



Supreme Court of Arizona,
 En Banc.

In re the GENERAL ADJUDICATION OF ALL
 RIGHTS TO USE WATER IN THE GILA RIVER
 SYSTEM AND SOURCE.

Nos. WC-90-0001-IR, WC-90-0002-IR,
 WC-90-0003-IR, WC-90-0004-IR, WC-90-0005-IR,
 WC-90-0006-IR, WC-90-0007-IR, WC-79-0001,
 WC-79-0002, WC-79-0003, WC-79-0004.
 Nov. 19, 1999.

In comprehensive general stream adjudication to determine extent and priority of rights of all persons to use water in river system and source, the Superior Court, Maricopa County, Nos. W-1 to W-4, adopted test to determine whether underground water known as subflow was appropriable, and issue was accepted for interlocutory review. The Supreme Court, [175 Ariz. 382, 857 P.2d 1236](#), vacated and remanded. On remand, the Superior Court, Stanley Z. Goodfarb, Retired Judge, made rulings regarding extent of federal reserved water rights in underground water, and questions were accepted for interlocutory review. The Supreme Court, [Fidel, J.](#), sitting by designation, held that: (1) federal reserved water rights doctrine applied not only to surface water but also to groundwater, and (2) holders of federal reserved water rights could invoke federal law to protect their groundwater from subsequent diversion to the extent such protection was necessary to fulfill the reserved rights, even if the holders would enjoy greater protection than holders of state law water rights.

Questions answered.

West Headnotes

[1] Water Law 405 **1097**

[405](#) Water Law
[405IV](#) Groundwater: Subterranean and Percolating Waters
[405k1093](#) Rights in Owner of Overlying Lands, in General

[405k1097](#) k. Limitation to reasonable amount and beneficial purpose. [Most Cited Cases](#)
 (Formerly 405k101)

Water Law 405 **1115**

[405](#) Water Law
[405IV](#) Groundwater: Subterranean and Percolating Waters
[405k1115](#) k. Liability for acts affecting natural percolation of waters in general. [Most Cited Cases](#)
 (Formerly 405k101)

The “reasonable use doctrine” permits an overlying landowner to capture as much groundwater as can reasonably be used upon the overlying land and relieves the landowner from liability for a resulting diminution of another landowner's water supply.

[2] Water Law 405 **1119**

[405](#) Water Law
[405IV](#) Groundwater: Subterranean and Percolating Waters
[405k1119](#) k. Conflicts as between hydrologically connected surface and groundwaters. [Most Cited Cases](#)
 (Formerly 405k101)

The notion of “subflow” marks a zone where water pumped from a well so appreciably diminishes the surface flow of a stream that it should be governed by the same law that governs the stream.

[3] Water Law 405 **1830**

[405](#) Water Law
[405XI](#) General Adjudication of All Riparian, Appropriative, Reserved, and Other Rights in Watercourse, Water Body, or Basin
[405k1830](#) k. Jurisdiction and venue. [Most Cited Cases](#)
 (Formerly 405k33)


State court had subject matter jurisdiction to adjudicate federal reserved water rights in a compre-

hensive general stream adjudication to determine extent and priority of rights of all persons to use water in river system and source. [43 U.S.C.A. § 666\(a\)](#); [A.R.S. §§ 45-251](#), subd. 4, [45-252](#), subd. A.

[4] Courts 106  **97(1)**


[106](#) Courts
[106II](#) Establishment, Organization, and Procedure
[106II\(G\)](#) Rules of Decision
[106k88](#) Previous Decisions as Controlling or as Precedents
[106k97](#) Decisions of United States Courts as Authority in State Courts
[106k97\(1\)](#) k. In general. [Most Cited Cases](#)

State courts must afford federal water rights claimants the benefit, when state and federal law conflict, of federal substantive law.

[5] Water Law 405  **1702**

[405](#) Water Law
[405VIII](#) Reserved Water Rights
[405k1701](#) Incident to Reservation or Withdrawal of Lands from Public Domain
[405k1702](#) k. In general. [Most Cited Cases](#)
(Formerly 405k2)

The federal reserved water rights doctrine or implied reservation doctrine applies not only to Indian reservations, but to other federal enclaves, such as national parks, forests, monuments, military bases, and wildlife preserves.

