



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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ARIZONA GROUNDWATER LAW

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Arizona depends on groundwater to supply nearly 40% of the State's annual water demand. To protect this essential public resource, Arizona has developed a complex mix of common law interpreted by the courts, statutory provisions enacted by the Arizona Legislature, and regulations enforced by the Arizona Department of Water Resources. This article will describe the basic principles of Arizona groundwater law and discuss some of the most significant issues associated with the use of groundwater in Arizona today.

LEGAL ISSUES

Common Law Issues

There are two elements central to understanding Arizona's common law as it relates to groundwater. First and foremost, Arizona has always maintained separate and incompatible legal regimes for surface water and groundwater. While surface water is subject to the priority system of "first in time, first in right" under the Prior Appropriation Doctrine, groundwater is subject to the doctrine of reasonable use, which does not focus on time-based priority for determining rights to limited supplies of groundwater. Second, for more than 70 years, the courts have struggled to develop a workable definition of the boundary between appropriable surface water (subject to the Prior Appropriation Doctrine) and non-appropriable percolating groundwater (not subject to the Prior Appropriation Doctrine). Each of these issues will be discussed below.

Arizona's Bifurcated System of Water Law

Arizona has maintained separate groundwater and surface water regimes for over 100 years. In fact, percolating groundwater was held not subject to the Prior Appropriation Doctrine by the Arizona Territorial Supreme Court eight years before Arizona became a State. In the case of *Howard v. Perrin*, 76 P. 460 (1904), *aff'd* 200 U.S. 71 (1906), the court stated that "filtrating or percolating water oozing through the soil beneath the surface in undefined and unknown channels, and therefore a component part of the earth," has "no characteristic of ownership distinct from the land itself, and therefore [is] not the subject of appropriation by another, but belong[s] to the owner of the soil." *Id.* at 462.

In 1931, the Arizona Supreme Court reaffirmed *Howard v. Perrin's* conclusion that "percolating subterranean waters [are] not subject to appropriation..." *Maricopa County Municipal Water Conservation Dist. No. 1 v. Southwest Cotton*, 4 P.2d 369, 376 (1931) (*Southwest Cotton*). The Court also noted that "the presumption is that underground waters are percolating in their nature. He who asserts that they are not must prove his assertion affirmatively by clear and convincing evidence." *Id.* The Court then went on to discuss the legal boundary between percolating groundwater and waters that are so closely associated with surface streams that they are considered "a part of the surface stream itself, and are simply incidental thereto..." *Id.* at 380. The Court identified this latter category of underground water as "subflow."

Arizona Groundwater

Competing GW Use

No Liability

Strict Interpretation

GWA Impetus

The Doctrine of Reasonable Use

The doctrine of reasonable use was formally adopted by the Arizona Supreme Court (Court) in *Bristor v. Cheatham*, 255 P.2d 173 (1953). The Court compared the doctrine of reasonable use to the doctrine of correlative rights and concluded the doctrine of reasonable use provided the better basis for governing access to groundwater among neighboring landowners. *Id.* at 178. The doctrine of reasonable use “does not prevent the extraction of ground water subjacent to the soil so long as it is taken in connection with a beneficial enjoyment of the land from which it is taken. If it is diverted for the purpose of making reasonable use of the land from which it is taken, there is no liability incurred to an adjoining owner for a resulting damage.” *Id.* at 180. This is the essential concept of the doctrine of reasonable use as applied in Arizona. So long as a landowner withdraws groundwater to make reasonable and beneficial use of the landowner’s property, neighboring landowners have no claim for damages even if the groundwater withdrawals adversely affect water levels under the neighbors’ property.

The Court in *Bristor* placed an important limitation on the doctrine, however, by concluding that the defendants in the case were not protected against the claims of their neighbors because the defendants were withdrawing groundwater from one parcel of land and transporting it approximately three miles away to be used on other land. Because this withdrawal of groundwater did not benefit the property from which it was withdrawn, the property owner was not immune from liability. *Id.*

In the years after *Bristor* was decided, the Court decided a series of cases that sometimes strictly interpreted the limitation on transportation of groundwater away from the site of pumping, and at other times invoked equitable principles to allow limited transportation. The culmination of this line of cases came in 1976, when the Court decided *Farmers Investment Co. v. Bettwy*, 558 P.2d 14 (1976) (*FICO*). In *FICO*, the Court imposed a strict interpretation of the transportation rule, and issued injunctions against several mining companies and the City of Tucson, all of which were engaged in transportation of groundwater away from the site of pumping. The Court held that “[w]ater may not be pumped from one parcel and transported to another just because both overlie the common source of supply if the plaintiff’s lands or wells upon his lands thereby suffer injury or damage.” *Id.* at 21.

