14 Nat. Resources & Env't 24, 24-28 (1999).*](https://advance.lexis.com/api/document?collection=legalnews&id=urn:contentItem:3YMV-6RW0-00DB-50V5-00000-00&context=1516831) [↑](#footnote-ref-51)
51. 51Marc Waage, Denver Bd. of Water Comm'rs, Remarks at the Thirteenth Annual South Platte Forum (Oct. 23, 2002). [↑](#footnote-ref-52)
52. 52Theo Stein, A Clear-Cut Drought Solution? Logging Urged to Boost Run-off, but Eco-Groups Object, The Denver Post, Nov. 10, 2002. See also Charles A. Troendle & James M. Nankeris, Estimating Additional Water Yield From Changes in Management of National Forests in the North Platte Basin (Final Report) (2000) (prepared for the Platte ***River*** EIS Office). [↑](#footnote-ref-53)
53. 53See H.B. 1092, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-54)
54. 54Peter H. Gleick, Water: The Potential Consequences of Climate Variability and Change for the Water Resources of the United States 4, 31-32 (2000) (the Water Sector Assessment Team of the National Assessment of the Potential Consequences of Climactic Variability and Change prepared this report for the U.S. Global Change Research Program). [↑](#footnote-ref-55)
55. 55The significance of climatic variability and change in the South Platte and Upper ***Colorado*** basins is the subject of the ongoing Western Water Assessment, a joint research project of the National Oceanic and Atmospheric Administration ("NOAA") and the Cooperative Institute for Research in Environmental Sciences ("CIRES"), University of ***Colorado***. Discussion on the Western Water Assessment is available at [*http://sciencepolicy.****colorado****.edu/wwa/*](http://sciencepolicy.colorado.edu/wwa/). [↑](#footnote-ref-56)
56. 56Interview with Greg Walcher, Exec. Dir., ***Colo.*** Dept. of Natural Res., in Denver, ***Colo.*** (Jan. 13, 2003). [↑](#footnote-ref-57)
57. 57MacDonnell, supra note 33, at 258-59. [↑](#footnote-ref-58)
58. 58Id. at 259. [↑](#footnote-ref-59)
59. 59See Charles W. Howe et al., Transaction Costs as Determinants of Water Transfers, 61 U. ***Colo.*** L. Rev. 393, 394-405 (1990). [↑](#footnote-ref-60)
60. 60[*Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson, 990 P.2d 46, 58 (****Colo.*** *1999).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3Y27-KN70-0039-40TN-00000-00&context=1516831) [↑](#footnote-ref-61)
61. 61Michael F. Browning, A Summary of ***Colorado*** Water Law, 21 ***Colo.*** Law. 63, 64 (1992). [↑](#footnote-ref-62)
62. 62See generally id. [↑](#footnote-ref-63)
63. 63For example, legal costs for a simple domestic well augmentation plan can easily exceed $ 1,000 for less than 0.1 acre feet of senior decreed consumptive use water worth no more than $ 100. [↑](#footnote-ref-64)
64. 64[*Bd. of County Comm'rs of County of Arapahoe v. Crystal Creek Homeowners Ass'n, 14 P.3d 325, 329 (****Colo.*** *2000).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:41PW-C4S0-0039-403H-00000-00&context=1516831) [↑](#footnote-ref-65)
65. 65[*Bagwell v. V-Heart Ranch, Inc., 690 P.2d 1271, 1272 (****Colo.*** *1984).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-14H0-003D-90GB-00000-00&context=1516831) [↑](#footnote-ref-66)
66. 66See Nat'l Research Council, Committee on Western Water Management, Water Transfers in the West: Efficiency, Equity, and the Environment 43 (1992). ***Colorado***-Big Thompson (C-BT) shares are the exception that proves the rule; information (yield and price) for C-BT shares is both good and widely available, and the market in C-BT shares is the most developed in the nation. [↑](#footnote-ref-67)
67. 67[*Santa Fe Trail Ranches Property Owners Ass'n v. Simpson, 990 P.2d 46, 52-54 (****Colo.*** *1999).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3Y27-KN70-0039-40TN-00000-00&context=1516831) [↑](#footnote-ref-68)
68. 68[***Colo.*** *Rev. Stat. 37-92-305(3)*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J3G3-00000-00&context=1516831) (2002). [↑](#footnote-ref-69)
69. 69E-mail from Carol Ellinghouse, P.E., Coordinator of Water Res., City of Boulder, ***Colo.***, to authors (May 12, 2003) (on file with author). [↑](#footnote-ref-70)
70. 70Note that prices are likely to go up due to reduced transaction costs. To the extent that transactions costs paid by the buyer are lowered (e.g., the cost of finding willing sellers), the buyer can now offer a slightly higher purchase price for the water since this added expense is offset (or perhaps more than offset) by the reduced transactions costs. See [*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 34-42. [↑](#footnote-ref-71)
71. 71Water Market Indicators, in Water Strategist: Analysis of Water marketing, Finance, Legislation and Litigation 8 (Rodney T. Smith ed., Nov. 2002). [↑](#footnote-ref-72)
72. 72Under ***Colorado*** law, foreign water is the term applied to water imported from other watersheds. This water is highly valued because it can be completely consumed or used to "extinction", unlike native water whose return flows must be available for use by downstream appropriation. Few restrictions are placed on the timing and use of foreign water. See, e.g., [*City of Thornton v. Bijou Irrigation* ***Co****., 926 P.2d 1, 70 (****Colo.*** *1996).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX3-YVT0-003D-916Y-00000-00&context=1516831) [↑](#footnote-ref-73)
73. 73MacDonnell, supra note 33, at 52-53. [↑](#footnote-ref-74)
74. 74Interview with Roger L. "Bud" O'Hara, supra note 29. [↑](#footnote-ref-75)