[6] Water Law 405  **1720**


[405](#) Water Law
[405VIII](#) Reserved Water Rights
[405k1719](#) Waters Reserved
[405k1720](#) k. In general. [Most Cited Cases](#)
(Formerly 405k2)

Federal reserved water rights law declines to differentiate surface and groundwater, and recognizes them as integral parts of a hydrologic cycle, when addressing the diversion of protected waters.

[7] Courts 106  **97(1)**


[106](#) Courts
[106II](#) Establishment, Organization, and Procedure
[106II\(G\)](#) Rules of Decision
[106k88](#) Previous Decisions as Controlling or as Precedents
[106k97](#) Decisions of United States Courts as Authority in State Courts
[106k97\(1\)](#) k. In general. [Most Cited Cases](#)

State court could not, purely out of deference to state water law, decline to extend the federal reserved water rights doctrine to groundwater, if such deference to state law would frustrate or impair the federal purpose of the reservation by defeating federal water rights.

[8] Courts 106  **97(1)**

[106](#) Courts
[106II](#) Establishment, Organization, and Procedure
[106II\(G\)](#) Rules of Decision
[106k88](#) Previous Decisions as Controlling or as Precedents
[106k97](#) Decisions of United States Courts as Authority in State Courts
[106k97\(1\)](#) k. In general. [Most Cited Cases](#)

Where federal rights are at issue, a state court may adopt state law as the rule of decision if to do so would not frustrate or impair a federal purpose.

[9] Courts 106  **97(1)**

[106](#) Courts
[106II](#) Establishment, Organization, and Procedure
[106II\(G\)](#) Rules of Decision
[106k88](#) Previous Decisions as Controlling or as Precedents
[106k97](#) Decisions of United States Courts as Authority in State Courts
[106k97\(1\)](#) k. In general. [Most Cited Cases](#)

State court could not decline to extend the federal reserved water rights doctrine to groundwater by deferring to state water law and giving holders of federal reserved water rights an equal right to pump ground-

water under reasonable use principle of state law, where users under state water rights had consumed far more groundwater than nature could replenish.

[10] Water Law 405 ☞1700

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1700](#) k. In general. [Most Cited Cases](#)
(Formerly 405k2)

Federal reserved water rights are by nature a preserve intended to continue through years.

[11] Water Law 405 ☞1721

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1719](#) Waters Reserved
[405k1721](#) k. Groundwater. [Most Cited Cases](#)
(Formerly 405k2)

Water Law 405 ☞1722

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1719](#) Waters Reserved
[405k1722](#) k. Natural watercourses, lakes, and ponds. [Most Cited Cases](#)
(Formerly 405k2)

Federal reserved water rights doctrine applies not only to surface water but also to groundwater.

[12] Water Law 405 ☞1721

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1719](#) Waters Reserved
[405k1721](#) k. Groundwater. [Most Cited Cases](#)
(Formerly 405k2)

A federal reserved right to groundwater may only be found where other waters are inadequate to accomplish the purpose of a reservation.

[13] Water Law 405 ☞1703

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1701](#) Incident to Reservation or Withdrawal of Lands from Public Domain
[405k1703](#) k. Waters necessary for primary purpose of federal reservation. [Most Cited Cases](#)
(Formerly 405k2)

Water Law 405 ☞1726

[405 Water Law](#)
[405VIII Reserved Water Rights](#)
[405k1725](#) Quantity of Water Reserved
[405k1726](#) k. In general. [Most Cited Cases](#)
(Formerly 405k2)

To determine the purpose of a federal water rights reservation and to determine the waters necessary to accomplish that purpose are inevitably fact-intensive inquiries that must be made on a reservation-by-reservation basis.

[14] Indians 209 ☞190

[209 Indians](#)
[209IV Real Property](#)
[209k188](#) Water Rights and Management
[209k190](#) k. Amount, measure, and allowable purposes. [Most Cited Cases](#)
(Formerly 209k16.5)

Indian tribes did not, as a matter of law, have a federal reserved water right to all of the waters appurtenant to their reservations.