Because the Court’s decision threatened to disrupt both economically important mining operations in the State and municipal deliveries of water to many thousands of residential and commercial water users, the *FICO* opinion created enormous controversy. This controversy ultimately led to adoption of the 1980 Groundwater Management Act (discussed in detail below) after several years of negotiations among competing water interests.

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Constitutional Challenges to the Groundwater Management Act

Following adoption of the Groundwater Management Act (Act) several parties challenged the constitutionality of the Act. These parties asserted that the Act’s limitations on a landowner’s right to pump and use groundwater constituted a “taking” of private property without compensation. The plaintiffs relied on language in many of the cases discussed above stating that groundwater belonged to the owner of the overlying land.

Despite these numerous prior statements suggesting that landowners owned the water under their lands, the Court held that the 1980 Groundwater Management Act is constitutional in *Town of Chino Valley v. City of Prescott*, 638 P.2d 1324 (1981) (*Chino Valley*). In doing so, the Court rejected the plaintiffs’ reliance on *Howard v. Perrin*, *Southwest Cotton* and other cases declaring that “[d]ictum thrice repeated is still dictum...We therefore hold that the statement first made in *Howard v. Perrin* and reiterated under circumstances where the exact nature of the overlying owner’s rights to the water beneath his property were not in question is not precedent for the decision in this case.” *Id.* at 1327. After thus reducing the status of its prior pronouncements on this issue to mere dictum, the Court continued at page 1327:

The statements in *Bristor* and *Jarvis* do not mean that rights to the use of groundwaters cannot be modified prospectively by the Legislature. They only mean that courts will adhere to an announced rule to protect rights acquired under it and that if any change in the law is necessary, it should be made by the Legislature...We therefore hold that since the Act of 1980 is prospective in application, it is not a legislative encroachment on judicial powers.

The Court continued by explaining the nature of a landowner’s right to percolating groundwater under the landowner’s property (*Id.* at 1328): “In the absolute sense, there can be no ownership in seeping and percolating waters until they are reduced to actual possession and control by the person claiming them because of their migratory character. Like wild animals free to roam as they please, they are the property of no one.”

AMA = Active Management Area



Arizona Groundwater	Finally the Court quoted a case decided by the Florida Supreme Court to support its distinction between ownership of percolating water and a usufructary right:
"Usufruct"	The common-law concept of absolute ownership of percolating water while it is in one's land gave him the right to abstract from his land all the water he could find there. On the other hand, it afforded him no protection against the acts of his neighbors who, by pumping on their own land, managed to draw out of his land all the water it contained. Thus the term 'ownership' as applied to percolating water never meant that the overlying owner had a property or proprietary interest in the corpus of the water itself...The right of the owner to groundwater underlying his land is to the usufruct of the water and not to the water itself. <i>Id.</i> (quoting <i>Village of Tequesta v. Jupiter Inlet Corp.</i>, 371 So. 2d 663, 666-67 (Fla. 1979)).
Capture Rule	Based on this statement of the law, the Court then held "that there is no right of ownership of groundwater in Arizona prior to its capture and withdrawal from the common supply and that the right of the owner of the overlying land is simply to the usufruct of the water." <i>Chino Valley</i>, 638 P.2d at 1328. Finally, the Court concluded that the 1980 Groundwater Management Act did not violate the constitutional prohibitions on "taking" of private property without due process and just compensation. <i>Id.</i> Water users in the State have been operating under the requirements of the Act ever since.
"Subflow" Defined	Subflow Zone Issues As noted above, the Court adopted the concept of "subflow" to address groundwater that is so intimately related to surface streams that it should be administered under the Prior Appropriation Doctrine along with the surface water of those streams. See <i>Southwest Cotton</i>, 4 P.2d at 380. The Court defined subflow as "those waters which slowly find their way through the sand and gravel constituting the bed of the stream, or the lands under or immediately adjacent to the stream, and are themselves a part of the surface stream." <i>Id.</i>
Adjudication Test	From 1931 to 1987, the question of subflow was not actively addressed by the courts. In 1987, however, the trial court presiding over the Gila River Adjudication held hearings to address the interrelationship between surface water and groundwater. These hearings culminated in an order by the trial court that was intended to establish a test for differentiating between non-appropriable percolating groundwater and appropriable subflow. On appeal, the Arizona Supreme Court rejected the test. <i>In re the General Adjudication of All Rights to Use Water in the Gila River System and Source</i>, 857 P.2d 1236 (Ariz. 1993) (<i>Gila II</i>). In doing so, the Court emphasized the importance of applying an accurate test to determine whether a well is pumping subflow, concluding that:
Flawed Test	use of a flawed test for identifying wells pumping subflow could cause significant injustice. Many surface owners unable to mount a challenge could effectively lose their right to pump percolating groundwater, simply because their wells were improperly presumed to be pumping appropriable subflow. Considering the time, expense, and importance of accurate hydrographic survey reports, and the complex lawsuits over their correctness, it would be a senseless waste to use a flawed presumption for identifying wells pumping subflow. <i>Id.</i> at 1242-43.
"Too Late"	In reaching this conclusion, the Court relied on its prior opinion in <i>Southwest Cotton</i> and concluded: [I]t is too late to change or overrule the case. More than six decades have passed since <i>Southwest Cotton</i> was decided. The Arizona legislature has erected statutory frameworks for regulating surface water and groundwater based on <i>Southwest Cotton</i>. Arizona's agricultural, industrial, mining, and urban interests have accommodated themselves to those frameworks. <i>Southwest Cotton</i> has been part of the constant backdrop for vast investments, the founding and growth of towns and cities, and the lives of our people. <i>Id.</i> at 1243.
"Subflow" Narrowed	The Court then stated that the <i>Southwest Cotton</i> decision "meant it when it said that in almost all cases 'subflow is found within or immediately adjacent to, the bed of the surface stream itself.' Subflow is a narrow concept. Thus, all water in a tributary aquifer is not subflow." <i>Id.</i> at 1245. The Court then remanded the issue back to the trial court for further proceedings to devise a test for determining subflow in a manner consistent with <i>Southwest Cotton</i> and <i>Gila II</i>.
	In 1993 and 1994, the trial court conducted a series of hearings intended to establish criteria that would be used to identify the subflow zone. This court concluded that a subflow zone could only exist "adjacent [to] and beneath a perennial or intermittent stream and not an ephemeral stream." The court then

