

1-1-2006

Basic Storage 101

Casey S. Funk

Follow this and additional works at: <https://digitalcommons.du.edu/wlr>

Custom Citation

Casey S. Funk, Basic Storage 101, 9 U. Denv. Water L. Rev. 519 (2006).

This Article is brought to you for free and open access by the University of Denver Sturm College of Law at Digital Commons @ DU. It has been accepted for inclusion in Water Law Review by an authorized editor of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu, dig-commons@du.edu.

BASIC STORAGE 101

CASEY S. FUNK[†]

I. INTRODUCTION	520
II. THE BASICS.....	521
A. The What	521
B. The Who	522
C. The Where.....	523
D. The When.....	524
E. The Why.....	524
1. Surface Storage.....	524
2. Underground Storage	525
F. The How.....	525
III. COLORADO LAW GOVERNING STORAGE.....	527
A. Constitutional Provisions	527
B. Statutory Provisions.....	527
C. Case Law	528
1. One Fill Rule	528
2. Refill Rights	529
IV. THE ROLE OF THE WATER COURT.....	530
A. Adjudicating a Storage Water Right.....	530
B. Making a Conditional Storage Right Absolute	532
C. Scope of an Absolute Water Storage Right.....	533
D. Changing a Water Storage Right	534
V. THE ROLE OF THE STATE ENGINEER.....	537
A. Administration	537
B. Carry-Over Storage.....	538
C. Storable Inflow	538
D. Paper Fill	539
E. Upstream Storage Statute	539
F. Reporting Measurements.....	541
G. Computed Inflow.....	542
H. Administrative Accounts	542
I. Evaporation Losses.....	544
J. Reservoir Seepage	545
K. Transit Losses	545
L. Decreed Capacity v. Physical Capacity.....	546

[†] The author is an attorney with the Denver Water Board. The views expressed in this article are solely the author's and do not necessarily reflect the position or opinions of the Board of Water Commissioners. Special thanks to Adam Schempp, University of Virginia law student for his citation, research, and editorial skills.

M. Start of Fill	547
N. End of Fill.....	547
O. Storage Accounting Principles.....	547
VI. CONCLUSION.....	551

I. INTRODUCTION

On March 1, 2002, the Denver Water Board's ("Denver Water") system-wide reservoir storage contained 78% of capacity, and the snow pack above its facilities measured 72% of average.¹ Based upon demand projections in a typical year and the expected runoff from the March 1 snow pack, Denver Water forecasted that on July 1, 2002, the combined contents in its reservoir storage would be at 94% of capacity.² Mother Nature, however, had other plans. April and May turned out to be the driest on record.³ The snow pack either quickly melted or evaporated, resulting in the lowest spring runoff in Denver Water's watershed in recorded history.⁴ Due to higher temperatures and minimal rainfall, Denver Water's municipal demand soared above historic levels.⁵ By July 1, 2002, the low natural stream flow above Denver Water's intake eliminated or reduced any exchange potential.⁶ Thus, Denver Water had to release more water from storage. Fires had burned the forest in the watershed above Denver Water's facilities.⁷ Denver Water's combined reservoir storage contained only 71% of capacity, rather than the forecasted 94%, with the highest demand months still ahead.⁸ Consequently, the Denver Water Board imposed mandatory restrictions on water use to curb the rapid drop in reservoir levels.

2002 turned out to be the State of Colorado's worst single year drought in recorded history.⁹ Through demand management and

1. Interview with Robert Steger, Water Res. Eng'r, Denver Water, in Denver, Colo. (June 2, 2005).

2. *Id.*

3. Roger A. Pielke, Sr. et al., *Drought 2002 in Colorado - An Unprecedented Drought or a Routine Drought?*, 162 PURE & APPLIED GEOPHYSICS 1455, 1477 (2005).

4. Steger, *supra* note 1.

5. *Id.*

6. There was very little natural flow of water physically available to divert by exchange. *Id.*

7. The Hayman forest fire which began on June 8, 2002 and was contained on July 2, burned over 137,000 acres. U.S. Forest Serv., *Hayman Fire & Baer Information*, <http://www.fs.fed.us/r2/psicc/hayres/index.htm> (last visited Mar. 25, 2006).

8. In March, 2003, Denver's combined system storage contents reached the historic low level of forty-three percent. Interview with Travis Bray, Raw Water Technician, Denver Water, in Denver, Colo. (June 7, 2005).

9. COLO. DIV. OF WATER RES., 2002 ANNUAL REPORT, http://water.state.co.us/pubs/annualreport/annlrpt_2002.PDF (last visited Apr. 25, 2006).

adequate storage reserves, most municipalities made it through the year without critically running short of water.¹⁰ As the drought continued, municipal water providers made operating and demand management decisions based upon the adequacy of their storage reserves.¹¹ As a result, many decision makers gained a new appreciation for the importance of storage, which had not played a critical role in decision making during the relatively wet years of the eighties and nineties.¹²

This article begins with the basics – the what, who, where, when, why, and how of storage, continues with a summary of Colorado law governing storage and the role of state water courts in adjudicating storage decrees, and concludes with the role of the Colorado Office of the State Engineer (“SEO”) in administering storage under statutes and decrees. This article also identifies various issues confronted over the years, along with the results reached, avoided, or put off for another day.

II. THE BASICS

A. The What

In 1879, the Colorado General Assembly recognized that storage rights are adjudicable water rights.¹³ The term “storage” means “the impoundment, possession, and control of water by means of a dam.”¹⁴

10. However, some municipalities did not. During the drought of 2002, the lack of raw water storage, in part, forced the City of Lafayette with a population of 23,552 to cut back its water consumption by seventy-five percent by limiting outside watering to two hours once a week. LINDA MCCURLEY-STAFFORD, *THE DROUGHT OF 2002 IN BOULDER COUNTY, COLORADO, USA* 3 (2004), <http://www.surf.salford.ac.uk/documents/UrbanVulnerability/McCurley-Stafford.pdf> (last visited Apr. 25, 2006).

11. For example, under Denver Water’s Drought Plan, staff recommended that the Board adopt restriction based upon actual or projected system storage contents as of July 1 of each year. When July 1 system storage contents are expected to be between sixty-six and eight percent, Denver Water would request that its customers voluntarily restrict their use. When July 1 system storage contents are expected to be between forty and sixty-five percent, the Board should impose mandatory water restrictions. When July 1 system storage contents fall below forty percent, the Board should impose a ban on all residential lawn watering. Interview with Marc Waage, Manager of Raw Water Operations, Denver Water, in Denver, Colo. (June 3, 2005).

12. For the period 1980-1999, the natural stream flow in Denver Water’s system averaged 689,129 acre-feet/year (110% of average). For the period 2000-2004, the natural stream flow averaged 440,028 acre-feet/year (70% of average). In 2002, the natural stream flow was 203,723 acre-feet (32% of average). Compare these amounts with the average stream flow for the period 1916-2004 of 627,583 acre-feet/year. Steger, *supra* note 1.

13. COLO. REV. STAT. § 37-87-101 (2005); *see also* § 37-92-103(12) (2005) (“Water right’ means a right to use in accordance with its priority a certain portion of the waters of the state by reason of the appropriation of the same.”).

14. *Id.* § 37-92-103(10.7).

If a water user has a conditional or decreed right, that water user can also store water in underground aquifers if the water is placed in the aquifer by other than natural means.¹⁵ The SEO measures stored water volumetrically, thus expressing the quantity in acre-feet.¹⁶

Storage alone does not constitute beneficial use,¹⁷ unless it prevents flooding.¹⁸ However, storage makes possible subsequent beneficial use of water. A water user need not use stored water within the same year, but has a reasonable time to apply the water to a beneficial use.¹⁹ A water user can deliver stored water to its place of use by “(1) delivery through an artificial ditch or pipe, or (2) delivery through a natural stream channel.”²⁰ For water delivered from storage, the SEO must make allowances for evaporation and other losses to prevent injury to other water users.²¹

B. The Who

Provided a water user meets the legal requirements for the appropriation,²² any party may apply for a storage water right, including the federal government,²³ municipalities,²⁴ conservancy districts,²⁵ conservation districts,²⁶ ditch companies,²⁷ and individuals.²⁸

15. *Id.*

16. *Id.* § 37-80-102(8) (2005). An acre-foot is the amount of water that would cover one acre of land with a depth of one foot. A flow rate of one cubic foot per second for one day is approximately 1.9835 acre-feet per day.

17. *People ex rel. Simpson v. Highland Irrigation Co.*, 917 P.2d 1242, 1251 (Colo. 1996); *Handy Ditch Co. v. Greeley & Loveland Irrigation Co.*, 280 P. 481, 482 (Colo. 1929).

18. *Pueblo W. Metro. Dist. v. Se. Colo. Water Conservancy Dist.*, 689 P.2d 594, 603 (Colo. 1984) (“[C]apture and storage of flood waters may be a ‘beneficial use’ underlying an appropriation of water.”).

19. *N. Sterling Irrigation Dist. v. Riverside Reservoir & Land Co.*, 200 P.2d 933, 935 (Colo. 1948).

20. *Pub. Serv. Co. of Colo. v. Fed. Energy Regulatory Comm’n*, 754 F.2d 1555, 1564 (10th Cir. 1985).

21. COLO. REV. STAT. § 37-87-102(4) (2005).

22. *See id.* § 37-92-302(1)(a).

23. The United States owns, operates, and holds the water rights for Green Mountain Reservoir in Summit County Colorado. *See United States v. N. Colo. Water Conservancy Dist.*, 608 F.2d 422, 425 (10th Cir. 1979).

24. The people of Colorado empowered home rule municipalities to own and operate water supply facilities including storage reservoirs. *See* COLO. CONST. art. XX, § 1; *see also City of Thornton v. Farmers Reservoir & Irrigation Co.*, 575 P.2d 382, 389-90 (Colo. 1978) (holding that the term water works as in the Colorado Constitution includes water and water rights). The legislature also authorized municipalities to own and operate water supply facilities. COLO. REV. STAT. §§ 31-15-708, 31-35-101 (2005). For example, the Denver Water Board owns and operates numerous reservoirs including Dillon, Cheesman, Williams Fork, and Gross Reservoirs. *See generally DENVER WATER BD., DENVER WATER: AN OVERVIEW* (2004), <http://www.water.denver.co.gov/> (follow “About Denver Water” hyperlink; then follow “Who We Are” hyperlink).