75. 75Nonetheless, many attorneys still recommend going through the change of use procedure for transfers of foreign water. Id.; Telephone interview with Roger L. "Bud" O'Hara, Water Res. Div. Manager, Bd. of Water Works (Aug. 2, 2001). [↑](#footnote-ref-76)
76. 76Interview with Eric Wilkinson, Gen. Manager, N. ***Colo.*** Water Conservancy Dist., in Loveland, ***Colo.*** (July 20, 1999). [↑](#footnote-ref-77)
77. 77Water Market Indicators, in Water Strategist: Analysis of Water marketing, Finance, Legislation and Litigation 6 (Rodney T. Smith & Roger Vaughan eds., June 2000). Calculated based on 0.5 acre-feet per unit firm yield; Interview with Eric Wilkinson, supra note 76. Prices reached $ 28,000 in September 2002, with continuing drought conditions expected to push prices higher. Water Strategist, supra note 68, at 9-10. The 2002 drought reduced the 2003 allotment to 0.3 acre-feet per unit, implying a new, lower firm yield, that would indicate per acre-foot prices fifty percent higher than discussed. Id. at 9. [↑](#footnote-ref-78)
78. 78Interview with Eric Wilkinson, supra note 76. [↑](#footnote-ref-79)
79. 79N. ***Colo.*** Water Conservancy Dist., C-BT Ownership (2003) (on file with author). [↑](#footnote-ref-80)
80. 80[*Am. Water Dev., Inc. v. City of Alamosa, 874 P.2d 352, 357, 359 (****Colo.*** *1994).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-05H0-003D-93NC-00000-00&context=1516831) [↑](#footnote-ref-81)
81. 81[*Id.at 368.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-05H0-003D-93NC-00000-00&context=1516831) [↑](#footnote-ref-82)
82. 82See James N. Corbridge, Jr. & Teresa A. Rice, Vranesh's ***Colorado*** Water Law 525-526 (Rev. ed. 1999). [↑](#footnote-ref-83)
83. 83[***Colo.*** *Rev. Stat. 37-92-301(4)(a)(I)*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J3FY-00000-00&context=1516831) (2002). [↑](#footnote-ref-84)
84. 84In many cases, parties have been enticed to give up a percentage of their rights in order to settle a dispute with their opponents, largely out of fear of the costs of litigation. Interview with Richard Stenzel, [then] Div. Eng'r, Water Div. No. 1, in Greeley, ***Colo.*** (Oct. 15, 1999); Interview with Eric Wilkinson, supra note 76; Interview with James R. "Jay" Montgomery, Esq., Moses, Wittenyer, Harrison & Woodruff, P.C., in Boulder, ***Colo.*** (Oct. 25, 1999). [↑](#footnote-ref-85)
85. 85[*City & County of Denver v. Consolidated Ditch* ***Co****., 807 P.2d 23, 34 (****Colo.*** *1991).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-0NB0-003D-92HN-00000-00&context=1516831) [↑](#footnote-ref-86)
86. 86This issue has yet to be litigated, although it seems inevitable that it will be. David C. Hallford, [former] Gen. Counsel, ***Colo.*** ***River*** Water Conservancy Dist., Address at the ***Colorado*** Water Congress Summer Convention (Aug. 27, 1999). [↑](#footnote-ref-87)
87. 87[***Colo.*** *Rev. Stat. 37-92-103(5)*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:689F-SY73-CGX8-03R2-00000-00&context=1516831), -302(1)(a). [↑](#footnote-ref-88)
88. 88Interview with Eric Wilkinson, supra note 76. [↑](#footnote-ref-89)
89. 89Nichols et al., supra note 2, at 145. [↑](#footnote-ref-90)
90. 90Id.at 114. [↑](#footnote-ref-91)
91. 91Interview with Robert E. Brogden, supra note 25. [↑](#footnote-ref-92)
92. 92Nichols et al., supra note 2, at 80. [↑](#footnote-ref-93)
93. 93Id.at 40-41. [↑](#footnote-ref-94)
94. 94Id.at 105. [↑](#footnote-ref-95)
95. 95Id.at 69. [↑](#footnote-ref-96)
96. 96Id.at 56. [↑](#footnote-ref-97)
97. 97Nichols et al., supra note 2, at 39. [↑](#footnote-ref-98)
98. 98Id.at 40. [↑](#footnote-ref-99)
99. 99Id. [↑](#footnote-ref-100)
100. 100Id. [↑](#footnote-ref-101)
101. 101Id. [↑](#footnote-ref-102)
102. 102Nichols et al., supra note 2, at 40. [↑](#footnote-ref-103)
103. 103Id. [↑](#footnote-ref-104)
104. 104Id. [↑](#footnote-ref-105)
105. 105Id. [↑](#footnote-ref-106)
106. 106The Northern ***Colorado*** Water Conservancy District ("Northern") is one of the major trans-basin diverters in the state through the C-BT project. Northern's policy towards compensation of basins-of-origin has not changed in the forty years since the project was completed. When the C-BT project was built, the Front Range compensated the West Slope with compensatory storage at Green Mountain, and paid for additional compensatory storage when Windy Gap was built. Northern does not perceive that it has any further compensatory responsibility. Interview with Lee Rozaklis, P.E., Hydrosphere Res. Consultants, Inc., in Boulder, ***Colo.*** (July 20, 1999). [↑](#footnote-ref-107)
107. 107Nichols et al., supra note 2, at 40; Act of Feb. 25, 1943, ch. 191, 1943 ***Colo.*** Laws 633 (codified at [***Colo.*** *Rev. Stat. 37-45-118(1)(b)(II)*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:630C-HT23-GXJ9-34D9-00000-00&context=1516831) (2002)). [↑](#footnote-ref-108)
108. 108Nichols et al., supra note 2, at 40. [↑](#footnote-ref-109)
109. 109Id. [↑](#footnote-ref-110)
110. 110Id. [↑](#footnote-ref-111)
111. 111Id. [↑](#footnote-ref-112)
112. 112Id. [↑](#footnote-ref-113)
113. 113Interview with Rod Kuharich, [former] Government Affairs Manager, ***Colo.*** Springs Utilities, in ***Colo.*** Springs, ***Colo.*** (June 30, 1999). Exceptions are C-BT, and Denver Water"s Moffat and Dillon systems, which divert year round. Although these diversions rely on releases from replacement storage, they can contribute to locally significant low flows. [↑](#footnote-ref-114)
114. 114Nichols et al., supra note 2, at 40.