Arizona Groundwater

Subflow Criteria

adopted the following criteria to be used for identifying the geologic unit that would constitute the subflow zone:

[I]n order to fulfill the definition of “subflow,” the geologic unit must be saturated because of the need for a hydraulic connection between the stream and the “subflow.”

...

When it is saturated, that part of the unit qualifies as the “subflow” zone, where the water which makes up the saturation flows substantially in the same direction as the stream, and the effect of any side discharge from tributary aquifers and basin fill is overcome or is negligible.

...

If we add the following additional criteria, then even more certainty and reliability is provided. *First*, the water level elevation of the “subflow” zone must be relatively the same as the stream flow’s elevation. *Second*, the gradient of these elevations for any reach must be comparable with that of the levels of the stream flow. *Third*, there must be no significant difference in chemical composition that cannot be explained by some local pollution source which has a limited effect. *Fourth*, where there are connecting tributary aquifers or floodplain alluvium of ephemeral streams, the boundary of the “subflow” zone must be at least 200 feet inside of that connecting zone so that the hydrostatic pressure effect of the side recharge of this tributary aquifer is negligible and the dominant direction of flow is the stream direction. *Fifth*, where there is a basin-fill connection between saturated zones of the floodplain Holocene alluvium and a saturated zone of basin fill, the boundary of the “subflow” zone must be 100 feet inside of the connecting zone so that the hydrostatic pressure effect of the basin-fill’s side discharge is overcome and the predominant direction of flow of all of the “subflow” zone is the same as the stream’s directional flow. *In re the General Adjudication of all Rights to Use Water in the Gila River System and Source*, 9 P.3d 1069, 1074 (Ariz. 2000) (*Gila II*) (quoting trial court’s June 30, 1994 order).

On the basis of these criteria, the trial court gave a name to the subflow zone – the “saturated floodplain Holocene alluvium.”

Following issuance of the trial court’s order, numerous parties once again petitioned the Arizona Supreme Court for interlocutory review of these criteria. The Supreme Court accepted review, approved the criteria, and affirmed the trial court’s order “in all respects.” *Id.* at 1083. The Court concluded on that same page:

ADWR Determination

The subflow zone is defined as the saturated floodplain Holocene alluvium. DWR [Arizona Dept. of Water Resources], in turn, will determine the specific parameters of that zone in a particular area by evaluating all of the applicable and measurable criteria set forth in the trial court’s order and any other relevant factors. All wells located within the lateral limits of the subflow zone are subject to the adjudication. In addition, all wells located outside the subflow zone that are pumping water from a stream or its subflow, as determined by DWR’s analysis of the well’s cone of depression, are included in this adjudication. Finally, wells that, though pumping subflow, have a de minimus effect on the river system may be excluded from the adjudication based on rational guidelines for such an exclusion as proposed by DWR and adopted by the trial court.