C. The Where

Water storage facilities exist throughout the state on rivers or streams, adjacent thereto, and even underground. On-stream reservoirs impound water behind dams constructed across a stream or river. Off-stream reservoirs store water diverted through a feeder ditch or pipeline from an adjacent river or stream. Water users convert pits created by gravel mining or rock quarry operations to off-stream storage facilities. If lined to prevent seepage and infiltration, the SEO considers these pits to be storage facilities.²⁹ If unlined, the SEO treats the pits like wells because they may expose ground water, which is tributary to the stream system and can, therefore, flow into and out of the gravel pits.³⁰ Unlined gravel pits require well permits if groundwater is exposed.³¹

Water may also be stored in underground aquifers if the water is “placed” in storage by other than natural means under a conditional or decreed right.³² To store water in an underground aquifer,

[t]he applicant, at least: (1) must capture, possess, and control the water it intends to put into the aquifer; (2) must not injure other water use rights, either surface or underground, by appropriating the water for recharge; (3) must not injure water use rights, either surface

25. The General Assembly empowered state residents to create water conservancy districts, which are authorized to own, operate, and appropriate water for storage. COLO. REV. STAT. §§ 37-45-102, -118(b)(I)(A), -118(b)(III) (2005).

26. The legislature creates Conservation Districts. Conservation Districts may own, operate, and appropriate water for storage. *See id.* at § 37-46-101, -107(1)(b)-(c).

27. Ditch Companies are authorized by the legislature to own and operate reservoirs. *See* COLO. REV. STAT. § 7-42-101 (2005).

28. COLO. REV. STAT. § 37-87-101(1)(a) (2005) (stating that individuals may appropriate “the right to store water of a natural stream for later application to beneficial use.”).

29. *See* COLO. DEP’T OF NAT. RESOURCES, OFFICE OF THE STATE ENG’R, GENERAL GUIDELINES FOR SUBSTITUTE WATER SUPPLY PLANS FOR SAND AND GRAVEL PITS SUBMITTED TO THE STATE ENGINEER PURSUANT TO SB 89-120 & SB 93-260, *available at* <http://water.state.co.us/wateradmin/gravelpits.pdf> (last visited Apr. 5, 2006).

30. COLO. REV. STAT. § 37-90-103(14)(a) (2005) (“Well” means any structure or device used for the purpose or with the effect of obtaining ground water for beneficial use from an aquifer.”).

31. *Id.* § 37-90-137(11)(a)(I).

32. *Id.* § 37-92-103(10.7); *Bd. of County Comm’rs v. Park County Sportsmen’s Ranch, L.L.P.*, 45 P.3d 693, 705 (Colo. 2002) (“Construing the General Assembly’s wording and intent and effectuating evident legislative purposes, we determine that the General Assembly has authorized the issuance of decrees for artificial recharge and storage of water in an aquifer when the decree holder lawfully captures, possesses, and controls water and then places it into the aquifer for subsequent beneficial use. The applicant bears the burden of demonstrating that the aquifer is capable of being utilized for the recharge and storage of the applicant’s water without impairment to the decreed water rights of senior surface or ground water users who depend upon the aquifer for supply.”).

or underground, as a result of recharging the aquifer and storing water in it; (4) must show that the aquifer is capable of accommodating the stored water without injuring other water use rights; (5) must show that the storage will not tortiously interfere with overlying landowners' use and enjoyment of their property; (6) must not physically invade the property of another by activities such as directional drilling, or occupancy by recharge structures or extraction wells, without proceeding under the procedures for eminent domain; (7) must have the intent and ability to recapture and use the stored water; and (8) must have an accurate means for measuring and accounting for the water stored and extracted from storage in the aquifer.³³

D. The When

Under Colorado law, a water user may store water whenever the water is physically available, its water right is in-priority, and the amount of the water right has not been satisfied.³⁴ The commencement date to store water is important because it allows the water user to maximize the amount of water diverted and stored under its water right in an annual period. Generally, agricultural irrigators store water in the non-irrigation season, typically November 1 to March 31, and release the water during the irrigation season, which usually spans from April 1 to October 31, to supplement direct flow water rights.³⁵ Municipalities, however, start to fill under their storage rights when their reservoirs are at their lowest point, before the spring runoff occurs.³⁶

E. The Why

1. Surface Storage

"Colorado law favors efficient water management, optimum use, and priority administration."³⁷ Storage is a necessary component of efficient water management and optimum use. Water users capture water during wet years or periods of high flows and then either release the water later in the same year to supplement lower flows or hold it in reserve for use during periods of drought. "The fundamental function of a water storage right is to divert into storage, followed by beneficial

33. Park County Sportsmen's Ranch, 45 P.3d at 705 n.19.

34. Bd. of County Comm'rs v. Upper Gunnison River Water Conservancy Dist., 838 P.2d 840, 851 (Colo. 1992).

35. Cf. City of Thornton v. Bijou Irrigation Co., 926 P.2d 1, 27 n.12 (Colo. 1996) ("Colorado law has long recognized a distinction between the right to use the direct flow of natural waters and the right to store those waters for future use...").

36. Waage, *supra* note 11.

37. People *ex rel.* Simpson v. Highland Irrigation Co., 917 P.2d 1242, 1252 (Colo. 1996).

use at a reasonable time in the future.”³⁸ For example, Denver Water first relies on its direct flow rights to meet its demands.³⁹ As senior users call out Denver Water’s direct rights, Denver Water then exchanges reusable return flows to fulfill its demands.⁴⁰ Finally, storage normally supplies any unmet demand. Depending upon hydrology, releases from storage usually begin during the summer and continue through the year until the next spring’s runoff. Under normal water management practices, water suppliers with multiple reservoir priorities prefer to keep reservoirs with junior priorities full and release water only during persistent droughts because of the difficulty involved in recovering the fill of reservoirs with junior priorities.⁴¹

2. Underground Storage

The objective of maximizing the use of water without waste can be achieved by placing water into underground storage.

Storage of water underground in connection with conjunctive use projects has a number of advantages that implement the legislature’s purpose to maximize the beneficial use of all of the state’s waters. For example, water stored underground is not lost to evaporation; the water can be used as an emergency supply in the event of disruption to surface water systems; storing water in an aquifer raises the water table and can reduce energy demand and energy costs otherwise needed for well pumping; and storing water underground helps to reduce committing additional surface land to additional large reservoirs, conveyance systems, and stream modifications.⁴²

F. The How

Under the Colorado State Constitution, a water user may “divert the unappropriated waters of any natural stream to beneficial uses.”⁴³ Under a decreed water right, the operator of a reservoir can impound

38. *Id.* at 1251.

39. Waage, *supra* note 11.

40. An exchange is operated by introducing a substitute supply, such as reusable effluent return flows or water released from storage, in an amount equal to the amount diverted out-of-priority. An exchange involves four critical elements:

(1) the source of substitute supply must be above the calling water right; (2) the substitute supply must be equivalent in amount and of suitable quality to the downstream senior appropriator; (3) there must be available natural flow at the point of upstream diversion; and (4) the rights of others cannot be injured when implementing the exchange.

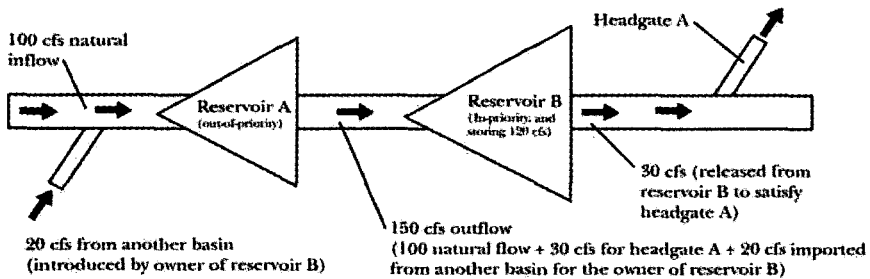
Colo. Water Conservation Bd. v. City of Central, 125 P.3d 424, 435-36 (Colo. 2005).

41. Steger, *supra* note 1.

42. Bd. of County Comm’rs v. Park County Sportsmen’s Ranch, L.L.P., 45 P.3d 693, 705 n.18.

43. COLO. CONST. art. XVI, § 6.

unappropriated water.⁴⁴ Water not available for appropriation includes water already appropriated by a more senior water right; water released from another water user's reservoir for delivery to another structure; and water imported from another watershed for delivery to a structure in the new watershed. Undelivered water is considered natural stream flow. Natural stream water derives from precipitation and snowmelt. For example, daily outflows on the upper South Platte River from reservoirs such as Spinney, Eleven Mile, and Cheesman are rarely comprised of storage water only. In the normal course of its administration of water rights in the State, the SEO must oversee water being delivered to a downstream user from an upstream source, and out-of-priority natural stream flows that pass through the reservoir prior to being impounded. On any given day, the amount of outflow from a reservoir depends upon: (1) the natural stream flow that passes through to fulfill a call on the river; (2) the water being delivered through the facility that is owned by another water user and not storable at the reservoir; and (3) the water released from the storage pool of the reservoir.⁴⁵ Exchanges into the reservoir may also affect the amount of the outflow.



In this scenario, absent transit losses, the natural inflow into Reservoir A is 100 cubic feet per second ("cfs"). The owner of Reservoir B introduces an additional twenty cfs into the stream from another water basin for delivery to Reservoir B. Reservoir A is out-of-priority. The operator of Reservoir A must pass the 120 cfs through the reservoir. Additionally, the operator of Reservoir A releases thirty cfs for delivery to Headgate A. Reservoir B is in-priority. Reservoir B can impound the 100 cfs of natural flow (200 acre-feet per day) plus the twenty cfs of foreign water (forty acre-feet per day), but must bypass the thirty cfs to be delivered to Headgate A. As illustrated, a typical reservoir release can comprise of several different types of water.

44. COLO. REV. STAT. § 37-87-101 (2005). Unless the reservoir operator stores water by exchange, then the operator can also capture waters already appropriated if a substitute supply is provided to the downstream calling water right. *See id.* § 37-80-120(2).

