

# RAINWATER HARVESTING: A NEW WATER SUPPLY OPTION IN COLORADO?

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## 1. LEGAL RIGHT TO USE PRECIPITATION IN COLORADO

In Colorado, “the water of every natural stream” is subject to the doctrine of prior appropriation. Colo. Const. Art. XVI, §§ 5, 6. This doctrine also applies to all water that is tributary to natural surface streams. C.R.S. § 37-82-101(1). Further, all “[f]lowing water, even diffuse runoff and seepage that is not in a defined channel, is presumed to be tributary to the river system.” *Ready Mixed Concrete Co. v. Farmers Reservoir & Irrigation Co.*, 115 P.3d 638, 642 (Colo. 2005); *see also R.J.A., Inc. v. Water Users Ass’n of Dist. No. 6*, 690 P.2d 823, 826 (Colo. 1984) (holding that “seepage and percolation belong to the river,” and “it is presumed that all ground water finds its way to the stream in the watershed in which it lies”). Accordingly, all water that falls as precipitation is assumed to ultimately contribute to flows in the stream, and is deemed to be part and parcel of the water that existing water rights are entitled to use in accordance with their decreed priorities. Intercepting precipitation that is presumed to otherwise migrate to a stream could interfere with the full allocation of existing water rights.

In a series of court cases, several would-be water rights appropriators attempted to obtain water rights by reducing or eliminating vegetation that consumed water. These appropriators argued that by eliminating such vegetation, additional water was made available to the river system that had not previously been available, and that they should get to use that water without regard to meeting the demands of senior appropriators. In each case, the Colorado Supreme Court rejected the attempted appropriations, but in doing so, has recognized, “No one on any river would be adverse to a schematic and integrated system of developing this kind of water supply with control and balancing considerations. But to create such a scheme is the work of the legislature . . . .” *Southeastern Colo. Water Conservancy Dist. v. Shelton Farms, Inc.*, 187 Colo. 181, 192, 529 P.2d 1321, 1327 (1974); *see also R.J.A., Inc. v. Water Users Ass’n of Dist. No. 6*, 690 P.2d 823, 829 (Colo. 1984) and *State Engineer v. Castle Meadows, Inc.*, 856 P.2d 496 (Colo. 1993). Before built-in controls and balances can be struck, a methodology needs to be developed that can be used to reliably calculate the amount of water potentially available from rainwater harvesting without injuring other water rights.

In addition to the case law, in 1975 the Colorado legislature codified the supreme court’s rejection of the claim in the *Shelton Farms* case by revising the definition of a “plan for augmentation” to affirm that “neither the salvage of tributary waters by eradicating phreatophytes nor the increase of runoff by making land surfaces impermeable provides an increased supply of water that may be utilized to support a plan for augmentation.” C.R.S. § 37-92-103(9). As a result, current Colorado law requires 100% of any precipitation captured out-of-priority for later beneficial use to be replaced to the stream system in like time, place, and amount.

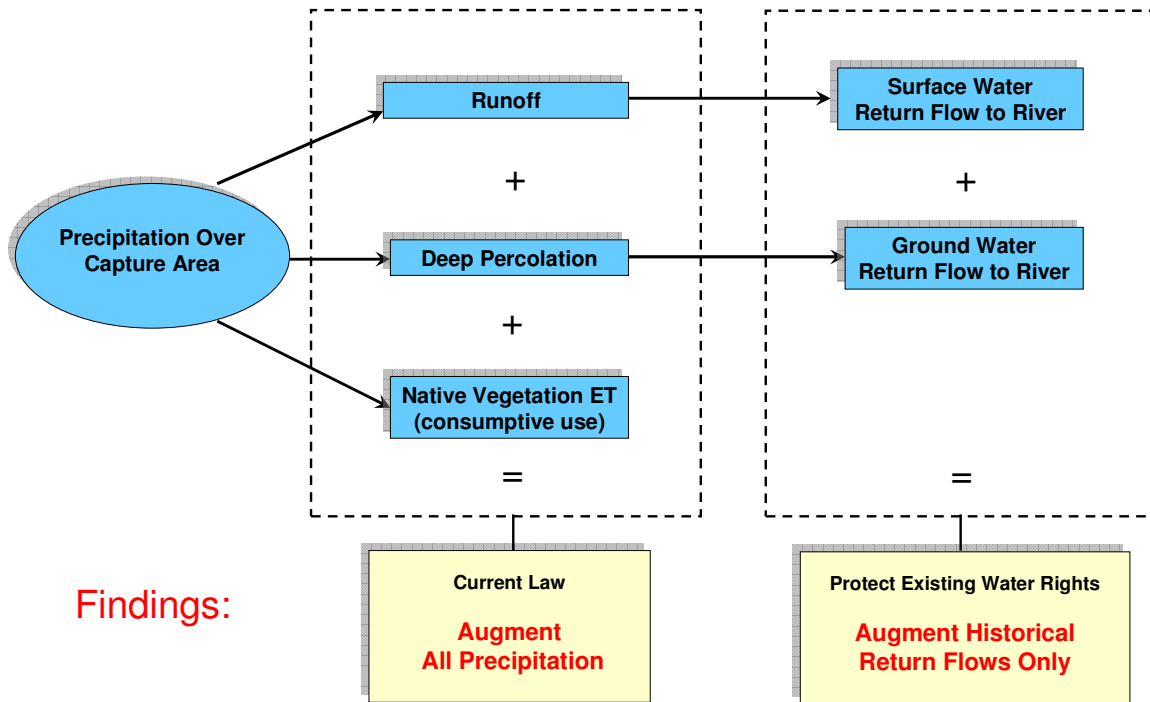
However, there are two statutory exceptions that expressly recognize that not all precipitation is a supply to existing water rights: C.R.S. § 37-84-117(5) concerning on-stream reservoir evaporation, and C.R.S. § 37-80-120(5) and C.R.S. §37-92-305(12) concerning gravel pit pond evaporation. These statutes allow “credit” to be taken against the amount of water that would otherwise need to be provided to offset evaporation from the exposure of groundwater based on the portion of the precipitation that did not historically reach the stream system due to consumption by native vegetation through evapotranspiration (ET).<sup>1</sup>