De Minimus Rule

Pending Litigation

After the Court remanded the subflow issue once again, the trial court evaluated tests designed to implement the *Gila IV* decision. Litigation over the meaning of the criteria and the validity of the proposed tests continues at this time, with yet another petition for interlocutory review currently pending before the Court. When and how this issue will be resolved cannot be guessed at this time.

GWA of 1980

ARIZONA’S GROUNDWATER MANAGEMENT ACT

Overview

The Groundwater Management Act of 1980 enacted a comprehensive statutory scheme to regulate groundwater rights and uses in Arizona. The major components of the Act are codified as the Arizona Groundwater Code (Code) in Title 45, Article 2 of the Arizona Revised Statutes (A.R.S.). The Code occupies more than 120 pages of single-spaced text in a volume of water law statutes published by the State Bar of Arizona. The Code addresses a broad range of issues relating to withdrawal and use of groundwater in Arizona.

Arizona Groundwater	Most of the regulatory provisions of the Code apply only within the five “Active Management Areas” (AMAs) of the State. When originally established in 1980, these AMAs were intended to encompass the areas of the State where the most significant groundwater uses were occurring and where the threat of groundwater overdraft was greatest. The Groundwater Management Act established four initial AMAs, surrounding the Phoenix metropolitan area (Phoenix AMA), the Tucson metropolitan area (Tucson AMA), the Prescott area (Prescott AMA), and an area of large-scale agricultural production between Phoenix and Tucson (Pinal AMA). In 1994, the Legislature created the Santa Cruz AMA, the State’s fifth AMA, by splitting off the southern portion of the original Tucson AMA.
“Active Management Areas”	Within these five AMAs, most of the detailed regulatory requirements of the Code apply. The Code also contains provisions allowing creation of subsequent AMAs should hydrologic conditions and expanding groundwater uses justify doing so. Subsequent AMAs may either be created by determination of the Director of the Arizona Department of Water Resources (ADWR) or by local initiative of residents within a groundwater basin. To date, no subsequent AMAs have been created by either method. However, with increasing development now occurring outside the five existing AMAs, creation of one or more subsequent AMAs could occur within the foreseeable future.
Grandfathered GW Rights	Groundwater Rights within AMAs As a general matter, and with only a few narrow but important exceptions, groundwater uses within AMAs are determined by historic use of groundwater during the five year period prior to creation of the AMA. These types of rights are referred to as “grandfathered” groundwater rights. There are three kinds of grandfathered groundwater rights: Irrigation Grandfathered Rights; Type 1 Non-Irrigation Grandfathered Rights; and Type 2 Non-Irrigation Grandfathered Rights.
IGR Limits	Irrigation Grandfathered Rights Irrigation Grandfathered Rights (IGRs) are created pursuant to A.R.S. § 45-465. IGRs are created for lands that were being irrigated at any time within the five years prior to creation of the AMA. These rights are appurtenant to the lands that were irrigated (irrigation acres) and the groundwater pumped pursuant to an IGR may not be transported for use on other lands. The quantity of water that may be used on the irrigation acres is determined by ADWR pursuant to a formula set forth in Section 45-465, subject to additional conservation measures imposed by ADWR through a series of decade-long management plans (described below).
Retiring Irrigation Acres	Type 1 Rights Type 1 Non-Irrigation Grandfathered Groundwater Rights (Type 1 Rights) are created pursuant to A.R.S. §45-463 (for lands retired from irrigation prior to creation of the AMA) or §45-469 (for lands retired from irrigation after creation of the AMA). Type 1 Rights are created by permanently retiring irrigation acres from agriculture. Upon submittal to and approval by ADWR of a development plan, the water right is converted to a non-irrigation use at a quantity of three acre-feet per retired irrigation acre. Thereafter, the groundwater may be used for non-irrigation purposes. The Groundwater Code includes complicated rules that determine where and how Type 1 groundwater can be used, depending on whether the original owner of the IGR or a subsequent owner is making use of the water.
Non-Irrigation Rights	Type 2 Rights Type 2 Non-Irrigation Grandfathered Groundwater Rights (Type 2 Rights) are rights established based on historic use of groundwater for non-irrigation purposes. For example, Type 2 Rights have been established for pre-AMA use of groundwater for industrial purposes, power plants, mining activities, dairy operations and large-scale watering of turf facilities (<i>e.g.</i> golf courses). Type 2 Rights are established pursuant to A.R.S. § 45-464. Generally, Type 2 Rights may be used for any non-irrigation use anywhere within the same AMA in which the original right was created. The only limitations on new uses apply to Type 2 Rights originally granted for electrical energy generation or for mineral extraction and processing. Such rights may only be used for the original purpose for which they were granted (<i>i.e.</i>, either power generation or mineral extraction/processing). A.R.S. § 45-471(A). A Type 2 Right (including those granted for power production or mining purposes) may also be sold (in its entirety) or leased (either all or part of a right) and the point of withdrawal can be designated as any well within the AMA. As a result, these are very flexible rights and they have an established market value within each AMA.
Flexibility	Non Grandfathered Groundwater Rights in AMAs
Three Exceptions	There are three significant exceptions to the general rule that groundwater rights within AMAs are based on “grandfathered” water uses prior to creation of the AMA. The first exception authorizes cities,