45. Interview with Hal Simpson, State Eng'r, Colo. Div. of Water Res., in Denver, Colo. (Oct. 14, 2005).

III. COLORADO LAW GOVERNING STORAGE

A. Constitutional Provisions

In 1935, a dispute arose over whether owners of storage rights could divert only after all direct irrigation rights were satisfied.⁴⁶ Prior to this case, the Colorado Supreme Court had held that under the 1879 Irrigation Act, owners of storage rights could only appropriate water not needed for immediate irrigation purposes.⁴⁷ In this case, the court held that article XVI, section 6 of the Colorado State Constitution required the equal treatment of direct rights and storage rights.⁴⁸ “Thus, the priority of the individual water right now controls in Colorado, whether that right is for storage or direct flow.”⁴⁹

B. Statutory Provisions

The SEO must approve plans and specifications for any dam creating a reservoir with a capacity of more than 100 acre-feet, with a surface area greater than twenty acres, or a dam height of ten vertical feet above the elevation of the natural surface of the ground.⁵⁰ State law requires owners of any reservoir to prepare and provide the SEO with tables showing the capacity of the reservoir for each foot or fraction in depth⁵¹ install and maintain a staff gauge in the reservoir capable of measuring the amount of water stored in the reservoir; install measuring devices in every stream or watercourse that discharges into the reservoir,⁵² and release from storage an amount of water equal to the evaporation losses from the reservoir.⁵³ Reservoir operators wishing to deliver stored waters must provide the division engineer or water commissioner reasonable prior notice of the time, amount, duration,

46. *People ex rel. Park Reservoir Co. v. Hinderlider*, 57 P.2d 894, 896 (Colo. 1936).

47. *Id.*

48. *Id.* at 897. The Colorado Constitution states:

The right to divert the unappropriated waters of any natural stream to beneficial uses shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose; but when the waters of any natural stream are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall have the preference over those claiming for any other purpose, and those using the waters for agricultural purposes shall have preference over those using the same for manufacturing purposes.

COLO. CONST. art. XVI, § 6.

49. *Pub. Serv. Co. v. Fed. Energy Regulatory Comm'n.*, 754 F.2d 1555, 1564 n.4 (10th Cir. 1985).

50. COLO. REV. STAT. § 37-87-105(1) (2005).

51. *Id.* § 37-84-117(1).

52. *Id.* § 37-84-117(2).

53. *Id.* § 37-84-117(5).

and point of delivery.⁵⁴ Prior to 1986, strict liability applied to reservoir operators for any damages caused by the failure of their reservoirs.⁵⁵ Now, a negligence standard applies to operators for any dam failure or reservoir overflow.⁵⁶ Further, no operator is liable for allowing the inflow to pass through its reservoir into the stream below the reservoir.⁵⁷

C. Case Law

1. One Fill Rule

In *Windsor Reservoir & Canal Co. v. Lake Supply Ditch Co.*, a dispute arose among various reservoir owners as to “whether, during the same season, and before junior reservoirs are filled once, a senior reservoir may, under our statute, have a decree allowing more than one filling on the same priority or appropriation of water for storage.”⁵⁸ The Colorado Supreme Court relied upon the Adjudication Act of 1881, and held that “each reservoir [can only] be decreed its respective priority, and this priority entitles the owner to fill the [reservoir] once during any one year, up to its capacity, and restricts the right, upon one appropriation, to a single filling for any one year.”⁵⁹ Thus, *Windsor* established the general rule that reservoirs are only entitled to one fill up to their capacity each year unless an exception to the rule applies.⁶⁰

Then, in 1936, after *People ex rel. Park Reservoir Co. v. Hinderlider*,⁶¹ State Engineer M.C. Hinderlider issued a directive to all division engineers and water commissioners that all decrees, whether for direct use or for storage purposes, must be administered strictly by their relative orders of priority.⁶² However, relying upon *Windsor*, Hinderlider determined that a reservoir is entitled to only one fill in any one year un-

54. *Id.* § 37-87-103.

55. Compare COLO. REV. STAT. § 37-87-104 (2005), with COLO. REV. STAT. § 37-87-104 (repealed and reenacted 1986); see also *Kane v. Town of Estes Park*, 786 P.2d 412, 414-15 n.3 (Colo. 1990) (noting that Colorado law governing the liability of reservoir owners changed substantially in 1986 by the repeal and reenactment of Colorado Revised Statute § 37-87-104, and the changes “included elimination of strict liability and the substitution of negligence as the basis for a claim against the owner of a water storage reservoir...”); *Sylvester v. Jerome*, 34 P. 760, 762 (Colo. 1893) (noting pre-1986 strict liability for owners of storage reservoirs for any damage).

56. COLO. REV. STAT. § 37-87-104(1) (2005).

57. *Id.* § 37-87-104(2).

58. 98 P. 729, 733 (Colo. 1908).

59. *Id.*

60. See *infra* text accompanying notes 74-79.

61. 57 P.2d 894, 896 (Colo. 1936) (holding that a reservoir owner is entitled to take and store appropriated water regardless of whether the future needs of junior direct irrigation will be satisfied).

62. Letter from M.C. Hinderlider, Colorado State Eng’r, to all Colorado div. eng’rs and water comm’rs (May 11, 1936) (on file in the Colorado Office of the State Eng’r).

til all junior rights have been satisfied.⁶³ Hinderlider adopted a “seasonal year” of November 1st to October 31st, rather than using a calendar year to define the annual period for administration and compliance with the one fill limitation.⁶⁴ The directive also established that water carried over in the reservoir after October 31st should be charged to the new seasonal year’s fill of that reservoir, which would have the effect of decreasing the effective storage capacity of the reservoir during the new seasonal year.⁶⁵ These principles still govern reservoir administration today.⁶⁶

In *Orchard City Irrigation District v. Whitten*, Orchard City Irrigation District (“OCID”) had two separate water rights from two different native sources to fill its reservoir to a capacity of 3,400 acre-feet.⁶⁷ The first decree awarded OCID a 1907 priority from Surface Creek to fill the reservoir to the capacity of 3,400 acre-feet.⁶⁸ The second water right awarded OCID a 1937 priority from Dry Creek for 2,870 acre-feet to supplement the supply from Surface Creek.⁶⁹ Both creeks were tributary to the Gunnison River.⁷⁰ The trial court determined the owner could exercise both decrees to their full extent.⁷¹ The Colorado Supreme Court disagreed, construing the 1937 decree as only an auxiliary or supplemental source to the 1907 decree to fill up to 3,400 acre-feet, and concluded that, under the facts of that case, neither decree claimed a refill or an enlargement of the original storage decree.⁷² Thus, under the “one fill rule” the second decree could only be exercised to supplement the first decree, up to the decreed capacity of 3,400 acre-feet.⁷³

2. Refill Rights

Unless a water user asks for and is granted an exception to a rule, all previously established water administration rules apply. Such is the case with refill rights. If the reservoir operator can prove that water is physically available,⁷⁴ that he needs the additional water,⁷⁵ and that he can and will use the water,⁷⁶ then the water court can adjudicate a refill

63. *Id.*

64. *Id.*

65. *Id.*

66. *See infra* text accompanying notes 136, 166-168.

67. 361 P.2d 130, 131 (Colo. 1961).

68. *Id.*

69. *Id.*

70. *Id.* at 133.

71. *Id.* at 137.

72. *Id.* at 136-37.

73. *Id.*

74. *Bd. of County Comm’rs v. United States*, 891 P.2d 952, 957, 969 (Colo. 1995).

75. *See* COLO. REV. STAT. § 37-92-103(3)(a)(II) (2005).

76: *Id.* § 37-92-305(9)(b); *see also* *Bd. of County Comm’rs*, 891 P.2d at 957.

right.⁷⁷ If the reservoir owner applied for a refill right in the original application, that refill right allows the reservoir owner to continue storing under the same priority of the original appropriation, after capacity becomes available and the reservoir has achieved its first fill.⁷⁸ Further, a reservoir operator can refill the reservoir under a junior priority if all other legal requirements are satisfied.⁷⁹

IV. THE ROLE OF THE WATER COURT

A water court can confirm that water users have appropriated and put waters of the state to beneficial use under a priority.⁸⁰ An adjudicated water right allows the SEO to administer the water right under the priority system in accordance with the terms of the decree.⁸¹

A. Adjudicating a Storage Water Right

The requirements to adjudicate a storage water right are the same as any other water right. The water user must file an application with the water clerk,⁸² normally in the water division where water will be diverted or stored under the water right.⁸³ The applicant must identify the scope and extent of the water right sought.⁸⁴ To establish a water storage right, the Colorado Water Courts require, at a minimum, the following information: (1) identity of the applicant, (2) name of the reservoir, (3) location of the reservoir, (4) source of water (stream, tributary, river, or well), (5) date of appropriation, (6) amount claimed, (7) use of water, (8) surface area of high water line, (9) total capacity, (10) height of dam, (11) length of dam, and (12) the name(s) of the owner(s) of land upon which the reservoir will be lo-

77. See *City of Thornton v. Bijou Irrigation Co.*, 926 P.2d 1, 31 (Colo. 1996).

78. See *City of Grand Junction v. City & County of Denver*, 960 P.2d 675, 677 (Colo. 1998).

79. See *id.* at 684; see also *Aspen Wilderness Workshop, Inc. v. Hines Highlands L.P.*, 929 P.2d 718, 724 (Colo. 1996).

80. "A water court decree adjudicating a right [to waters of a natural stream] confirms the existence of that right which arose initially by application of water to beneficial use." *Bayou Land Co. v. Talley*, 924 P.2d 136, 149 (Colo. 1996).

81. COLO. REV. STAT. § 37-92-301(3) (2005); see also *Empire Lodge Homeowners' Ass'n v. Moyer*, 39 P.3d 1139, 1148-49 (Colo. 2001) ("The reason for adjudicating a water right is to realize the value and expectations that enforcement through administration of the right's priority secures.").

82. COLO. REV. STAT. § 37-92-302(1)(a) (2005).

83. *Id.* § 37-92-304(4) ("[T]he hearing shall be conducted by the water judge in the district court of the county in which is located the point of diversion of the water right or conditional water right involved"). *But see* *Dep't of Natural Res. Div. of Wildlife v. Ogburn*, 570 P.2d 4, 5 (Colo. 1977) (noting that the water court in the district where the water will be used, if different from the district where diverted or stored, may be a more appropriate venue).

84. COLO. REV. STAT. § 37-92-302(2)(a) (2005).

cated.⁸⁵ The appropriation date is based upon actual exercise and use of the water right, and for conditional water rights “when overt acts coalesce to openly demonstrate the applicant's intent to appropriate the water for a beneficial use”⁸⁶

After an applicant provides notice, the applicant must strictly prove the requirements to establish a water right.⁸⁷ In addition to providing information regarding the scope and extent of the water right, an applicant must demonstrate a need for the water,⁸⁸ that there is water physically and legally available to appropriate,⁸⁹ that the project is feasible,⁹⁰ that the applicant is capable of financing the project,⁹¹ that the applicant has the ability to secure real property interests,⁹² and that there are no absolute bars to the project.⁹³

Most water storage applicants receive conditional decrees for a water right⁹⁴ because they need to know where their right is in the priority system and how much water is available under their water right, before they begin spending money on construction. As long as the owner of the storage right makes diligent efforts to develop the conditional right in light of all facts and circumstances, the absolute decreed date will relate back to the date of the conditional decree.⁹⁵

85. See COLO. WATER COURTS, APPLICATION FOR WATER STORAGE RIGHT, available at <http://www.courts.state.co.us/chs/court/forms/waterforms/jdf297w.doc> (last visited Apr. 25, 2006).