[15] Water Law 405 ☞1097

[405 Water Law](#)
[405IV Groundwater: Subterranean and Percolating Waters](#)
[405k1093](#) Rights in Owner of Overlying Lands, in General
[405k1097](#) k. Limitation to reasonable amount and beneficial purpose. [Most Cited Cases](#)
(Formerly 405k142)

Water Law 405 ☞1589

[405](#) Water Law
[405VII](#) Appropriation of Waters
[405VII\(A\)](#) Nature and Elements in General
[405k1588](#) Nature and Extent of Rights
Acquired
[405k1589](#) k. In general. [Most Cited Cases](#)
(Formerly 405k142)

The common law of Arizona does not permit surface appropriators to protect their source of surface waters from depletion by groundwater pumping unless that pumping draws from the relatively narrow category of “subflow,” and more distant pumping within a common aquifer is governed by the relatively unfettered doctrine of reasonable use.

[16] Water Law 405 ↪ 1708

[405](#) Water Law
[405VIII](#) Reserved Water Rights
[405k1708](#) k. Effect of state law in general.
[Most Cited Cases](#)
(Formerly 405k2)

Water Law 405 ↪ 1718

[405](#) Water Law
[405VIII](#) Reserved Water Rights
[405k1718](#) k. Nature of rights, title, or interest in reserved water. [Most Cited Cases](#)
(Formerly 405k2)

Once a federal reserved water right to groundwater is established, the holder of the right may invoke federal law to protect its groundwater from subsequent diversion to the extent such protection is necessary to fulfill its reserved right, even if the holder will enjoy greater protection than holders of state law water rights.

**740 *412 Snell & Wilmer, L.L.P. By: Robert B. Hoffman, [Carlos D. Ronstadt](#), [Jeffrey W. Crockett](#), Phoenix, Attorneys for Magma Copper Company.

Grant Woods, Arizona Attorney General By: [Joseph E. Clifford](#), [Charlotte Benson](#), Phoenix, Attorneys for State of Arizona.

[Roderick G. McDougall](#), Phoenix City Attorney By:

[M. James Callahan](#), Katherine Ott Verburg, Phoenix, Attorneys for City of Phoenix.

Ulrich & Kessler By: [William H. Anger](#), Phoenix, Attorneys for Cities of Chandler, Glendale, Mesa, and Scottsdale.

Kimball & Curry, P.C. By: [Dalva L. Moellenberg](#), [D. Lee Decker](#), Phoenix, Attorneys for Apache Nitrogen Products, Inc., and Arizona Rock Products Association.

Arizona Public Service Company By: [Shiela B. Schmidt](#), Phoenix, Attorney for Arizona Public Service Company.

Ryley Carlock & Applewhite, P.A. By: [George Read Carlock](#), [Michael J. Brophy](#), [Sheryl A. Taylor](#), Phoenix, Attorneys for Arizona Public Service Company; Roosevelt Water Conservation District, and Aztec Land and Cattle Company, Limited.

Fennemore Craig By: [James W. Johnson](#), [Lauren J. Caster](#), Phoenix, Attorneys for Cyprus Christmas Mine Corporation, Cyprus Miami Mining Corporation, Cyprus Pima Mining Corporation, Cyprus Sierrita Corporation, Cyprus Twin Buttes Corporation, and Stone Container Corporation

Apker Apker Haggard & Kurtz By: [Burton M. Apker](#), [Gerri Apker Kurtz](#), Phoenix, Attorneys for ASARCO Incorporated.

**741 *413 Apker Apker Haggard & Kurtz By: [Jerry L. Haggard](#), [Cynthia M. Chandley](#), Phoenix, Attorneys for Phelps Dodge Corporation.

[Thomas J. Berning](#), Tucson City Attorney By: [Loretta Humphrey](#), Tucson, Attorneys for City of Tucson.

[John S. Schaper](#), Phoenix, Attorney for Buckeye Irrigation Company and Buckeye Water Conservation and Drainage District.

Douglas C. Nelson, P.C. By: [Douglas C. Nelson](#), Phoenix, Attorneys for Members of and Gila Bend-Dendora Valley Water Users Association.