Arizona Groundwater	towns, private water companies and irrigation districts to pump groundwater and serve customers within their “service areas.” These service area rights are governed by the provisions of Article 6 of the Code (A.R.S. § 45-491 <i>et seq.</i>). The second exception authorizes issuance of groundwater withdrawal permits for specific purposes within AMAs. Finally, exempt wells serving limited non-irrigation uses may be drilled within AMAs. Each of these categories of groundwater rights will be discussed below.
“Service Areas”	SERVICE AREA RIGHTS Cities, towns and private water companies in Arizona may withdraw and transport groundwater within their service areas and deliver it to landowners and residents within those service areas pursuant to A.R.S. § 45-492. Transportation of groundwater, however, is subject to the transportation provisions of Articles 8 and 8.1 of the Code (discussed below). In addition, uses of water by landowners and residents are subject to conservation requirements imposed by ADWR through the management plans published for each AMA. Unlike grandfathered groundwater rights, service area rights are allowed to expand (both in geographic area and in quantity of water) to serve growing populations of residents. <i>See</i> A.R.S. § 45-493. A city, town or private water company may not, however, expand its service area primarily to include a well field within the service area, to add a disproportionately large industrial customer, or to include irrigation acres for purposes of converting from irrigation to non-irrigation uses. <i>Id.</i>
Allowable Expansion	Irrigation districts also may withdraw and transport groundwater within their service areas and deliver it to landowners within those service areas pursuant to A.R.S. § 45-494. As with city, town and private water company service area rights, these activities are subject to the transportation provisions of Articles 8 and 8.1 of the Groundwater Code and to conservation requirements imposed by ADWR through its management plans.
New GW Use	GROUNDWATER WITHDRAWAL PERMITS Under certain circumstances, ADWR may issue (and in some cases “shall” issue) groundwater withdrawal permits to allow new groundwater uses within AMAs. Withdrawal permits are available for: (i) dewatering in connection with mining activities; (ii) mineral extraction and processing activities; (iii) general industrial uses; (iv) withdrawals of poor quality groundwater; (v) temporary groundwater withdrawals for electrical generation purposes; (vi) temporary dewatering for construction purposes or to ensure structural integrity of improvements; (vii) drainage of irrigated lands to prevent water logging; and (viii) hydrologic testing purposes.
Exempt Wells Limits	EXEMPT WELLS The third significant type of non-grandfathered groundwater right available within AMAs is the right to pump groundwater from “exempt wells.” These are wells having a pump capacity of 35 gallons per minute or less. A.R.S. § 45-454. A landowner may drill such a well after submitting to ADWR a “notice of intention to drill.” Water from exempt wells may only be used for non-irrigation purposes, including domestic, stock watering, commercial and small-scale industrial uses. Domestic water use from an exempt well may include the application of water to less than two acres of land for purposes of growing crops for human or animal consumption. Uses for purposes other than domestic or stock watering are limited to not more than ten acre-feet per year. <i>Id.</i>
“Safe-Yield”	Groundwater Management Requirements within AMAs With the exception of groundwater withdrawn from exempt wells, groundwater uses within AMAs are generally subject to water conservation and management standards promulgated by ADWR pursuant to Article 9 of the Code (A.R.S. § 45-561 <i>et seq.</i>). This article first establishes a specific “management goal” for each AMA in the State. For the Phoenix, Tucson and Prescott AMAs, the management goal is “safe-yield”—defined by the Code as “a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.” A.R.S. § 45-561(12). Safe-yield in the Phoenix, Tucson and Prescott AMAs is to be achieved by 2025. A.R.S. § 45-562(A).
“Planned Depletion”	For the Pinal AMA, the management goal is to “allow development of non-irrigation uses...and to preserve existing agricultural economies...for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.” A.R.S. § 45-562(B). This is often referred to as a goal of “planned depletion” because it allows continued access to groundwater for both irrigation and increasing amounts of non-irrigation uses while water tables in parts of the AMA continue to decline. With residential development now rapidly increasing in the Pinal AMA (the area between Phoenix and Tucson), ADWR has begun to evaluate how to ensure that this management goal can be met for the long term.
Decline Prevention	Finally, the management goal for the Santa Cruz AMA is to “maintain a safe-yield condition...and to prevent local water tables from experiencing long-term declines.” A.R.S. § 45-562(C).