     The growth of the West Slope recreation economy complicates the relationship with the East Slope on water matters. For example, proponents of West Slope recreational-based economies need to protect local supplies for resorts and environmental amenities, but also recognize that East Slope economic growth is key to a healthy customer base. Additionally, many trans-basin diversion facilities located on the West Slope, such as Dillon Reservoir, are themselves highly valuable recreational destinations. [↑](#footnote-ref-115)
115. 115Id. at 40-41. "Residents of the San Luis Valley and the Gunnison ***River*** Basin, for example, attacked … proposed trans-diversions as threatening local lifestyles, economies, and environmental quality." Id.at 41 n.175. [↑](#footnote-ref-116)
116. 116Marc Reisner, Cadillac Desert 59-96 (1993). [↑](#footnote-ref-117)
117. 117This may be one impetus behind the formation of "***Colorado*** 58," a coalition of 58 ***Colorado*** counties outside the Denver metro area proposing "win-win" solutions to preserve the vitality of rural ***Colorado*** while meeting urban water needs. No Drought of Ideas, The Denver Post, Dec. 1, 2002, at E6. [↑](#footnote-ref-118)
118. 118[*FWS Land & Cattle* ***Co****. v. State Div. of Wildlife, 795 P.2d 837, 841 (****Colo.*** *1990);*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-0RC0-003D-9353-00000-00&context=1516831) Nichols et al., supra note 2, at 41. [↑](#footnote-ref-119)
119. 119Nichols et al., supra note 2, at 41-42. [↑](#footnote-ref-120)
120. 120Id. at 41. "In 2001, for example, Senator Gigi Dennis offered an amendment to S.B. 148 that would have required county approval to move water from agriculture to urban uses outside of the county. The proposed amendment lost 27 to 8." Id.at n.177. [↑](#footnote-ref-121)
121. 121Interview with Greg Walcher, supra note 56. The legislature authorized water courts to impose transitional property tax mitigation and bonded indebtedness payments on the removal of water that results in the transfer of more than 1000 acre-feet of annual consumptive use more than twenty miles. S.B. 155, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-122)
122. 122Nichols et al., supra note 2, at 41. [↑](#footnote-ref-123)
123. 123Id. [↑](#footnote-ref-124)
124. 124[*Bd. of County Comm'rs of Arapahoe County v. Crystal Creek Homeowner's Ass'n, 14 P.3d 325, 329-30 (****Colo.*** *2000).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:41PW-C4S0-0039-403H-00000-00&context=1516831) [↑](#footnote-ref-125)
125. 125See generally id. [↑](#footnote-ref-126)
126. 126[*Am. Water Dev., Inc. v. City of Alamosa, 874 P.2d 352, 358 (****Colo.*** *1994).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-05H0-003D-93NC-00000-00&context=1516831) [↑](#footnote-ref-127)
127. 127See generally id. [↑](#footnote-ref-128)
128. 128Gary Gerhardt, Written in Sand Adjacent to Big Dunes and Astride Aquifer, Baca Ranch Faces Conflict, Uncertainty, Rocky Mountain News, Oct. 15, 2000, at [*16*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T632-8T6X-732T-00000-00&context=1516831)A. [↑](#footnote-ref-129)
129. 129Great Sand Dunes National Park & Preserve Act of 2000, Pub. L. No. 106-530, ***114 Stat. 2527*** (codified at [*16 U.S.C. 410hhh*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H0PH-00000-00&context=1516831) through [*4*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T3H2-D6RV-H37G-00000-00&context=1516831)[*10*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T552-8T6X-7328-00000-00&context=1516831)hhh-9 (2000)). [↑](#footnote-ref-130)
130. 130[*16 U.S.C. 410hhh-6*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H0PR-00000-00&context=1516831)(c). [↑](#footnote-ref-131)
131. 131Id. 410hhh-7(e). [↑](#footnote-ref-132)
132. 132Threats of legislation to prohibit trans-basin diversions extend back decades, perhaps longer. The latest incarnation, a proposal by Rep. Carl Miller (D-Leadville), would have prohibited water courts from decreeing a new trans-mountain water right to an applicant who has the right to develop any Denver basin aquifers, essentially the entire urban Front Range, unless the applicant demonstrates that it is putting to beneficial use its maximum entitlement to that groundwater. H.B. 03-1090, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). Another 2003 proposal, by Rep. Lola Spradley (R - Southern ***Colo.***) would have given water courts authority to impose terms and conditions on trans-basin diversions to protect downstream water rights from significant changes in the quality of water available to meet the needs for which such water right has normally been used. H.B. 1146, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-133)
133. 133***Colo.*** Water Partnership, [*http://www.bestchamber.com/cwpsite*](http://www.bestchamber.com/cwpsite). [↑](#footnote-ref-134)
134. 134S.B. 215, 62nd Gen. Assem., 2nd Reg. Sess. (***Colo.*** 2000). [↑](#footnote-ref-135)
135. 135Telephone interview with Richard D. MacRavey, Exec. Dir., ***Colo.*** Water Congress (June 28, 2000). [↑](#footnote-ref-136)
136. 136Letter from Reps. Joel Hefley, Bob Schaffer, & Thomas G. Tancredo, to Hon. Gale Norton, Sec'y of the Interior (July 18, 2001). See also letter from John A. Brackney, Arapahoe County Water & Wastewater Auth., to Brent Uilenberg, Bureau of Reclamation (July 19, 2001). [↑](#footnote-ref-137)
137. 137Greg Avery, Coalition Again Asks for Water Projects: Communities Seek Authorization of $ 10 Billion in Debt for Reservoirs, Daily Camera, Dec. 20, 2002, at [*1*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2X2-D6RV-H374-00000-00&context=1516831)B. The legislature referred a measure to the electorate to authorize $ 2 billion in revenue bonds for water infrastructure improvements. S.B. 236, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-138)
138. 138Interview with Sara Duncan, Esq., Manager of Intergovernmental Affairs, Denver Bd. of Water Comm'rs, in Denver, ***Colo.*** (June 16, 2000). [↑](#footnote-ref-139)
139. 139U.S. Gen. Accounting Office, Federal Lands: Information on Land Owned and on Acreage with Conservation Restrictions, Pub. No. RCED-95-73FS 26 (1995),at [*http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi*](http://frwebgate.access.gpo.gov/cgi-bin/multidb.cgi). [↑](#footnote-ref-140)