86. *Vought v. Stucker Mesa Domestic Pipeline Co.*, 76 P.3d 906, 912 (Colo. 2003).

87. See *Shirola v. Turkey Canon Ranch, L.L.C.*, 937 P.2d 739, 747 (Colo.1997) (“[S]ection 37-92-302(1)(b) . . . allows ‘any person’ to file a statement of opposition and to hold the applicant for water rights to a standard of ‘strict proof.’”). However, in water cases, as in civil cases, the standard of proof is a preponderance of evidence. COLO. REV. STAT. § 13-25-127(1) (2005); see also *Colo. Water Conservation Bd. v. Upper Gunnison River Water Conservancy Dist.*, 109 P.3d 585, 597 (Colo. 2005).

88. See COLO. REV. STAT. § 37-92-103(3) (a) (II) (2005).

89. *Bd. of County Comm’rs v. United States*, 891 P.2d 952, 957 (Colo. 1995). Frequency of water availability should not be as important as in the case of a direct flow right due to the nature of storage – a reservoir is designed to capture water during wet years or periods of high flows for use during periods of low flow.

90. *N. Colo. Water Conservancy Dist. v. OXY USA, Inc.*, 990 P.2d 701, 707-08 (Colo. 1999); *N. Colo. Water Conservancy Dist. v. Chevron Shale Oil Co.*, 986 P.2d 918, 921 (Colo. 1999).

91. *Pub. Serv. Co. of Colo. v. Blue River Irrigation Co.*, 753 P.2d 737, 742 (Colo. 1988).

92. *FWS Land & Cattle Co. v. Div. of Wildlife*, 795 P.2d 837, 840 (Colo. 1990).

93. An applicant’s ability to secure applicable federal, state, or local permits is considered a factor and not an element of securing a water right. COLO. REV. STAT. § 37-92-301(4)(c).

94. A conditional water right means “a right to perfect a water right with a certain priority upon the completion with reasonable diligence of the appropriation upon which such water right is to be based.” COLO. REV. STAT. § 37-92-103(6).

95. *City & County of Denver v. N. Colo. Water Conservancy Dist.*, 276 P.2d 992, 999 (Colo. 1954).

B. Making a Conditional Storage Right Absolute

Once a reservoir owner completes construction of the reservoir, stores water, and subsequently puts the water to beneficial use as permitted under the decree, the owner can apply to the water court to make the conditional water right absolute as part of a diligence proceeding or by a separate application.⁹⁶ Making a water right absolute “perfects” or “vests” the conditional water right, the priority relates back to the original appropriation and adjudication,⁹⁷ and the owner no longer needs to show diligence on the amount made absolute.⁹⁸ As mentioned previously, Colorado does not consider mere storage of water a beneficial use.⁹⁹ Thus, the owner of the conditional storage right must strictly prove that he or she released water from storage and put it to beneficial use in accordance with the terms of the decree.

There is no requirement that a water user must use stored water stored within that year.¹⁰⁰ Such a requirement would run contrary to common sense because it would eliminate the functionality of storage. Nevertheless, water right holders litigated this issue in Colorado in a 1944 dispute that arose over the “one fill rule” and making water stored in previous years absolute.¹⁰¹ The question that the court addressed was whether, in making a conditional water right absolute, a reservoir owner can take credit for water stored in previous years when the beneficial use came after the year in which it was stored.¹⁰² The Colorado Supreme Court concluded that a reservoir owner need not release waters stored under a reservoir priority in the same storage season to make the right absolute.¹⁰³

For example, in 1972, Denver Water applied to make absolute the entire amount of water stored in the Dillon Reservoir based on evidence that Denver Water captured and would ultimately put the water

96. *See, e.g.*, *Upper Gunnison River Water Conservancy Dist. v. Bd. of County Comm'rs*, 841 P.2d 1061, 1065 (Colo. 1992).

97. “[T]he priority of a water right is a function of the calendar year in which the adjudicated application for conditional decree was filed in the water court and the appropriation date, which is the date on which the first step towards the appropriation was taken.” *Dallas Creek Water Co. v. Huey*, 933 P.2d 27, 35 (Colo. 1997).

98. *Shirola v. Turkey Canon Ranch, L.L.C.*, 937 P.2d 739, 748 (Colo. 1997) (“[O]nce an appropriation is completed with reasonable diligence through the application of water to beneficial use, the appropriator’s water right vests.”).

99. *See supra* text accompanying note 17. The exception to this general rule may be where the applicant claimed and the court specifically adjudicated storage as a beneficial use in the decree. *See, e.g.*, *Bd. of County Comm'rs v. Crystal Creek Homeowners’ Ass’n*, 14 P.3d 325, 336 (Colo. 2000).

100. *N. Sterling Irrigation Dist. v. Riverside Reservoir & Land Co.*, 200 P.2d 933, 935 (Colo. 1948).

101. *Id.*

102. *Id.*

103. *Id.*

to beneficial use within Denver Water's service area.¹⁰⁴ The United States District Court denied Denver Water's application, and held that storage of water prior to utilization in the Denver area was not itself a beneficial use entitling Denver Water to an absolute decree.¹⁰⁵ In 1977, Denver Water again applied to make absolute the entire decreed capacity of Dillon Reservoir.¹⁰⁶ This time, Denver Water demonstrated, through evidence of its accounting records and testimony of the reservoir and treatment plant operators, that it had stored and released over 252,000 acre-feet of water in Dillon Reservoir through the Roberts Tunnel to its treatment plants.¹⁰⁷ Relying upon *North Sterling*,¹⁰⁸ the court found that Denver Water had, in the past, filled Dillon Reservoir in excess of its decreed capacity and that, from time to time, Denver Water had released water from storage and placed it to beneficial use.¹⁰⁹ Based on this finding, the court made absolute the entire amount decreed to Dillon Reservoir.¹¹⁰

C. Scope of an Absolute Water Storage Right

An absolute water right is "a right to use in accordance with its priority a certain portion of the water of the state by reason of the appropriation of the same."¹¹¹ By making a water right absolute, a water court confirms that the applicant: (1) captured, possessed, and controlled water, and (2) applied the water to a beneficial use in accordance with its decree.¹¹² Thus, an absolute decree should preclude subsequent claims that the water user did not divert, store, or use the water in accordance with the terms of the decree.¹¹³ However, claim preclusion may not apply if the owner of the water right later claims a different use was made absolute than what was originally claimed.¹¹⁴

104. *United States v. N. Colo. Water Conservancy Dist.*, No. 73-1300, slip op. at 3 (10th Cir. Nov. 28, 1973).

105. *United States v. N. Colo. Water Conservancy Dist.*, Nos. 2782, 5016, 5017, slip op. at 5-6 (D. Colo. January 9, 1973).

106. *Application of the City and County of Denver*, Case No. W-741-77 (Colo. Water Div. 5 Dec. 28, 1977).

107. *In re Application of the City and County of Denver*, Case No. W-741-77, slip op. at 3 (D. Colo. Sept. 15, 1978).

108. 200 P.2d 933 (Colo. 1948).

109. *In re Application of the City and County of Denver*, Case No. W-741-77, slip op. at 3 (D. Colo. Sept. 15, 1978).

110. *Id.* at 4.

111. COLO. REV. STAT. § 37-92-103(12) (2005).

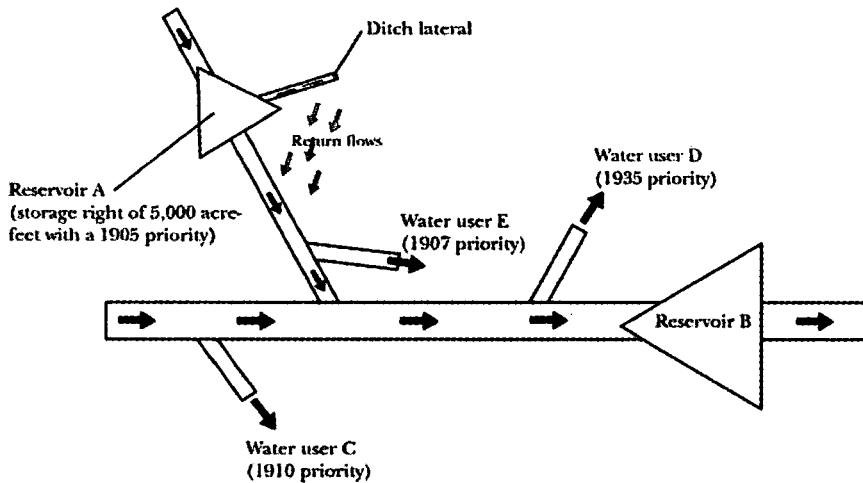
112. *See City of Lafayette v. New Anderson Ditch Co.*, 962 P.2d 955, 961 (Colo. 1998).

113. *See Williams v. Midway Ranches Prop. Owners Ass'n*, 938 P.2d 515, 523 n.5 (Colo. 1997); *Se. Colo. Water Conservancy Dist. v. Rich*, 625 P.2d 977, 979 (Colo. 1981).

114. *See Farmers High Line Canal & Reservoir Co. v. City of Golden*, 975 P.2d 189, 203 (Colo. 1999) ("[C]laim preclusion does not bar the water court from addressing

D. Changing a Water Storage Right

A water user may seek to change a water storage right to another type, time, and place of use or location of storage; to alternate places of storage, from a direct flow water right to a storage right; or any combination of the above.¹¹⁵ To do so, however, the water user must demonstrate that the change will not injure the owner of, or persons entitled to use, water under a vested water right or a decreed conditional water right.¹¹⁶ A change of water right “includes changes of conditional water rights as well as changes of water rights.”¹¹⁷



In this scenario, owner of Reservoir A wishes to change his or her storage right of 5,000 acre-feet with a 1905 priority, historically used for irrigation, to Reservoir B, which has a capacity of 50,000 acre-feet for municipal purposes. Reservoir A also has a conditional enlargement decree for 3,000 acre-feet with a 1940 priority that the owner also wishes to change to Reservoir B for municipal purposes. Reservoir A’s storage water right may be changed to a new place of storage, in this case Reservoir B, provided the amount of water contemplated for the change is legally and physically available to Reservoir A and that other vested water rights or conditionally decreed water rights are not injured (water users C, D, and E).