Arizona Groundwater	Groundwater Management Plans To ensure progress toward the management goals for each AMA, ADWR is required to publish a series of management plans that impose water conservation measures on groundwater users in each AMA. <i>See</i> A.R.S. § 45-562—568. Each management plan governs a period of ten years, except for the fifth management plan, which will apply to the years 2020 through 2025, when the Phoenix, Tucson and Prescott AMAs are to achieve their safe-yield goals. For each plan, ADWR is required to impose: (i) irrigation water duties for agricultural users; (ii) conservation requirements for all non-irrigation groundwater users, including industrial users (which must be based on the “latest commercially available conservation technology consistent with reasonable economic return”); (iii) reductions in per capita water use by municipal groundwater users; and (iv) “economically reasonable conservation requirements for the distribution of water” by cities, towns, private water companies and irrigation districts. <i>Id.</i> ADWR is currently imposing the standards promulgated in the third management plan for each AMA. The fourth management plans will be developed between now and 2010.
Conservation Measures	Assured Water Supply Requirements One of the most important functions ADWR serves within AMAs is to administer the Assured Water Supply program. This program is mandated by A.R.S. § 45-576. Under this program real estate developments involving subdivision of land into six or more lots are required to demonstrate that they have secured the necessary water supplies to serve all current and future water demands of the development for a period of 100 years. ADWR has promulgated detailed regulations to implement this requirement (Arizona Administrative Code, Title 12, Chapter 15, Article 7). A development may make the required demonstration in one of two ways — either by obtaining a “commitment to serve” from a “designated” water provider (city, town or private water company), or by submitting the necessary information to obtain a “certificate of assured water supply” specific to the individual development.
Assuring Supply	Cities, towns and private water companies can become “designated” by demonstrating that they have sufficient supplies of water physically, legally and continuously available to meet the current and committed water demands within their service areas. Certificate applicants must make the same demonstration for an individual development. In addition, the sources of water — for both designated providers and certificate applicants — must be primarily renewable supplies such as surface water, Central Arizona Project water, effluent, or water previously stored underground that qualifies for long-term storage credits (discussed below). Only limited quantities of groundwater are allowed to be part of the water supply to ensure that new development does not inhibit the ability to achieve the management goal for each AMA.
Designated Providers	One of the innovative ways created by the legislature to allow municipal providers and certificate applicants to demonstrate consistency with the management goal for the Phoenix, Tucson and Pinal AMAs is the establishment of the Central Arizona Groundwater Replenishment District (CAGRD). Interested parties may enroll either a municipal service area or an individual development in the CAGRD. Following enrollment, any “excess groundwater” (<i>i.e.</i>, groundwater exceeding amounts deemed consistent with the management goal for each AMA) pumped to serve the enrolled area is subject to payment of a replenishment fee. This fee is then used by CAGRD to secure and store underground (<i>i.e.</i>, replenish) an equivalent quantity of renewable water supplies. The current replenishment fees for these activities exceed \$200 per acre-foot of water subject to the replenishment obligation and are expected to rise steadily in future years as available renewable supplies become fully utilized.
Renewable Supplies	Underground Storage of Non-Groundwater Supplies
Replenishment Fee	Another innovative program enacted by the Arizona Legislature allows parties to store renewable water supplies in underground aquifers and thereby earn “long-term storage credits” that can later be recovered for future use. During the years this program has existed, various entities in the State of Arizona have stored more than four million acre-feet of renewable water supplies in underground aquifers. The vast majority has been Central Arizona Project water imported from the Colorado River, but significant and growing quantities of effluent, and limited quantities of in-state surface water have also been stored.
Aquifer Storage	The underground storage program is authorized by Chapter 3.1 of Title 45 of the Arizona Revised Statutes (A.R.S. § 45-801.01 <i>et seq.</i>). Interested parties may apply to ADWR for a permit to store water in “underground storage facilities” or “groundwater savings facilities.” The facilities themselves are subject to a separate storage facility permit requirement because often one party will hold a storage facility permit, but contract with multiple additional parties to allow storage of varied water supplies at the facility. Finally, a third permit is required to subsequently recover the stored water for future use (“recovery well permits”).
Facilities Permits	The two types of facilities where storage may occur operate in very different ways. “Underground storage facilities” are locations where water is physically placed into an aquifer, either through infiltration basins or injection wells. Storage facilities may either be constructed facilities (<i>e.g.</i>, basins or wells
Facilities Operations	