140. 140U.S. Dept. of Agriculture, National Water & Climate Center, Foreword, Water Supply Outlook Reports, at [*http://www.wcc.nrcs.usda.gov/water/quantity/foreword.html*](http://www.wcc.nrcs.usda.gov/water/quantity/foreword.html). [↑](#footnote-ref-141)
141. 141[*16 U.S.C. 1131*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S7X-DBF2-D6RV-H4B8-00000-00&context=1516831) (2000). [↑](#footnote-ref-142)
142. 142[*42 U.S.C. 4321.*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SHT-0722-D6RV-H24F-00000-00&context=1516831) [↑](#footnote-ref-143)
143. 143[*33 U.S.C. 1251.*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0FN2-D6RV-H3DC-00000-00&context=1516831) [↑](#footnote-ref-144)
144. 144[*16 U.S.C. 1531.*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S8T-0KG2-8T6X-707Y-00000-00&context=1516831) [↑](#footnote-ref-145)
145. 145The Denver Water Board held water rights in the dam and reservoir area since 1902 and in 1931 obtained a dam construction right-of-way. Luecke, supra note 50, at 24. [↑](#footnote-ref-146)
146. 146Id. at 25. [↑](#footnote-ref-147)
147. 147Leo Eisel & J. David Aiken, Platte ***River*** Basin Study 43 (1997) (report to the Western Water Policy Review Advisory Comm'n). [↑](#footnote-ref-148)
148. 148Luecke, supra note 50, at 27. [↑](#footnote-ref-149)
149. 149[*33 U.S.C. 1344*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0FN2-D6RV-H3HD-00000-00&context=1516831) (2000). [↑](#footnote-ref-150)
150. 150Luecke, supra note 50, at 27. [↑](#footnote-ref-151)
151. 151[*33 U.S.C. 1344*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0FN2-D6RV-H3HD-00000-00&context=1516831)(c). [↑](#footnote-ref-152)
152. 152Telephone interview with Bennett W. Raley, Esq., [former] Gen. Counsel, N. ***Colo.*** Water Conservancy Dist. (Aug. 10, 1999). [↑](#footnote-ref-153)
153. 153[*16 U.S.C. 1531*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S8T-0KG2-8T6X-707Y-00000-00&context=1516831)(b). [↑](#footnote-ref-154)
154. 154William Perry Pendley, War on the West: Government Tyranny on America's Great Frontier 86 (1995). [↑](#footnote-ref-155)
155. 155[*16 U.S.C. 1538*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S8T-0KG2-8T6X-7087-00000-00&context=1516831)(a)(1). [↑](#footnote-ref-156)
156. 156Id. 1532(19). [↑](#footnote-ref-157)
157. 157Id. 1538(a)(1), 1532(19); [*Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 515 U.S. 687, 696-98 (1995).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S0D-H4T0-003B-R24C-00000-00&context=1516831) [↑](#footnote-ref-158)
158. 158[*16 U.S.C. 1536*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8S8T-0KG2-8T6X-7084-00000-00&context=1516831)(a)(1). [↑](#footnote-ref-159)
159. 159[*Riverside Irrigation Dist. v. Andrews, 758 F.2d 508 (10th Cir. 1985).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-J0D0-0039-P2V3-00000-00&context=1516831) [↑](#footnote-ref-160)
160. 160The Corps' denial of a permit was challenged as a violation of the "Wallop Amendment" of the Clean Water Act, [*33 U.S.C. 1251*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0FN2-D6RV-H3DC-00000-00&context=1516831)(g), which prohibits federal actions that impair the rights of states to allocate water within its jurisdiction. In [*Riverside Irrigation Dist. v. Andrews, 758 F.2d 508 (10th Cir. 1985),*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-J0D0-0039-P2V3-00000-00&context=1516831) the court found that while the "Wallop Amendment" indicates "that Congress did not want to interfere any more than necessary with state water management," [*Id. at 513*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-J0D0-0039-P2V3-00000-00&context=1516831) (citing [*Nat'l Wildlife Fed'n v. Gorsuch, 693 F.2d 156, 178 (D.C. Cir. 1982),*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) Congress intended an accommodation where both the state's interest in allocating water and the federal government's interest in protecting the environment are present. Id. However, the Riverside Court then trumped state law when it held that the "Corps did not exceed its authority in denying a nationwide permit based on its determination that the depletion … of water would adversely affect the critical habitat of the whooping crane." Id. Also worthy of review with regard to this issue is [*United States v. Glenn-Colusa Irrigation District, 788 F. Supp. 1126 (E.D. Cal. 1992).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4N-RBV0-008H-F0Y7-00000-00&context=1516831) [↑](#footnote-ref-161)
161. 161For example, Section 7 consultations approved additional depletions of 135,276 acre-feet per year on the ***Colorado*** ***River*** from 1/1988 through 9/30/2002, a thirteen percent increase over historic depletions. Memorandum from Water Consult, Engineering and Planning Consultants, to Executive Committee, ***Colo.*** Water Congress ***Colo.*** ***River*** Project, at tbl.1 (Dec. 19, 2002). [↑](#footnote-ref-162)
162. 162See [***Colo.*** *Rev. Stat. 24-65.1-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WVF1-DYDC-J408-00000-00&context=1516831) to -502 (2002); Nichols et al., supra note 2, at 65-78. [↑](#footnote-ref-163)
163. 163Nichols et al., supra note 2, at 55. [↑](#footnote-ref-164)
164. 164Id. at 63. [↑](#footnote-ref-165)
165. 165The Bureau of Reclamation is required to release up to 21,650 acre-feet from Ruedi Reservoir to augment natural flows to meet the needs of endangered fish in western ***Colorado***. Water users are committed to providing 10,825 acre-feet from existing or new storage facilities, which will reduce the Bureau's obligation by a corresponding amount. An additional 20,000 acre-feet is sought to enhance spring peak flows. U.S. Fish & Wildlife Serv., Final Programmatic Biological Opinion for Bureau of Reclamation"s Operations and Depletions, Other Depletions, and Funding and Implementation of Recovery Program Actions in the Upper ***Colorado*** ***River*** Above the Gunnison ***River*** 8-9, 11 (1999). This water will be delivered to the fifteen-mile reach from existing or new storage facilities above the Grand Valley, such as the existing Wolford Mountain Reservoir or a new Wolcott Reservoir. Brown et al., Phase 1 Coordinated Facilities Water Availability Study for the Endangered Fishes of the Upper ***Colorado*** ***River***, at ES-1 to ES-3 (2000) (prepared for the ***Colo.*** Water Conservation Bd.). [↑](#footnote-ref-166)