A change of a storage right differs from a change of a direct flow water right. Unlike direct flow water rights that divert, use, and return water in a fairly consistent and timely manner, storage rights supple-

circumstances which have changed subsequent to the previous decree proceedings and which have not been litigated.”)

115. COLO. REV. STAT. § 37-92-103(5) (2005).

116. *Id.* § 37-92-305(3).

117. *Id.* § 37-92-103(5).

ment direct rights and, thus, may release, use, and return water in an intermittent manner depending upon hydrologic circumstances. In *City of Westminster v. Church*, the Colorado Supreme Court held that a change in a storage right is not limited to amounts historically diverted because, in any given year, the storage right could be exercised to its full extent depending upon the hydrologic circumstances.¹¹⁸

For example, if a water user had a direct flow ditch decree and capacity for ten cfs, the water user could theoretically divert 3,600 acre-feet (ten cfs times two acre-feet per cfs per day times 180 days in the irrigation season).¹¹⁹ However, if the SEO's diversion records depict that the water user only historically diverted 1,200 acre-feet in-priority during the irrigation season, the direct flow water user would be limited after the change to his historic diversions and duty of water.¹²⁰ Thus, the 1,200 acre-feet historically diverted would be allocated between crop consumptive use and return flows, both of which would include terms and conditions limiting future diversions and return flows to mimic historic patterns and uses. In contrast, if a water user had, at one time, physically stored 3,600 acre-feet, but had recently diverted only 1,200 acre-feet per year, the water user would still be able to change the full decreed amount because the water user could potentially store up to 3,600 acre-feet of water in any given year depending upon the hydrologic circumstances.

It is appropriate, however, for water courts to place terms and conditions in a decree replicating the historic return flows from the use of in-basin water released from storage in order to avoid injury to downstream appropriators.¹²¹ Returning to the previous example, the irrigators under Reservoir A historically consumed fifty percent of the water released from storage, and fifty percent returned to the stream above Water User E. Thus, the changed use at Reservoir B may be limited to fifty percent of the amount released from storage at Reservoir A, and Reservoir A may need to reserve water for historic returns to prevent injury to Water User E. Assessing the potential injury may prove diffi-

118. 445 P.2d 52, 58 (Colo. 1968).

119. This example assumes the water right was in-priority the entire irrigation season.

120. Duty of water is defined as:

that measure of water, which, by careful management and use, without waste, is reasonably required to be applied to any given tract of land for such period of time as may be adequate to produce therefrom a maximum amount of such crops as ordinarily are grown thereon. It is not a hard and fast unit of measurement, but is variable according to conditions.

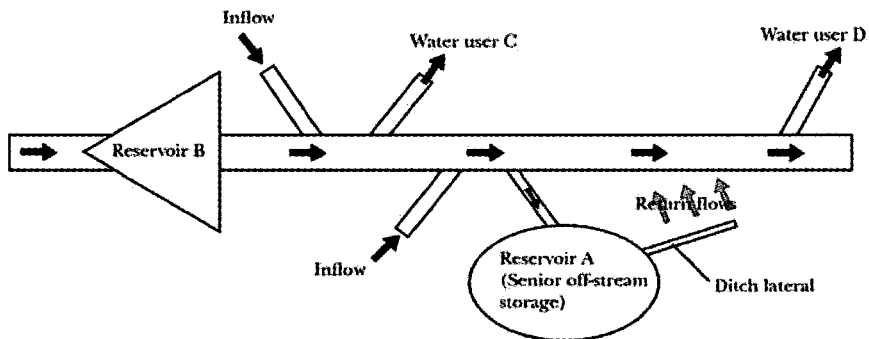
Farmers Highline Canal & Reservoir Co. v. City of Golden, 272 P.2d 629, 634 (Colo. 1954).

121. See, e.g., *Se. Colo. Water Conservancy Dist. v. Fort Lyon Canal Co.*, 720 P.2d 133, 146-47 (Colo. 1986) ("The 1969 Water Rights Act and our recent cases make very clear that diminished return flows, whether due to change in direct-flow or storage rights, must be considered when calculating the amount of injury to other appropriators.").

cult when water storage releases and return flows are intertwined. For example, return flows from use of the released water fluctuate in time and amount depending not upon when and how much water a water user diverted in-priority, but upon when and how much water the operator released from storage to supplement its direct rights.

Additionally, the water user cannot take advantage of increased water availability at the new location. Rather, the water user is only entitled to the amount of water physically and legally available at the original place of storage. Otherwise, the change creates a burden on the stream that did not exist when water users C and D made their appropriations. The changed water right cannot call other water rights that would not otherwise be called from the original location. Thus, terms and conditions of the change commonly include the administration of the changed water right from a gauge at the original location of storage.

A water right owner may transfer a conditional enlargement decree to a new place of storage so long as the owner provides proof of no injury to other water users or proposes terms and conditions to prevent injury to other water users.¹²²



In this example, a water user wishes to change a senior downstream off-stream storage right at Reservoir A to upstream Reservoir B. The same rules apply to this change – no injury to vested or conditionally decreed water rights can occur as a result of the change.¹²³ Here, however, the downstream location benefited from tributary inflow below the upstream location. The water user of right A could injure water user C by moving the storage right upstream. Thus, a water court may reduce the storable amount at the changed location by the amount of intervening flow, if Reservoir A relied upon intervening tributary in-

122. See *City of Thornton v. Clear Creek Water Users Alliance*, 859 P.2d 1348, 1358 (Colo. 1993).

123. COLO. REV. STAT. § 37-92-305(3) (2005).

flow to fill. Water user D is also entitled to terms and conditions necessary to maintain return flows from the use of in-basin water released from storage at Reservoir A.

V. THE ROLE OF THE STATE ENGINEER

A. Administration

The governor appoints a state engineer, who is in charge of the Division of Water Resources.¹²⁴ The state engineer appoints division engineers who, in turn, hire water commissioners,¹²⁵ all of whom perform the functions of the office, including the administration and distribution of the waters of the state.¹²⁶ The SEO must adhere to the priorities for water rights and conditional water rights as established by decrees entered in adjudications under the 1969 Water Right Determination and Administration Act,¹²⁷ earlier adjudication acts,¹²⁸ interstate compacts,¹²⁹ and any other authority that the General Assembly delegates to the office. "In times of short supply, water users depend on the State Engineer to curtail undecreed uses and decreed junior uses in favor of decreed senior uses."¹³⁰ As such, the SEO must determine when a water user can or cannot exercise a storage priority.¹³¹ The General Assembly authorized the SEO to order the release of any water that had been illegally or improperly stored to enable the owner of the water rights to use that water.¹³² The General Assembly has further authorized the SEO to order any owner or user of a water right to measure diversions and report those measurements at reasonable times, as well as maintain a safe storage level.¹³³ Under the foregoing authority, the SEO has developed certain administrative rules, policies, or guidelines related to the storage of water.

124. *Id.* §§ 37-80-101, -102(1)

125. *Id.* §§ 37-92-202(1)(a), -202(3).

126. *Id.* § 37-92-301(1).

127. *Id.* § 37-92-301(3).

128. *Id.* § 37-92-301(3); *see, e.g.*, Act of Feb. 19, 1879, sec. 18, 1879 Colo. Sess. Laws 94, 99; Act of Apr. 11, 1903, ch. 130, sec. 4, 1903 Colo. Sess. Laws 297, 298.

129. COLO. REV. STAT. § 37-80-102(1)(a).

130. *Empire Lodge Homeowners' Ass'n v. Moyer*, 39 P.3d 1139, 1149 (Colo. 2001).

131. Each division engineer shall order the total or partial discontinuance of any diversion in his division to the extent that the water being diverted is not necessary for application to a beneficial use; and he shall also order the total or partial discontinuance of any diversion in his division to the extent that the water being diverted is required by persons entitled to use water under water rights having senior priorities, but no such discontinuance shall be ordered unless the diversion is causing or will cause material injury to such water rights having senior priorities.

COLO. REV. STAT. § 37-92-502(2)(a).

132. *Id.* § 37-92-502(3).

133. *Id.* § 37-92-502(5)(a); § 37-87-107.

B. Carry-Over Storage

Carry-over storage is water stored in previous years that is still in storage at the beginning of the water year.¹³⁴ The SEO counts carryover storage toward the fill of the reservoir in the ensuing water year. For example, if a reservoir's decreed and physical capacity was 120,000 acre-feet and at the end of the water year it contained 50,000 acre-feet of water stored in previous year(s), then the SEO would carry over the 50,000 acre-feet to the new water year and limit the amount the owner could divert and store in the new water year to 70,000 acre-feet, even if the water user released water from storage during that new year.

C. Storable Inflow

"Storable inflow" means water that is physically and legally available to store under the storage priority.¹³⁵ When water that a water user could impound or control under the storage priority is bypassed through a reservoir, the SEO will still count that water towards the fill under the decree, even though the water user did not physically store the water. Upon prior notification and approval by the relevant division engineer, a water user may be able to obtain an exception from the general rule that bypassed storable inflow counts toward the paper fill. Such exceptions include physical constraints such as winter icing, which prevents the reservoir operator from impounding and controlling the inflow, or poor water quality that the reservoir operator considers unsuitable for normal use.

The accounting principle of storable inflow assures junior water right users the ability to use water in the amount and time that they could have stored, had the senior storage right filled with water available to it under its storage water right's priority. The reservoir owner must assess the runoff conditions prior to bypassing storable inflow because storage rights cannot bypass storable inflow to the detriment of junior water rights.

For example, if a reservoir operator with a decree to store 20,000 acre-feet of water bypassed 5,000 acre-feet of water that they would otherwise have been able to store in-priority, the SEO considers the bypassed water storable and would credit the bypassed water toward the fill of the reservoir. Thus, the reservoir would achieve a paper fill even though the reservoir only physically contains 15,000 acre-feet of water. If a reservoir operator provides temporary flood control protection by bypassing storable inflow, the reservoir owner risks not being

134. See *supra* text accompanying notes 37-38.

135. The SEO, however, does not consider water bypassed through a reservoir due to a permit condition storable because the water is not legally available to be stored. Simpson, *supra* note 45.

able to physically fill when either a senior or junior water user places a call on the river. Indeed, this is what happened in *City of Grand Junction v. City and County of Denver*, where Denver Water filed for a refill right that would allow it to bypass storable water, yet capture water under a new refill priority so that the reservoir could physically fill.¹³⁶

D. Paper Fill

A reservoir operator has achieved a “paper fill” when carry-over storage plus storable inflow equals the decreed amount of the storage water right or the physical capacity of the reservoir, whichever is less. Even if there is capacity to store, the SEO will not allow the reservoir operator to continue to store water beyond the paper fill, unless there is a free river condition or the reservoir has supplemental storage rights such as a refill right.¹³⁷ Thus, a storage water right could be fully satisfied, but the reservoir may not be physically full.