Arizona Groundwater	constructed in a location allowing efficient infiltration of water to the aquifer) or “managed underground storage facilities” that are “designed and managed to utilize the natural channel of a stream to store water underground” (A.R.S. § 45-802.01(12)). This latter category of facility allows permit holders to discharge water into normally dry riverbeds and allow infiltration to the underlying aquifer without the expense of constructing and maintaining infiltration basins or injection wells.
Groundwater “Savings”	In contrast, “groundwater savings facilities” are locations — usually the service areas of irrigation districts — where groundwater would normally be pumped pursuant to irrigation grandfathered rights or other rights to withdraw groundwater within an AMA. In such locations, permits may be granted where the applicant demonstrates that “groundwater withdrawals are eliminated or reduced by recipients who use in lieu water on a gallon-for-gallon substitute basis for groundwater that otherwise would have been pumped from within that active management area” (A.R.S. § 45-802.01(8)). In essence, the operator of the groundwater savings facility agrees to reduce groundwater pumping and instead use the renewable water supplies provided by a third party. In return, the third party may earn long-term storage credits for later use in a quantity equivalent to the amount of water delivered to the facility operator (minus, in most cases, a 5% “cut to the aquifer”).
Storage Credits	
Aquifer “Out”	Long-term storage credits may be earned for underground storage if the requirements of A.R.S. § 45-852.01 are satisfied. This statute requires that, to qualify for long-term storage credits, the stored water must be “water that cannot reasonably be used directly.” In-state surface water (<i>i.e.</i> , not Central Arizona Project water) generally will not qualify because infrastructure already exists to make direct use of most of this resource. Central Arizona Project water usually will qualify as “water that cannot reasonably be used directly,” but only in amounts that exceed the amount of groundwater being pumped in the year of storage by the party holding the storage permit. A.R.S. § 45-802.01(22). Effluent is defined by statute as “water that cannot reasonably be used directly” until 2025. <i>Id.</i>
Long-Term Credits	Section 45-852.01 provides a general rule that 95% of most stored water will be eligible for long-term storage credits, with the remaining 5% being considered a benefit to overall aquifer conditions. Exceptions to this general rule include: (i) water that is recovered from the aquifer in the same year it was stored (no credits are earned); (ii) effluent stored in a managed underground storage facility that has “not been designated at the time of storage as a facility that could add value to a national park, national monument or state park” (in which case only 50% of the stored water will qualify for long-term storage credits); (iii) water stored at a groundwater savings facility where the operator fails to demonstrate that it reduced groundwater consumption on a gallon-for-gallon substitute basis for the quantity of in lieu water received (credits may be earned only to the extent groundwater consumption was actually reduced); and (iv) effluent stored in facilities other than managed storage facilities that are not designated as providing added value to a national park, national monument or state park (which qualifies for 100% credit). <i>Id.</i>
Transfer of Credits	Once earned, long-term storage credits may be used to establish an assured water supply for industrial purposes, or for any other purpose for which the stored water could have been used prior to storage. In addition, long-term storage credits may be transferred “by grant, gift, sale, lease or exchange” to third parties. A.R.S. § 45-854.01(A). ADWR, however, may reject a transfer if the transferee would not have qualified to earn the long-term storage credits in the year they were earned. A.R.S. § 45-854.01(C).
	GROUNDWATER REGULATION OUTSIDE AMAs
Limited Regulation	Outside the State’s five existing AMAs, groundwater is subject to only limited regulation. Specifically, the Code provides only that “a person may:
	1. Withdraw and use groundwater for reasonable and beneficial use, except as provided in [the groundwater transportation statutes of Article 8.1].
	2. Transport groundwater pursuant to articles 8 and 8.1 [of the Groundwater Code].” A.R.S. § 45-453.
Transport Law	Article 8 of the Code provides general rules for, and limitations on, the transportation of groundwater within a groundwater basin or away from an AMA. Article 8.1 governs transportation of groundwater from outside an AMA into an AMA. These provisions substantially liberalized the right of landowners to pump groundwater and transport it away from the site of pumping for use in other locations. In all other respects, the common law doctrine of reasonable use applies to withdrawal and use of groundwater outside AMAs.
	Groundwater Transportation Provisions of the Groundwater Code
AMA Transport	Portions of the groundwater transportation provisions of Article 8 of the Code apply to groundwater transportation within an AMA. <i>See</i> A.R.S. § 45-541 through 45-543. The general rule within AMAs is that groundwater may be transported within a “sub-basin” of an AMA “without payment of damages.” A.R.S. § 45-541(A). In contrast, most permissible transportation of groundwater across sub-basin boundaries of an AMA, or transportation away from an AMA, will be subject to payment of damages. A.R.S. §§ 45-542, 45-543.