166. 166[***Colo.*** *Rev. Stat. 24-65.1-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WVF1-DYDC-J408-00000-00&context=1516831) to -502 (2002). [↑](#footnote-ref-167)
167. 167Id. 29-20-101 to -205. [↑](#footnote-ref-168)
168. 168[*City & County of Denver v. Bd. of County Comm'rs of Grand County, 760 P.2d 656, 659 (****Colo.*** *1988).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-3CG0-003D-91FG-00000-00&context=1516831) [↑](#footnote-ref-169)
169. 169See, e.g., id. at 765-66; [*City of* ***Colo.*** *Springs v. Bd. of County Comm'rs of Eagle County, 895 P.2d 1105, 1113, 1116 (****Colo.*** *App. 1994).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-2FY0-003D-93GY-00000-00&context=1516831) [↑](#footnote-ref-170)
170. 170Corbridge & Rice, supra note 82, at 525. [↑](#footnote-ref-171)
171. 171Id. [↑](#footnote-ref-172)
172. 172Id. [↑](#footnote-ref-173)
173. 173Id. [↑](#footnote-ref-174)
174. 174Id. [↑](#footnote-ref-175)
175. 175[*City of* ***Colo.*** *Springs v. Bd. of County Comm'rs of Eagle County, 895 P.2d 1105, 1109 (****Colo.*** *App. 1994).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-2FY0-003D-93GY-00000-00&context=1516831) [↑](#footnote-ref-176)
176. 176Id. [↑](#footnote-ref-177)
177. 177Id. [↑](#footnote-ref-178)
178. 178Interview with Douglas Kemper, Manager of Water Res., City of Aurora, ***Colo.***, in Aurora, ***Colo.*** (June 23, 1999). Aurora's South Park conjunctive use project has not, however, proven to be any more successful than some proposed trans-basin diversions. [↑](#footnote-ref-179)
179. 179Sarah F. Bates et al., Searching out the Headwaters: Change and Rediscovery in Western Water Policy 42-47 (1993). [↑](#footnote-ref-180)
180. 180Interview with Greg Walcher, supra note 56. [↑](#footnote-ref-181)
181. 181Id. [↑](#footnote-ref-182)
182. 182Tom Kenworthy, West's Dry Areas Get Creative With Water Use; Residents Seek Long-Term Solutions to Fight Drought, USA Today, Dec. 19, 2002, 2002 WL 4739591. [↑](#footnote-ref-183)
183. 183Nichols et al., supra note 2, at fig.13a. [↑](#footnote-ref-184)
184. 184[*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 23-25. [↑](#footnote-ref-185)
185. 185Solley et al., supra note 22, at 11. [↑](#footnote-ref-186)
186. 186Hon. Bruce Babbitt, [then] Sec'y of the U.S. Dep't of Interior, Address at the Natural Resources Law Center Water Conference on Strategies in Western Water Law and Policy: Courts, Coercion and Collaboration (June 8, 1999). [↑](#footnote-ref-187)
187. 187[*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 24-25. [↑](#footnote-ref-188)
188. 188[*Orr v. Arapahoe Water & Sanitation Dist., 753 P.2d 1217, 1223-24 (****Colo.*** *1988).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX4-0YN0-003D-94SF-00000-00&context=1516831) [↑](#footnote-ref-189)
189. 189[*City of Thornton v. Bijou Irrigation* ***Co****., 926 P.2d 1, 66 (****Colo.*** *1996).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RX3-YVT0-003D-916Y-00000-00&context=1516831) [↑](#footnote-ref-190)
190. 190Teresa A. Rice & Lawrence J. MacDonnell, Agricultural to Urban Water Transfers in ***Colorado***: An Assessment of the Issues and Options 1 (1993). [↑](#footnote-ref-191)
191. 191[*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 45-52. [↑](#footnote-ref-192)
192. 192Id.at 5. [↑](#footnote-ref-193)
193. 193Id.at 45. [↑](#footnote-ref-194)
194. 194Id.at 47-49. [↑](#footnote-ref-195)
195. 195See, e.g., MacDonnell, supra note 33, at 56-59. [↑](#footnote-ref-196)
196. 196H.B. 1113, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-197)
197. 197Deb Frazier & Jerd Smith, Water Wrangles on Tap: Legislature Facing a Flood of Bills on Drought; Many Agree Compromise is Key, Rocky Mountain News, Jan. 7, 2003, [*www.rockymountainnews.com/drmn/state/article/0.1299*](HTTP://www.rockymountainnews.com/drmn/state/article/0.1299),DRMN 21 1656 167,00.html. [↑](#footnote-ref-198)
198. 198The hallmark of the prior appropriations system is the concept of "first-in-time, first-in-right." This notion allows for the establishment of a priority system to determine the proper allocation of water amongst users on a stream when supplies are insufficient to satisfy all demands. Priority is based on seniority, meaning that "senior" rights holders are those who first established a pattern of water use - as recognized in a permit or decree - as compared to more "junior" users. Seniority is important since in a water short year senior water right holders will receive all of their water before any junior water right holders. In order to obtain the water to which it is entitled, a senior water right holder may place a "call on the ***river***," which requires upstream junior rights holders to cease diversions until more senior users receive their full entitlements. [↑](#footnote-ref-199)
199. 199See MacDonnell, supra note 33, at 262. [↑](#footnote-ref-200)
200. 200The "great and growing cities doctrine" allows municipalities to acquire water for future needs. See generally [*City & County of Denver v. Sheriff, 96 P.2d 836 (****Colo.*** *1939).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3RRM-Y2M0-0040-011T-00000-00&context=1516831) [↑](#footnote-ref-201)
201. 201Interview with Douglas Kemper, supra note 178. Interview with Roger L. "Bud" O'Hara, supra note 29. [↑](#footnote-ref-202)
202. 202Interview with Roger L. "Bud" O'Hara, supra note 29. [↑](#footnote-ref-203)
203. 203E-mail from Carol Ellinghouse, supra note 69. [↑](#footnote-ref-204)
204. 204Theo Stein, Eco-Groups: Conservation, Not Dams, can Supply Water, The Denver Post, Jan. 15, 2003, at B1. [↑](#footnote-ref-205)