E. Upstream Storage Statute

In 1969, the General Assembly codified the longstanding practice of the SEO to permit upstream junior reservoirs to store water before downstream senior reservoirs had filled.¹³⁸ In Senate Bill 105, in a section originally titled “Conservation by high storage,” the state “con-

136. 960 P.2d 675, 677 (Colo. 1998). Denver Water had evacuated space and bypassed inflow for flood control purposes. The SEO decided this was storable inflow and should be counted toward the reservoir’s fill, thus leaving Denver Water in the predicament that its reservoir may not physically fill if a call came on the river. *Id.*

137. “‘Free river conditions’ occur when there is sufficient natural supply to satisfy all water uses, whether decreed or undecreed, and State Engineer administration is unnecessary for the protection of decreed water rights.” *Empire Lodge Homeowners’ Ass’n v. Moyer*, 39 P.3d 1139, 1149 n.14 (Colo. 2001). Water users may divert beyond the measure of their decrees during free river conditions because the diversion and storage does not infringe upon the rights of other water users. *City of Westminster v. Church*, 445 P.2d 52, 59 (Colo. 1968).

138. Act of June 7, 1969, ch. 370, sec. 8, 1969 Sess. Laws 1196.

In every case in which the state engineer finds that water can be stored out of priority under circumstances such that the water so stored can be promptly made available to downstream senior storage appropriators in case they are unable to completely store their entire appropriative right due to insufficient water supply, the state engineer may permit such upstream storage out of priority, but such storage water shall be promptly released on demand of a downstream senior whenever needed by such senior for actual use.

COLO. REV. STAT. § 37-80-120(1) (2005). As early as 1924, State Engineer Hinderlider allowed upstream river reservoirs to fill “as early as possible and depend, to some extent, on the return flow to complete the filling of the reservoirs farther down the river.” Letter from M.C.Hinderlider, State Engineer, to W.B. Gaumer, President, Farmers Reservoir & Irrigation Co. (November 17, 1924) (on file in the Office of the State Engineer). The practice on the South Platte of allowing upstream reservoirs to fill before senior downstream reservoirs has sometimes been referred to as the “Gentlemen’s Agreement.”

serves" water by keeping water in storage higher up in the watershed and relying on intervening inflow and return flows to fill downstream senior reservoirs.¹³⁹ If the downstream senior storage right fills, then the upstream junior can keep the water. However, if any downstream senior water user demands water for actual use, then the upstream junior can no longer store the inflow, and must promptly release any water stored out-of-priority upon demand of the unsatisfied downstream senior reservoir.

Interesting administration issues arise when a downstream water user demanding water is senior to the upstream junior storage right, yet junior to the senior storage right. If the downstream call is below the senior reservoir should the water storable by the upstream reservoir be bypassed through the senior reservoir to the downstream water user demanding the water or does the water being bypassed count against the paper fill of the senior storage right? Further, can water rights with intervening priorities be impacted if the downstream senior storage right does not fill as fast as it could have without the upstream junior storing water?

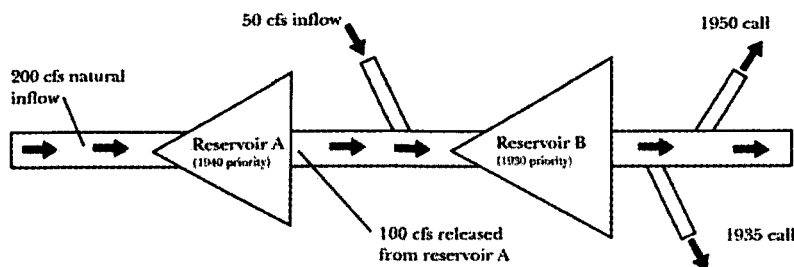
Currently, the SEO administers upstream out-of-priority depletions, including storage, toward the paper fill of the downstream senior storage right.¹⁴⁰ Once the downstream senior storage right achieves a paper fill, its storage right has been satisfied. The SEO, however, will allow the downstream senior reservoir to continue to store until it physically fills or a call originates below the downstream reservoir. The SEO has also allowed the downstream storage reservoir to store under the next junior storage right in the basin until it is physically full or a call comes on the river senior to the next junior storage priority.¹⁴¹ This offsets the amount of water the upstream junior would have to release to pay back the downstream senior if it did not fill from the intervening inflow. Indeed, an administrative scenario that would require the upstream junior to release all water stored out-of-priority whenever the downstream senior reservoir achieved its paper fill would be contrary to the original purpose of conserving water high in the watershed.¹⁴²

139. Ted Gill, Chairman Senate Agriculture Committee, draft of Senate Bill No. 105 (1969) (unpublished draft of bill from bill sponsor's member file, on file with the Colorado State Archives).

140. Reservoir administration can deviate from division to division depending upon the provisions of the decrees and hydrologic circumstances within the divisions. Waage, *supra* note 11.

141. Simpson, *supra* note 45.

142. According to an observer associated with one of the drafters of S.B. 105, at the time of the enactment of S.B. 105, the concept of paper fill was unknown. He considers the administration of the upstream storage statute by use of the paper fill mechanism to be an oxymoron. Interview with Jack Ross, Water Attorney, Dufford and Brown, in Denver, Colo. (Dec. 30, 2005).



In this scenario, Reservoir A has an unsatisfied 1940 priority and Reservoir B has an unsatisfied 1930 priority. Administratively, the SEO may allow Reservoir A to store the inflow, 100 cfs, out-of-priority under the upstream storage statute. If Reservoir B physically fills with the inflow from Reservoir A before a call comes on the river, then Reservoir A can keep the water that it diverted out-of-priority. Under the SEO's administration, however, Reservoir B achieves its paper fill when the total of the amount carried over in Reservoir B, plus the amount stored out-of-priority in Reservoir A, plus the amount of storable inflow to Reservoir B equals the decreed or physical capacity of Reservoir B.

However, if any water right user downstream of Reservoir B placed a call on the river and Reservoir B had reached a paper fill, Reservoir B must bypass all inflow and will not physically fill. This applies even if the calling right is junior to the storage right, in this example the 1950 right. Accordingly, Reservoir B could demand that Reservoir A release the water stored out-of-priority necessary for it to physically fill. Under the upstream storage statute, the SEO will allow Reservoir B to continue to store under the next junior water right in the basin, until it physically fills, even if it has already achieved a paper fill, as long as that next junior priority is senior to the calling right. In this case, Reservoir B would store under Reservoir A's priority, since the 1950 water right is junior to Reservoir A's priority. Allowing Reservoir B to continue to store under the more junior priority of Reservoir A reduces the amount Reservoir A must pay back to Reservoir B.

F. Reporting Measurements

Each reservoir operator must measure the amount of water stored in a reservoir.¹⁴³ However, the SEO has the discretion to determine a reasonable time for the water user to report the measurement.¹⁴⁴ Most operators of large reservoirs record daily changes in elevations that show changes in storage from the previous twenty-four hour period. The frequency of data collection or reporting for some reservoirs may

143. COLO. REV. STAT. § 37-84-117(2) (2005).

144. *Id.* § 37-92-502(5)(a).

change because of the time of year and the requirements of the water commissioner or division engineer.

G. Computed Inflow

A reservoir operator can (1) measure the amount stored by gauging the inflow to and outflow from a reservoir; or (2) calculate the amount stored from the change in lake elevation as measured on a staff gauge located in the reservoir. Under the latter method, reservoir operators can then determine actual inflow and outflow to the reservoir by measuring change in elevation over the same period of time and then accounting for net surface water evaporative losses.¹⁴⁵ Operators of large reservoirs often use computed inflow because it accounts for all tributary inflow including underflow, unmeasured tributaries, and precipitation on the reservoir's surface.¹⁴⁶

H. Administrative Accounts

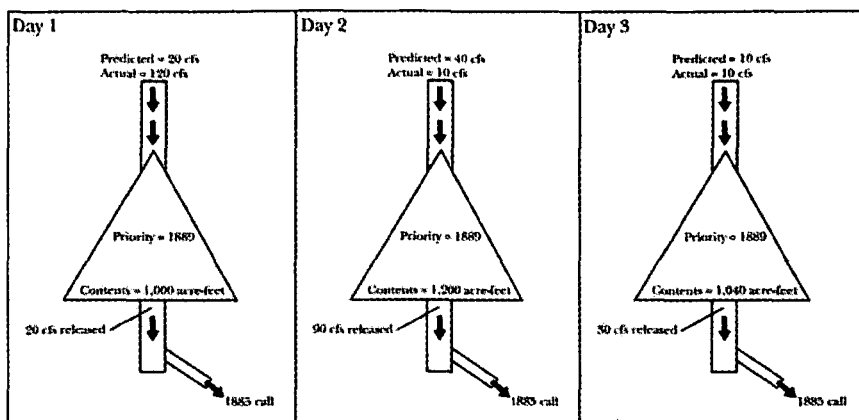
While reservoir operators can reasonably predict the amount of water released from an on-stream reservoir, the amount of water that flows into that same reservoir is largely beyond their predictive capabilities because the flows can vary greatly from day to day. While variances may occur because of inaccuracies in capacity tables or errors in reading lake level gauges, most variances are largely due to daily variations of the weather. Warm weather in the spring or a summer thunderstorm can increase runoff and evaporation; while a series of cool cloudy days in the spring will lower runoff or decrease evaporation. Large reservoir operators normally track the cumulative amount of water over-stored or under-stored in an administrative account. The administrative account, also known as the owe-the-river or owe-the-reservoir account, tracks the amount of over-storage, if positive, or under-storage, if negative, on any given day.¹⁴⁷ For large on-stream reservoirs in over appropriated basins, administration accounts track short-term surges or drops in inflow and over or under releases of stored water so that the reservoir operator can promptly release over-storage to the river or recoup under-storage.¹⁴⁸

145. See *infra* text accompanying notes 150-157.

146. Simpson, *supra* note 45.

147. Over-storing means that the reservoir operator over predicted inflow and inadvertently stored water out-of-priority. The accounting will show a positive entry in the Administrative Account. Under-storing means a reservoir operator under predicted inflow and inadvertently released too much water from storage. Steger, *supra* note 1.