A procedure for estimating the ET credit is outlined in the Division of Water Resources’ General Guidelines for Substitute Water Supply Plans for Sand and Gravel Pits Submitted to the State Engineer Pursuant to Senate Bill 89-120 & Senate Bill 93-260. As stated in the Guidelines, the Division of Water Resources generally accepts an ET Credit of 70% of the total precipitation for each month for non-irrigated native sites with a deep water table and without phreatophytes or subirrigation. The 70% is based on an effective precipitation calculation that suggests 70% of the total precipitation was historically effective at meeting consumptive use demands of native vegetation, and therefore *did not* return to the stream system. The Guidelines specify that higher ET credits must be supported by appropriate engineering documentation; according to the Division of Water Resources, higher ET credits have been accepted in the past (Wolfe, 2006).

In 2007, Ryley Carlock and Applewhite, along with Leonard Rice Engineers and Meurer & Associates (now Kennedy/Jenks Consultants) completed a study entitled “Holistic Approach to Sustainable Water Management in Northwest Douglas County.” One of the primary purposes of this study was to identify the potential of precipitation as a water supply, including a recommended methodology to quantify the renewable/sustainable yield, and to quantify the augmentation requirements to protect existing water rights. Even though Colorado’s current law requires augmentation of 100% of captured precipitation, the portion of the precipitation falling over a native site that was consumed by ET from native vegetation and sublimation (loss of water through evaporation of snow) was not historically available to senior water rights, as is recognized in the on-stream reservoir and gravel pit evaporation credit statutes. The figure below depicts a comparison between augmentation requirements under current law versus what we know actually happens – some of the precipitation that occurs is consumed by native vegetation, so historically only a certain portion of precipitation has returned to the stream system through either surface runoff or deep percolation. It is only the portion of precipitation that was not historically consumed by native vegetation that would need to be augmented in order to protect other water rights.

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<sup>1</sup> As described under the Colorado Division of Water Resources Policy 2004-3, evapotranspiration (ET) credit is defined as “ET Credit as utilized in the policy is equal to the sum of ET Credit from eradicated phreatophytes and ET Credit from effective precipitation on natural vegetation.”



**Components of Legal versus Physical Augmentation Requirements to Protect other Water Rights**

While most scientists and engineers agree that there is a component of the total precipitation that did not historically reach the stream system and therefore could be used in new ways without injuring other water rights, a methodology is needed to quantify that amount. Further, for rainwater harvesting to become a viable component of water supply planning in Colorado, legislation would need to be enacted defining the circumstances under which precipitation capture, including appropriate credit for historic patterns of native vegetation ET, could be implemented, taking into consideration adequate balancing and control mechanisms to protect other valuable state resources.

Additional information can be found at [www.cwcb.co.us/Conservation/RelatedInformation/Publications/](http://www.cwcb.co.us/Conservation/RelatedInformation/Publications/) (“Holistic Approach to Sustainable Water Management in Northwest Douglas County,” Leonard Rice Engineers, Inc., Meurer and Associates, and Ryley Carlock and Applewhite)