205. 205The crucial question raised by a subordination agreement is whether all juniors benefit when the Division Engineer administers the agreement. Orlyn Bell believed that it was not practical to administer a subordination agreement selectively in favor of a single water right. Telephone interview with Orlyn J. Bell, [then] Div. Eng'r, Water Dist. No. 5, ***Colo.*** Div. of Water Res. (May 15, 2000). If a subordination agreement is not selectively administered, all juniors will benefit from removing the call, not just the contracting party. As a practical consequence, this eliminates any benefit from a subordination agreement if there are any significant upstream juniors who could first benefit from and take the subordinated water. [↑](#footnote-ref-206)
206. 206Such agreements are common provisions in water rights settlements. [↑](#footnote-ref-207)
207. 207Office of State Eng'r, ***Colo.*** Div. of Water Res., Signing of the Aspinall Subordination Agreement, 14 ***Colo.*** Stream Lines 1 (Nov. 2000). [↑](#footnote-ref-208)
208. 208Formerly Public Service of ***Colo.*** [↑](#footnote-ref-209)
209. 209***Colo.*** Water Conservation Bd., ***Colorado*** ***River*** Mainstem Basin Facts, Jan. 2000, at 2. [↑](#footnote-ref-210)
210. 210Letter from Bryant O'Donnell, Executive Vice President & Gen. Counsel, Public Service ***Co***. of ***Colo.***, to William H. Miller, Manager, Denver Bd. of Water Comm'rs 1-2 (Apr. 14, 1986) (on file with author). [↑](#footnote-ref-211)
211. 211Id. [↑](#footnote-ref-212)
212. 212Interview with Sara Duncan, Esq., supra note 138. [↑](#footnote-ref-213)
213. 213Agreement concerning Proposed Operation of the Shoshone Power Call Between ***Colorado*** ***River*** Water Conservation District and City and County of Denver (Mar. 21, 2003). [↑](#footnote-ref-214)
214. 214Id. PP 2 & 3. [↑](#footnote-ref-215)
215. 215Id. P 8. [↑](#footnote-ref-216)
216. 216Id. P 7. [↑](#footnote-ref-217)
217. 217[*Bd. of County Comm'rs of Arapahoe County v. Crystal Creek Homeowners Ass'n, 14 P.3d 325, 341 (****Colo.*** *2000).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:41PW-C4S0-0039-403H-00000-00&context=1516831) [↑](#footnote-ref-218)
218. 218Margie Wood, ***Colorado*** Economist Says Farming Areas Should Consider Water Leases, The Pueblo Chieftan, Jan. 14, 2003, 2003 WL 10238106. [↑](#footnote-ref-219)
219. 219[*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 32. [↑](#footnote-ref-220)
220. 220Wood, supra note 218. [↑](#footnote-ref-221)
221. 221Wood, supra note 218, at 2. [↑](#footnote-ref-222)
222. 222See GEI Consultants, Inc., supra note 6, at 8-46 to 8-47. [↑](#footnote-ref-223)
223. 223The Metropolitan Water District of Southern California, or example, recently "initiated a [statewide] competitive [bidding] process to purchase options on up to 100,000 acre-feet of water for transfer into its service area during dry years and supply interruption." Is the California Water Market Open for Business?, Western Water, Mar./Apr. 2001, at 5. [↑](#footnote-ref-224)
224. 224GEI Consultants, Inc., supra note 6, at 8-49. [↑](#footnote-ref-225)
225. 225H.B. 1334, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-226)
226. 226Interview with Eric Wilkinson, supra note 76. [↑](#footnote-ref-227)
227. 227Interview with [retired] Sen. Fred Anderson, in Loveland, ***Colo.*** (July 19, 1999). [↑](#footnote-ref-228)
228. 228Id. [↑](#footnote-ref-229)
229. 229Id. [↑](#footnote-ref-230)
230. 230Id. [↑](#footnote-ref-231)
231. 231Wood, supra note 218. [↑](#footnote-ref-232)
232. 232Id. [↑](#footnote-ref-233)
233. 233Id. [↑](#footnote-ref-234)
234. 234These agreements are analogous to a common plan of augmentation wherein a single entity creates dry-year options using water rights it owns. For example, Boulder uses some of its water rights to maintain agricultural land in normal or wet years, but these rights are also decreed for municipal purposes to meet the city's needs in dry years. Interview with James R. "Jay" Montgomery, Esq., supra note 84. [↑](#footnote-ref-235)
235. 235Interview with Bennett W. Raley, [former] Gen. Counsel, N. ***Colo.*** Water Conservancy Dist., in Denver, ***Colo.*** (Oct 14, 1999). [↑](#footnote-ref-236)
236. 236Id. [↑](#footnote-ref-237)
237. 237Id. [↑](#footnote-ref-238)
238. 238Interview with Roger L. "Bud" O'Hara, supra note 29. [↑](#footnote-ref-239)
239. 239Id. [↑](#footnote-ref-240)
240. 240Id. [↑](#footnote-ref-241)
241. 241Transactions, in Water Strategist: Analysis of Water marketing, Finance, Legislation and Litigation 8 (Rodney T. Smith & Roger Vaughan eds., June 1999). [↑](#footnote-ref-242)
242. 242Interview with Eric Kuhn, Manager, ***Colo.*** ***River*** Water Conservancy Dist., in Glenwood Springs, ***Colo.*** (July 1, 1999). [↑](#footnote-ref-243)
243. 243Interview with Douglas Kemper, supra note 178. [↑](#footnote-ref-244)
244. 244[*Nat'l Research Council, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-1HY0-003B-G1SD-00000-00&context=1516831) note 66, at 31. [↑](#footnote-ref-245)
245. 245Arkansas ***River*** Pilot Water Banking Act of 2001, ch. 284, 2001 ***Colo.*** Sess. Laws 1060 (codified at [***Colo.*** *Rev. Stat. 37-80.5-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J36C-00000-00&context=1516831) to -107 (2002)). [↑](#footnote-ref-246)
246. 246[***Colo.*** *Rev. Stat. 37-80.5-102*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J36D-00000-00&context=1516831) (2002). [↑](#footnote-ref-247)
247. 247Id.37-80.5-106. [↑](#footnote-ref-248)
248. 248Interview with Greg Walcher, supra note 56. [↑](#footnote-ref-249)
249. 249Id. [↑](#footnote-ref-250)
250. 250H.B. 1318, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-251)
251. 251Interview with Bennett W. Raley, supra note 235. [↑](#footnote-ref-252)
252. 252Montgomery Watson, ***Colorado*** Water Development Study 1999 Update 3 (1999) (prepared for the ***Colo.*** Farm Bureau). [↑](#footnote-ref-253)
253. 253Douglas S. Kenney & Roberta Klein, Use and Effectiveness of Municipal Water Restrictions During Drought in ***Colorado*** 12 (2003), at [*http://sciencepolicy.****Colorado****.edu/homepages/roger*](http://sciencepolicy.Colorado.edu/homepages/roger) pielke/hp roger/pdf/2003.16.pdf. [↑](#footnote-ref-254)
254. 254Id. at 11. [↑](#footnote-ref-255)