148. Simpson, *supra* note 45.



Here, the scenario assumes an 1885 call on the river, and an 1889 priority for the reservoir. Thus, the reservoir is out-of-priority to store the natural inflow. On day one, the reservoir operator sets the outflow at 8:00 am at twenty cfs to pass on the expected inflow of twenty cfs. Due to an unexpected rainstorm, however, the average inflow increased to 120 cfs. Thus, at the beginning of day two, the elevation gauge showed an increase in storage of 200 acre-feet ($120 \text{ cfs} - 20 \text{ cfs} \times 2 \text{ AF/cfs/day}$). Because the water was stored out-of-priority, the reservoir operator enters this amount in the administrative account as water "owed to the river." The reservoir operator must release the water back to the river within a reasonable time, usually within 24 to 72 hours. Over the next few days, if inflow remains constant, the reservoir operator will increase the outflow from the reservoir to release the inadvertently stored out-of-priority water.¹⁴⁹

Continuing with the example, on day two, the call on the river is still 1885 and the reservoir remains out-of-priority. The reservoir operator sets the outflow gate at 90 cfs to pass 50 cfs of the out-of-priority stored water plus 40 cfs of expected inflow. During the day, however, the average inflow drops to 10 cfs, so the change in storage on day two is a decrease of 160 acre-feet ($90 \text{ cfs} - 10 \text{ cfs} \times 2 \text{ AF/cfs/day}$). Starting day three, the reservoir operator still has positive 40 acre-feet in the owe-the-river account. To set the outflow for day three, the operator will again assume a rate of inflow and adjust the outflow to pass the remaining water in the administrative account. On day three, if the average inflow remained at the predicted level of 10 cfs, an outflow setting of 30 cfs would return the administrative account back to zero by the end of day three.

149. Another method to reduce the administrative account is to operate an exchange. For example, if a reservoir stored water out-of-priority, the owner could operate an exchange using reusable effluent return flows as a substitute supply. Thus, by introducing a substitute flow, the reservoir operator would not owe the water to the river.

I. Evaporation Losses

When an on-stream reservoir is constructed, it expands the surface area of the stream from which it impounds water. Thus, a reservoir causes an increase in evaporation losses that deplete the stream. When a reservoir is in-priority and the reservoir suffers evaporation loss, the operator does not have to pay back the stream for that loss. However, the General Assembly requires the SEO to assess evaporation losses when the on-stream reservoir is out-of-priority, and requires the operator to release stored water to offset the amount of evaporation losses.¹⁵⁰ The computed inflow determination understates actual inflow by the amount of evaporation. Therefore, when a reservoir is out-of-priority, the owner must drawdown the reservoir by the amount of evaporation to prevent out-of-priority storage.¹⁵¹

For on-stream reservoirs, the SEO is directed to “compute the surface evaporation from the reservoir and deduct therefrom any accretions to the stream flow resulting from the existence of the reservoir and any natural depletions to the stream flow which would have resulted if the reservoir were not in existence.”¹⁵² Essentially, the General Assembly gives on-stream reservoir owners the right to reduce their required evaporation releases by claiming credit for precipitation that native vegetation consumes. The rationale behind allowing a precipitation credit is that prior to the reservoir construction a portion of the precipitation that fell over the now inundated area was consumed by native vegetation or evaporated from existing water surfaces. Therefore, construction of the reservoir decreased the amount of precipitation consumed and the reservoir owner is entitled to claim a credit for the reduction.

The difference between gross evaporation and precipitation that falls on the surface of the reservoir is “net reservoir evaporation.”¹⁵³ The SEO requires on-stream reservoir owners to account for and release only the net evaporation loss from the storage facility when it is out-of-priority and not ice covered. The amount of water a reservoir operator must release is the net evaporation in inches multiplied by the surface area of the reservoir in acres, divided by twelve to convert to acre-feet.

150. COLO. REV. STAT. § 37-84-117(5) (2005).

151. A refill decree allows a reservoir operator to keep the reservoir full without a drawdown for evaporation losses, provided the refill right remains in-priority. *See supra* text accompanying notes 74-79.

152. COLO. REV. STAT. § 37-84-117(5).

153. Net reservoir evaporation is defined as “[t]he evaporative water loss from a reservoir after making allowance for precipitation on the reservoir. Net reservoir evaporation equals the total evaporation minus the precipitation on the reservoir surface.” N.M. Office of the State Eng’r, Glossary: Frequently Used Water Terms & Definitions, http://www.ose.state.nm.us/water_info_glossary.html (last visited March 9, 2006).

J. Reservoir Seepage

When in-basin water seeps from a reservoir and becomes part of the stream it belongs to other appropriators in the order of their priorities.¹⁵⁴ The reservoir owner that has lost dominion and control cannot recapture seepage from in-basin sources absent a separate water right and decree to do so. However, the rule against recapture does not apply to water imported from another basin that seeps from a reservoir, or water that seeps into an underground aquifer.¹⁵⁵ Further, an appropriator of seepage water cannot require or demand that the seepage continue; the reservoir owner may make improvements that eliminate or reduce the seepage.¹⁵⁶ Unless otherwise required by decree, or under unique circumstances where the operator may collect and place seepage to beneficial use, the SEO does not assess seepage losses toward the paper fill of the reservoir's storage right.¹⁵⁷

K. Transit Losses

The General Assembly requires the state engineer to charge transit losses for the delivery of water released from storage.¹⁵⁸ Transit losses are losses to the stream due to seepage, stream evaporation, or plant consumption. Transit losses vary by stream depending upon channel size, elevation, stream gradient, vegetation, bank storage, time of year, location, distance, and other factors.¹⁵⁹ For example, stream losses may exceed 0.15% per mile in the upper reaches of the South Platte River and 0.5% per mile in the lower reaches due to channel characteristics.¹⁶⁰

The SEO also charges transit losses in plans for augmentation and exchanges when water is released to the senior downstream call. The SEO will reduce the amount of water that the water user can divert out-of-priority by the amount lost in transit, meaning that practically the water user can only make an out-of-priority diversion of the amount actually received by calling water right. Issues have arisen over the authority of the SEO to charge transit losses when the augmentation or exchange decree provides that the water user can divert an equivalent

154. Ft. Morgan Reservoir & Irrigation Co., v. McCune, 206 P. 393, 395 (Colo. 1922).

155. Pub. Serv. Co. of Colo. v. Willows Water Dist., 856 P.2d 829, 834 (Colo. 1993); See also COLO. REV. STAT. § 37-92-103(10.7).

156. Tongue Creek Orchard Co. v. Town of Orchard City, 280 P.2d 426, 428 (Colo. 1955).

157. Seepage loss is considered a physical phenomenon that is simply included within reservoir operations because there is no means to measure the loss, and generally, there is no net loss or depletion to the stream system. Interview with Ken Knox, Chief Deputy State Eng'r, Colo. Div. of Water Res., in Denver, Colo. (Jan. 5, 2006).

158. COLO. REV. STAT. § 37-87-102(4) (2005).

159. Simpson, *supra* note 45.

160. Steger, *supra* note 1.

amount for the amount released. The SEO asserts, however, that it has the statutory authority to impose the transit loss to prevent injury, even if the decree does not expressly have that condition.¹⁶¹

L. Decreed Capacity v. Physical Capacity

A potential reservoir owner commonly applies for, and receives, a decree for a conditional water right to store an amount of water prior to the actual construction of the reservoir.¹⁶² Upon completion of the reservoir, the actual physical capacity of the reservoir may be different from the decreed capacity. This raises the question of whether the physical capacity or the decreed capacity controls the administration of the amount of water that can be stored. If the physical capacity is less than the decreed capacity, a physical limitation exists and a fill should be based upon the physical capacity.¹⁶³ Unless the reservoir owner can show that they intend to make subsequent modifications to enlarge the reservoir to the originally decreed amount, they ultimately abandon the difference. When physical capacity is greater than decreed capacity, a fill should be based upon the decreed capacity.¹⁶⁴ The reservoir owner would then need to adjudicate a new water right for the difference or hope to fill the difference under free river conditions.

Another issue is how to account for diversions into storage when the reservoir is subject to an operational limitation.¹⁶⁵ An operational limitation can result when the SEO imposes a restriction on the amount stored so that the water does not exceed a certain elevation or gage height, a restriction on the amount drawn down to keep water in the reservoir, or a limit on the amount released from the outlet works. If the SEO places a dam safety restriction on a reservoir and orders the operator not to store water above a certain elevation, the reservoir, and thus the amount of the storage right, is limited to that elevation and the corresponding volume. For example, if a reservoir is decreed for 100,000 acre-feet yet the SEO has restricted the amount the reservoir can safely store to 80,000 acre-feet, then the operator is limited to store 80,000 acre-feet under its water right until the dam safety restriction is removed. Under those conditions, the paper fill would be 80,000 acre-feet, rather than the decreed 100,000 acre-feet.

161. Simpson, *supra* note 45.

162. "‘Conditional water right’ means a right to perfect a water right with a certain priority upon the completion with reasonable diligence of the appropriation upon which such water right is to be used." COLO. REV. STAT. § 37-92-103(6).

163. Simpson, *supra* note 45.

164. *Id.*

165. See COLO. REV. STAT. § 37-87-107 ("Based upon inspection reports and other information affecting the safety of each dam, the state engineer shall determine the amount of water which is safe to impound in the reservoir. It is unlawful for the owners of any reservoir to store in said reservoir water in excess of the amount so determined by the state engineer to be safe.").

M. Start of Fill

The start of fill date commences the new storage year for administrative purposes. This date is important because it marks the calculation of carry-over storage and the determination of the amount of water that the reservoir can store during the new water year.¹⁶⁶ Agricultural users store water to supplement direct flow water rights, so their lowest reservoir levels are generally at the end of the growing season. Therefore, the agricultural irrigation start of fill typically begins November 1. Municipal users draw from stored water throughout the year, so those reservoir levels are typically at their lowest elevation before spring runoff. Currently, Denver Water's start of fill begins April 1.¹⁶⁷

N. End of Fill

End of fill marks the date the storage priority achieves its paper fill or when the reservoir goes out-of-priority. It signifies that the reservoir can no longer store water under its original priority. The reservoir, however, may continue to physically store water during free river conditions, under a refill right or under other supplemental priorities including exchanges.