Arizona Groundwater

Outside AMAs

Exceptions Limited

Determining Damages

Damages Rules

Transport Into AMAs

Outside AMAs

Groundwater Supply

Other sections of Article 8 of the Code specifically apply to transportation of groundwater outside of AMAs. The general rules in such areas are contained in A.R.S. § 45-544(A):

- Groundwater may be transported “[w]ithin a subbasin of a groundwater basin or within a groundwater basin, if there are no subbasins, without payment of damages”
- Groundwater may be transported between subbasins of a groundwater basin “subject to payment of damages”
- Groundwater “may not be transported away from a groundwater basin.”

Subsections B through D of Section 45-544 provide limited exceptions to the ban on transportation of groundwater away from a basin, primarily to accommodate specific transportation activities that were occurring at the time the Section was enacted.

In all cases of transportation that are “subject to payment of damages” the rules for determining damages are set forth in A.R.S. § 45-545. This statute provides that “neither injury to nor impairment of the water supply of any landowner shall be presumed from the fact of transportation.” It also expressly requires the court to “consider all acts of the person transporting groundwater toward the mitigation of injury” when determining whether there has been injury and, if so, the extent of any damages. A.R.S. § 45-545(B).

Article 8.1 of the Groundwater Code governs withdrawals of groundwater in non-AMA groundwater basins for purposes of importation into an AMA. For such withdrawals, the general rule is that groundwater may not be imported into an AMA unless it is expressly permitted by a particular section of Article 8.1. *See* A.R.S. § 45-551(B). The remaining sections of Article 8.1 provide specific, generally narrow, exceptions to the prohibition against transportation into an AMA.

Adequate Water Supply Program

The only significant regulatory program administered by ADWR outside the State’s AMAs is the Adequate Water Supply program. This program is mandated by A.R.S. § 45-108 and is implemented through regulations promulgated by ADWR. The regulations are structured in a manner very similar to the Assured Water Supply program described above. As with that program, cities, towns and private water companies can become designated providers by demonstrating that they have sufficient water supplies physically, continuously and legally available for a 100-year period to meet current and committed demand. *See* A.R.S. § 45-108(C). Similarly, developers may request a water adequacy report for an individual subdivision that will not be supplied by a designated municipal provider.

There are two significant differences between the Assured Water Supply program and the Adequate Water Supply program. First, because the Adequate Water Supply program applies only outside AMAs, a designated provider or a developer seeking a water adequacy report for a subdivision may rely entirely on groundwater as the source of supply. There are no safe-yield management goals in these areas, so access to non-renewable groundwater supplies is not currently restricted. Second, a developer that fails to demonstrate an adequate water supply to the satisfaction of ADWR may nevertheless sell lots within the development, but must disclose the lack of adequate water supply in promotional materials for those sales. *See* A.R.S. § 45-108, § 32-2181(F).

CONCLUSION

Arizona has a unique mix of common law and statutory provisions governing the withdrawal and use of groundwater. The common law governs conflicting claims to groundwater supplies among neighboring landowners (the doctrine of reasonable use) and conflicts between surface water users and groundwater users (subflow issues). The statutory provisions authorize ADWR to regulate withdrawal and use of groundwater as a public resource. The extent of such regulation varies dramatically depending on whether the groundwater is used in one of the State’s five AMAs or in other parts of the State. In addition to regulating groundwater use, Arizona has enacted a number of statutory programs designed to augment and replenish groundwater supplies. Together, the common law and statutory and regulatory programs enable Arizona to rely on groundwater as an essential component of the State’s long-term water supplies.

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**Arizona
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Bill Staudenmaier joined Ryley Carlock & Applewhite in 1998. Mr. Staudenmaier's water law practice involves general stream adjudications, participation in negotiations for settlement of Indian water right claims, negotiation of contracts and leases for transfer of water and water rights, obtaining permits and approvals from state and federal regulatory agencies, and work concerning state and federal water resources legislation. Mr. Staudenmaier's environmental practice includes compliance counseling regarding state and federal hazardous and solid waste laws, legal advice concerning environmental release reporting and remediation requirements, due diligence counseling on environmental issues associated with real estate transactions, and legal advice concerning Aquifer Protection Permit and Clean Water Act issues. He received his B.S. from the University of Wisconsin, where he majored in Forestry and Soil Science, and his J.D. from the University of Michigan. Prior to joining Ryley Carlock & Applewhite, Bill was a Senior Attorney for Arizona Public Service Company from 1992 to 1998; Deputy Counsel for the Arizona Department of Water Resources from 1990 to 1992; an associate at Streich, Lang, Weeks & Cardon from 1988 to 1989 and law clerk to Judge Richard P. Matsch of the Federal District Court, District of Colorado, from 1987 to 1988.