255. 255Town of Castle Rock Homepage, Utilities Dep't, Water Conservation, at [*http://www.ci.castlerock.****co****.us/Town*](http://www.ci.castlerock.co.us/Town) services/pub works/utilities/water cons.asp (last visited Jan. 13, 2002). [↑](#footnote-ref-256)
256. 256Interview with David Little, Manager of Water Res. Planning, Denver Water (December 30, 2002). [↑](#footnote-ref-257)
257. 257Id. [↑](#footnote-ref-258)
258. 258Water Used at Record Pace, Denver Post, June 25, 2000, 2000 WL 4465761. [↑](#footnote-ref-259)
259. 259The authors' review of summer 2002 water use suggests that even modest restrictions, for example limiting lawn watering to every third day, had significant benefits. [↑](#footnote-ref-260)
260. 260William Graves, When the Well's Dry, We Know the Worth of Water, Nat'l Geographic Special Edition, Nov. 1993, at 1. [↑](#footnote-ref-261)
261. 261The public supply category includes domestic, commercial and industrial purposes, including thermoelectric power production. Solley, supra note 22, at 20 [↑](#footnote-ref-262)
262. 262Id.at 23. [↑](#footnote-ref-263)
263. 263Peter W. Meyer et al., Residential end Uses of Water 114 (1999). [↑](#footnote-ref-264)
264. 264Denver Bd. of Water Comm'rs, supra note 6, at 45. [↑](#footnote-ref-265)
265. 265Riebsame et al., supra note 29, at 56. [↑](#footnote-ref-266)
266. 266H.B. 1001, 64th Gen. Assem., 1st Reg. Sess., 4 (***Colo.*** 2003). [↑](#footnote-ref-267)
267. 267Edwin G. Dolan & David E. Lindsey, Microeconomics 130-31 (5th ed. 1988). [↑](#footnote-ref-268)
268. 268Id.at 136-37. [↑](#footnote-ref-269)
269. 269Ari M. Michelsen et al., Effectiveness of Residential Water Conservation Price and Nonprice Programs, at xxii (1998). [↑](#footnote-ref-270)
270. 270Reclaimed Western Water, in Water Strategist: Analysis of Water marketing, Finance, Legislation and Litigation 8 (Rodney T. Smith & Roger Vaughan eds., Summer 1997). [↑](#footnote-ref-271)
271. 271Id. [↑](#footnote-ref-272)
272. 272Id. [↑](#footnote-ref-273)
273. 273Steve Trivett, Recycled Water Equals Green Links Amid Drought, Rocky Mountain News, May 23, 2002, at [*24*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8T9R-T2H2-8T6X-7316-00000-00&context=1516831)C. [↑](#footnote-ref-274)
274. 274Black & Veatch, Water Resource Plan for ***Colorado*** Springs Utilities, at VI-8 (1996). [↑](#footnote-ref-275)
275. 275Id.at VII-7, IX-4. [↑](#footnote-ref-276)
276. 276For example, during a 1956 drought in the small town of Chanute, Kansas, wastewater was recycled through its "rapid-sand-filtration plant directly into the intake point of its drinking water system with no ill effects." Reclaimed Western Water, supra note 270, at 7. [↑](#footnote-ref-277)
277. 277Interview with Eric Kuhn, Manager, ***Colo.*** ***River*** Water Conservancy Dist., in Glenwood Springs, ***Colo.*** (Dec. 26, 2002). [↑](#footnote-ref-278)
278. 278See generally the consolidated cases of 2782, 5016 and 5017, United States v. N. ***Colo.*** Water Conservation Dist. (D. ***Colo.*** filed Oct. 12 1955) (ruling on the Blue ***River*** Final Decree). [↑](#footnote-ref-279)
279. 279Interviews with Michael D. "Sandy" White, Esq., in Denver, ***Colo.*** (July 12, 1999); Interview with Charles B. "Barney" White, Esq., in Denver, ***Colo.*** (Oct. 7, 1999). [↑](#footnote-ref-280)
280. 280Interview with Charles B. "Barney" White, supra note 279; David Hallford, supra note 86. [↑](#footnote-ref-281)
281. 281Interview with Eric Kuhn, supra note 277. [↑](#footnote-ref-282)
282. 282An exchange occurs when water is taken at a time and place when it would otherwise be out of priority, but other water rights that would be injured are satisfied with replacement water from another source. In short, water is added to the stream at a downstream point to enable diversion of an equal amount of water at an upstream location. Exchanges are often an efficient way for a trans-basin diverter to maximize use of imported foreign water. [↑](#footnote-ref-283)
283. 283Denver Bd. of Water Comm'rs, supra note 6, at 34. [↑](#footnote-ref-284)
284. 284Telephone interview with Myron Nealey, Hydraulic Eng'r, Denver Bd. of Water Comm'rs (June 6, 2001). [↑](#footnote-ref-285)
285. 285Id. [↑](#footnote-ref-286)
286. 286Id. [↑](#footnote-ref-287)
287. 287Id. [↑](#footnote-ref-288)
288. 288Denver Bd. of Water Comm'rs, supra note 6, at 34. [↑](#footnote-ref-289)
289. 289Id. [↑](#footnote-ref-290)
290. 290Id.at 13. [↑](#footnote-ref-291)
291. 291GEI Consultants, Inc., supra note 6, at 4-8 through 4-14. [↑](#footnote-ref-292)
292. 292Id. [↑](#footnote-ref-293)
293. 293Id.at 7-12 to 7-17. [↑](#footnote-ref-294)
294. 294Id.at 7-15 to 7-17. [↑](#footnote-ref-295)
295. 295***Colo.*** Water Congress, SECWCD Moves Forward on Enlargement of Pueblo Reservoir, Water Intelligence Report, Oct. 20, 2000, at 2. [↑](#footnote-ref-296)
296. 296See GEI Consultants, Inc., supra note 6, at 7-12 to 7-14. [↑](#footnote-ref-297)
297. 297[*43 U.S.C. 523*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SDD-0HD2-8T6X-73J8-00000-00&context=1516831) (2000). [↑](#footnote-ref-298)
298. 298Letter from A. Jack Garner, Area Manager, Bureau of Reclamation, U.S. Dep't of Interior, to Steve Arveschoug, [then] Gen. Manager, SECWCD 2 (Nov. 3, 1998). [↑](#footnote-ref-299)
299. 299Letter from John W. Keyes, III, Comm'r, Bureau of Reclamation, U.S. Dep't of Interior, to James Broderick, Project Manager, SECWCD (Apr. 3, 2003). [↑](#footnote-ref-300)
300. 300Tom Pitts, P.E., comments at the ***Colorado*** Water Congress Summer Convention (Aug. 23, 2001). [↑](#footnote-ref-301)
301. 301Beneficiaries include Fort Morgan, Fort Lupton, Broomfield, Hudson, Berthoud, Longmont, Erie, Louisville, Morgan County Quality Water Dist., Little Thompson Water Dist., Cent. Conservancy Water Dist., and Superior Metropolitan Dist. N. ***Colo.*** Water Conservancy Dist., Southern Water Supply Project (2003), at [*http://www.ncwcd.org/project&features/swsp*](http://www.ncwcd.org/project&features/swsp) main.asp [↑](#footnote-ref-302)
302. 302Id. [↑](#footnote-ref-303)
303. 303Id. [↑](#footnote-ref-304)
304. 304Hydrosphere Res. Consultants, Inc. et al., supra note 6, at 129. [↑](#footnote-ref-305)
305. 305Interview with Douglas Kemper, supra note 178. [↑](#footnote-ref-306)