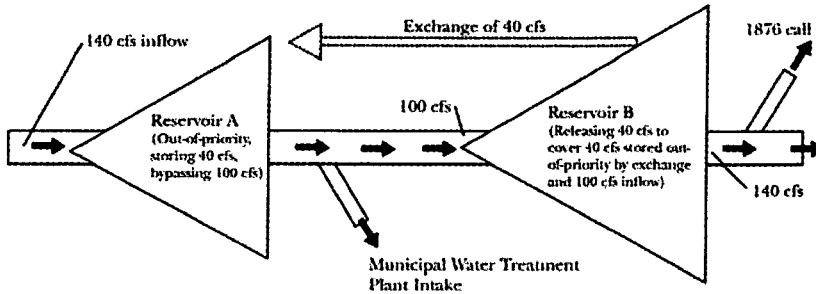
O. Storage Accounting Principles

The water that a reservoir operator has stored under a particular water right maintains that character even if the operator mixes the water with water stored under different water rights. Unless otherwise decreed, the SEO does not require that water stored by one water right count toward the fill of a different water right.¹⁶⁸ The SEO separately honors each decree, and the amount of water carried over from year to year is tracked for each priority.

166. See *Bd. of County Comm'rs of the County of Arapahoe v. Upper Gunnison River Water Conservancy Dist.*, 838 P.2d 840, 851 (Colo. 1992) ("A reservoir is permitted one filling each year; and a storage right is entitled to claim whatever water is available each year to fill that storage decree. Consequently, some date must be selected to fix the time at which the contents of a reservoir will be charged against the next annual fill.") (citations omitted).

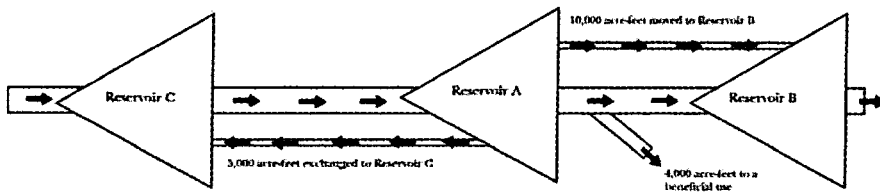
167. Steger, *supra* note 1.

168. One exception to the rule would be if a provision of the decree required that any waters stored under a junior priority be carried over to the senior priority. See *In re Application for Water Rights of City & County of Denver*, Case No. 87CW376, pg.8 (Colo. Water Div. No. 5 February 13, 1997). Another exception is if the other water right is decreed supplemental to the first. See *Orchard Mesa Irrigation Dist. v. Whitten*, 361 P.2d 130, 136 (Colo. 1961).



In this scenario, a municipality needs as much water above its municipal water treatment intake as possible, but Reservoir A is out-of-priority. The operator can operate an exchange by releasing 40 cfs from Reservoir B to the downstream calling right and by diverting an equivalent amount of water out-of-priority into Reservoir A. Reservoir A has a water storage right, a refill right, and a water right to store by exchange. The SEO requires separate accounts to track the each type of water right allocated in the reservoir. The water stored by exchange does not count toward the fill under the storage water right of Reservoir A, but would count towards Reservoir B’s fill as carry over storage, if still in storage at the start of fill for Reservoir B. If Reservoir A comes back into priority, then any amount stored in-priority at that point would count toward the fill of the storage water right. The physical capacity of the reservoir and the principle of storable inflow prevent an expansion under any of the water rights. Any water remaining in the three different accounts at the end of the water year would carry over to the next storage year under the three separate accounts.

Reservoir operators move water stored under a particular reservoir priority to other reservoirs by exchange or direct release. For water originating from the same basin, reservoir operators must add all the water under a particular priority in different reservoirs together, regardless of the place of storage, to determine the amount of water stored under that priority. When an operator moves in-basin water to different places of storage, the SEO requires detailed accounting to prevent an expansion of the amount of water diverted under the original water storage right.



In this scenario, Reservoir A contains 50,000 acre-feet at the start of the water year. During the water year, the reservoir operator delivers

10,000 acre-feet of Reservoir A water to Reservoir B, exchanges 5,000 acre-feet upstream to Reservoir C, and delivers 4,000 acre-feet for beneficial use. At the end of the water year, Reservoir A contains 31,000 acre-feet. At the start of the next water year, however, the SEO considers Reservoir A's carry-over storage to be 46,000 acre-feet (31,000 + 5,000 + 10,000). The SEO counts Reservoir A's water remaining in storage in Reservoir B and C toward the fill of Reservoir A because the water diverted under Reservoir A's water right maintains the "character" of Reservoir A's water right.¹⁶⁹

Some facilities have multiple water rights from the same source that they can exercise for different uses including power generation, storage, direct municipal, and irrigation use. For example, if Reservoir A had co-equal priorities for storage and direct power or municipal use, inflow to the reservoir could be allocated to either water right at the discretion of the owner. A reservoir operator with co-equal direct flow and storage rights will generally try to fulfill the storage right if hydrologic and demand limitations permit.

If, however, a facility has multiple direct or storage water rights from the same source with differing priority dates, the issue arises whether the owner is required to divert its own water rights in order of priority or whether the operator can choose which water right it wishes to exercise. The SEO typically administers multiple rights of one user from the same source in order of priority.¹⁷⁰ If a user prefers to store under a junior storage right or divert under a junior direct flow right, then the SEO counts the exercise of the junior right toward the paper fill of the more senior storage right.

However, this area of law and administration remains unclear. One water court held that the operator should divert its water rights from the same source in order of priority.¹⁷¹ But in a different case, the same court allowed a reservoir operator to divert under a junior priority before the senior water right had been satisfied.¹⁷² It thus appears the water courts will give water users latitude concerning which water rights they exercise depending upon the facts and circumstances of each case and considering the terms and conditions of each decree. If

169. When a water right holder moves water stored under a water right to another structure by delivery or exchange, the diverted water keeps the "character" of the substituted or delivered water. This has sometimes been referred to as the character of exchange rule or a "legal fiction." See, e.g. *City of Thornton v. Bijou Irrigation Co.*, 926 P.2d 1, 55 (Colo. 1996).

170. This method of administration is sometimes referred to as the "senior's first rule." The SEO's goal is not to allow a water user to manipulate the priority system to the detriment of others. Simpson, *supra* note 45.

171. *In re* Application for Water rights of the City of Aurora, Case No. 85CW251 (order) (Colo. Water Div. No. 1 April 28, 1989).

172. *In re* Application for Water Rights of the City of Broomfield, Case No. 88CW008 (Colo. Water Div. 1 March 9, 1989).

the exercise of different water rights at the same facility from the same source would cause injury, then it would be appropriate for the water court to include terms and conditions when the original decrees are adjudicated. Foregoing the exercise of senior rights for the purpose of making a junior right absolute may also be inappropriate depending upon the circumstances.

For example, a water user had a 1909 water right for storage of 20,000 acre-feet for agricultural uses in a reservoir with a capacity of 30,000 acre-feet. Later, the water user applied for a new junior 20,000 acre-foot water right for agricultural and municipal uses. Objectors to the water user's junior water right alleged that the water user could extend the duration of the 1909 water right if the water user could switch to his more junior right during periods of free river, generally the only time that a water right of this date would be in-priority. At trial, those in opposition to the decree convinced the water court that maintaining the historic call regime was necessary to protect their upstream water rights. In order to avoid injury, the water court required the water user to credit diversions under the junior right against his future ability to call for and divert water under the senior right.¹⁷³

However, the SEO does not limit the amount of foreign water stored in the basin of use because the users in that basin are only entitled to the in-basin waters under their individual appropriations.¹⁷⁴ Thus, water users in the basin of use cannot claim injury from the storage of foreign water from another basin because they cannot obtain a right to appropriate the foreign water.¹⁷⁵ Exporting water users do not injure water users in the foreign basin if they divert the water from that basin in-priority and do not exceed the decreed amount.

Some reservoirs have multiple users with different priorities and uses in the same storage facility. This usually leads to administrative difficulties. The issue that arises is how to allocate the inflow to different users with different priorities and keep the storage users, the SEO, and other water users in the watershed happy. Usually the users sharing storage space will enter into an operational agreement defining the allocation of the inflow to different accounts and how the reservoir operator will release the water. Inevitably, a dispute arises among the parties sharing the capacity or from other water right holders on the stream who claim injury. Sharing inflow among different priorities may lead to claims of out-of-priority storage, equitable servitudes, or

173. In *In re Application for Conditional Water Rights of the Farmers Reservoir and Irrigation Co.*, the water court in Water Div. Number 1 included a term and condition that required stored water from the same source to be allocated and accounted to both decrees when the applicant diverted water under a junior storage water right and a senior storage water right was in-priority but not satisfied. Case No. 84CW090 (Colo. Water Div. 1 Mar. 18 1988).

174. *Bijou Irrigation*, 926 P.2d at 66.

175. *Id.* at 66.

expansion of junior storage priorities. Detailed accounting principles that the SEO and the court approves may alleviate the potential for disputes.¹⁷⁶ While incorporating accounting principles in a decree may assure certainty, such principles might not provide the flexibility to adjust to changing circumstances without reopening the decree to include or modify different water accounting principles.

VI. CONCLUSION

In the arid West, droughts are inevitable, inheritably unpredictable, and vary in severity and duration. Storage provides the safety net to endure the dry times. Storage also allows Colorado water users to achieve the maximum beneficial use of water. In 2003, the state engineer observed that:

It is no secret in Colorado that 2002 saw the worst drought in our state in recorded history. In many areas, it was the third consecutive dry year, and it stressed the water supply capabilities of many water providers and users. The value of reservoir water and ground water was clearly realized, and we all recognized that additional storage would have reduced the impact of the drought.¹⁷⁷

So when your crystal ball is not functioning and your storage reserves are at 43%; you start to wish that (1) it would start to rain, or (2) you had more storage. Therefore, a dedicated focus on protecting, promoting, and developing storage systems and demand management techniques is needed to weather the storms on the horizon, and thus provide future water users the same security that we enjoy today when Mother Nature decides that we are taking her for granted.

176. See, e.g., *Bd. of County Commissioners v. Upper Gunnison River Water Conservancy Dist.*, 838 P.2d 840, 847, 856-57 (Colo. 1992).

177. COLO. DIV. OF WATER RES., 2002 ANN. REP., available at http://water.state.co.us/pubs/annualreport/annlrpt_2002.PDF.