306. 306Interview with Charles B. "Barney" White, supra note 279. [↑](#footnote-ref-307)
307. 307Denver Bd. of Water Comm'rs, Cooperative Actions With Metropolitan Water Suppliers Outside the Board's Service Area (Oct. 15, 1996). [↑](#footnote-ref-308)
308. 308Respect for the Land Translates Into Protection of Natural Environment for Carol Ellinghouse, Instream ***Colorado***, July 2001, at 3. Boulder will use the water to maintain minimum stream flows in South Boulder Creek. [↑](#footnote-ref-309)
309. 309The evolution of the South Metro Water Supply Board, formerly the so-called Tri-Party Alliance, is discussed in Water and Growth in ***Colorado***, Nichols et al., supra note 2, at 107-09. Providers in the northwest Denver Metro area are generally short on storage needed in a critical drought. Changes in operations and/or modification of arrangements between Denver Water and the providers could address much of this shortfall, and is the subject of the Northwest Cooperative Investigation. See generally Hydrosphere Res. Consultants, inc., Northwest Cooperative Investigation, Final Reports for Task 1: Mutual Education, Task 2: Future Baseline Representation, Task 3: Estimate of Future Unused Supply (1999). [↑](#footnote-ref-310)
310. 310Radio show: NPR Morning Addition, Controversial Efforts to Pump Water and Sell it in Texas, hosted by Bob Edwards and reported by John Burnett (October 15, 2002). [↑](#footnote-ref-311)
311. 311See Nichols et al., supra note 2, at 96, 98. [↑](#footnote-ref-312)
312. 312Montgomery Watson, supra note 6. [↑](#footnote-ref-313)
313. 313Interview with Eric Kuhn, supra note 277. [↑](#footnote-ref-314)
314. 314Interview with David C. Hallford, Esq. [then] Gen. Counsel, ***Colo.*** ***River*** Water Conservancy Dist., in Glenwood Springs, ***Colo.*** (July 1, 1999). [↑](#footnote-ref-315)
315. 315Interview with Eric Kuhn, supra note 277. [↑](#footnote-ref-316)
316. 316Id. [↑](#footnote-ref-317)
317. 317Telephone interview with Robert Weaver, Hydrosphere Res. Consultants, Inc. (Dec. 27, 2002). [↑](#footnote-ref-318)
318. 318Id. [↑](#footnote-ref-319)
319. 319Interview with Greg Walcher, supra note 56. [↑](#footnote-ref-320)
320. 320Interview with Eric Kuhn, supra note 277. [↑](#footnote-ref-321)
321. 321E-mail from Hamlet J. "Chips" Barry, III, Manager, Denver Bd. of Water Comm'rs, to authors (May 12, 2003). [↑](#footnote-ref-322)
322. 322Id. [↑](#footnote-ref-323)
323. 323Id. "Compensatory storage" describes a practice in which Eastern Slope interests, in "compensation" for trans-basin diversions, provide water projects designed to store spring runoff for use on the Western Slope, typically for irrigation. This principle was incorporated into the ***Colorado***-Big Thompson (C-BT) Project in 1937. [↑](#footnote-ref-324)
324. 324Id. [↑](#footnote-ref-325)
325. 325Id. [↑](#footnote-ref-326)
326. 326E-mail from Hamlet J. "Chips" Barry, supra note 321. [↑](#footnote-ref-327)
327. 327Id. [↑](#footnote-ref-328)
328. 328E-mail from Richard D. MacRavey, Exec. Dir., ***Colo.*** Water Congress, to authors (July 30, 2001). [↑](#footnote-ref-329)
329. 329Interview with Glenn E. Porzak, Esq., Porzak, Browning, & Bushong, P.C., in Boulder, ***Colo.*** (Aug. 30, 1999). [↑](#footnote-ref-330)
330. 330E-mail from Ed Pokorney, Dir. of Planning, Denver Bd. of Water Comm'rs, to authors (Aug. 20, 2001). [↑](#footnote-ref-331)
331. 331The arrangement provides approximately 1,200 acre-feet to Summit and Grand County communities and ski areas. [↑](#footnote-ref-332)
332. 332Interview with Lee Rozaklis, supra note 106. [↑](#footnote-ref-333)
333. 333Interview with Glenn E. Porzak, supra note 329. [↑](#footnote-ref-334)
334. 334Id. [↑](#footnote-ref-335)
335. 335Id. [↑](#footnote-ref-336)
336. 336E-mail from Lee Rozaklis, Hydrosphere Res. Consultants, Inc., to authors (Jan. 13, 2003). [↑](#footnote-ref-337)
337. 337Id. [↑](#footnote-ref-338)
338. 338Hydrosphere Res. Consultants, Inc. et al., supra note 4, at 55. [↑](#footnote-ref-339)
339. 339E-mail from Rozaklis, supra note 336. [↑](#footnote-ref-340)
340. 340Hydrosphere Res. Consultants, Inc. et al., supra note 6, at 55. [↑](#footnote-ref-341)
341. 341Douglas County Water Res. Auth., Res. No. R-998-02 (Sept. 1998); ***Colo.*** ***River*** Water Conservation Dist./Denver Bd. of Water Comm'rs, Joint Resolution (Nov. 17, 1998). [↑](#footnote-ref-342)
342. 342E-mail from Lee Rozaklis, supra note 336. [↑](#footnote-ref-343)
343. 343Id. [↑](#footnote-ref-344)
344. 344Pat Mulhern, Dist. Manager, Inverness Water & Sanitation Dist., Presentation to Denver Water Planning Meeting (Oct. 4, 2002). [↑](#footnote-ref-345)
345. 345Id. [↑](#footnote-ref-346)
346. 346Id. [↑](#footnote-ref-347)
347. 347E-mail from Lee Rozaklis, supra note 336. [↑](#footnote-ref-348)
348. 348Mulhern, supra note 344. [↑](#footnote-ref-349)
349. 349E-mail from Lee Rozaklis, supra note 336. [↑](#footnote-ref-350)
350. 350Interview with Eric Kuhn, supra note 277. [↑](#footnote-ref-351)
351. 351Interview with Greg Walcher, supra note 56. [↑](#footnote-ref-352)
352. 352***Colo.*** Water Conservation Bd., Scope of Work for a Statewide Water Supply Initiative, Nov. 7, 2002. [↑](#footnote-ref-353)
353. 353Interview with Rod Kuharich, Exec. Dir., ***Colo.*** Water Conservation Bd., in Denver, ***Colo.*** (Dec. 20, 2002). [↑](#footnote-ref-354)
354. 354See ***Colo.*** Water Conservation Bd., supra note 352, at 4. [↑](#footnote-ref-355)
355. 355See generally [***Colo.*** *Rev. Stat. 37-60-106(1)(l)*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J31V-00000-00&context=1516831), -119, -121 (2002) (describing the CWCB's role in water development through annual appropriations of its construction fund). [↑](#footnote-ref-356)
356. 356Press Release, Club 20, Club 20 Spearheads Development of Statewide Water Principles (Oct. 4, 2002) (on file with authors). [↑](#footnote-ref-357)
357. 357Id. [↑](#footnote-ref-358)
358. 358No Drought of Ideas, supra note 117. [↑](#footnote-ref-359)
359. 359Water Factions Reach "Treaty" Sides to Cooperate but Work Remains, The Denver Post, Jan. 25, 2003. [↑](#footnote-ref-360)
360. 360H.J.R. 1019, 64th Gen. Assem., 1st Reg. Sess. (***Colo.*** 2003). [↑](#footnote-ref-361)