Strickland & O'Hair, P.C. By: [Jennele Morris O'Hair](#), Tucson, Attorneys for Cities of Sierra Vista, Benson,

195 Ariz. 411, 989 P.2d 739, 316 Ariz. Adv. Rep. 68
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and Globe; Towns of Mammoth and Patagonia; Gila Valley Irrigation District; and Franklin Irrigation District.

Norling Perry Pierson & Kolsrud, P.L.C. By: [Mark S. Sifferman](#), Phoenix, Attorneys for Tenneco West, Inc. and Tenneco Arizona Properties Corporation.

Martinez & Curtis, P.C. By: [William P. Sullivan](#), Phoenix, Attorneys for Arlington Canal Company, Bella Vista Ranches Limited Partnership, Bella Vista Water Company, Inc., Cortaro-Marana Irrigation District, Pima County, Arizona, Cortaro Water Users' Association, Rigby Water Company, Town of Gilbert, and Valencia Water Company, Inc.

Brown & Brown By: David Albert Brown, St. Johns, Attorneys for Little Colorado Association.

Meyer Hendricks Victor Osborn & Maledon, P.A. By: [Lee H. Storey](#), Phoenix, Attorneys for City of Flagstaff and Rio Rico Properties, Inc.

[John G. Gliedge](#), Sedona, Attorney for Pinetop Woodland Irrigation Company, Woodland Irrigation Company, and Ponderosa Domestic Water Improvement District.

Burch & Cracchiolo, P.A. By: [Daryl Manhart](#), [Edwin C. Bull](#), Phoenix, Attorneys for Roosevelt Irrigation District.

Office of the Tempe City Attorney By: [David R. Merkel](#), [Karen S. Gaylord](#), Tempe, Attorneys for City of Tempe.

Salmon Lewis & Weldon, P.L.C. By: [M. Byron Lewis](#), [John B. Weldon, Jr.](#), [Stephen E. Crofton](#), Phoenix, Attorneys for Salt River Project Agricultural Improvement & Power District and Salt River Valley Water Users' Association.

Sparks & Siler, P.C. By: [Joe P. Sparks](#), [Kevin T. Tehan](#), [John H. Ryley](#), Scottsdale, Attorneys for San Carlos Apache Tribe, Tonto Apache Tribe, and Yavapai Apache Indian Tribe, Camp Verde Reservation.

Cox and Cox By: [Alfred S. Cox](#), [Alan J. Cox](#), [Emily A. Lewis](#), Phoenix, and Gila River Indian Community By: [Rodney B. Lewis](#), Chandler, Attorneys for Gila

River Indian Community and Silas Kisto.

United States Department of Justice By: [John C. Cruden](#), [David C. Shilton](#), [Gary B. Randall](#), [F. Patrick Barry](#), [Robert L. Klarquist](#), [Lois J. Schiffer](#), [Edward J. Shawaker](#), Washington, D.C., Attorneys for United States of America.

Sonosky Chambers Sachse & Endreson By: [Harry R. Sachse](#), [Reid Peyton Chambers](#), [Arthur Lazarus, Jr.](#), Washington, D.C., Attorneys for Hopi Tribe.

Greene Meyer & McElroy By: [Scott B. McElroy](#), Boulder Colorado, Attorneys for Navajo Nation.

Whiteing Thompson & White By: [Jeanne S. Whiteing](#), Boulder, Colorado, Attorneys for San Juan Southern Paiute Tribe.

Wayne D. Klump, Bowie, Pro Se.

OPINION

[FIDEL](#), Judge.

¶ 1 In the third of a series of interlocutory opinions in this comprehensive general stream adjudication, we address two questions: Do federal reserved water rights extend to groundwater (underground water) that is not subject to prior appropriation under Arizona law? Are federal reserved rights holders entitled to greater protection from groundwater pumping than are water users who hold only state law rights? We answer both questions in the affirmative.

*414 **742 I. PROCEDURAL HISTORY

¶ 2 The purpose of a comprehensive general stream adjudication is to determine “the nature, extent and relative priority of the water rights” of all who use the water of a “river system and source.” [Ariz.Rev.Stat. Ann. \(“A.R.S.”\) §§ 45-251\(2\), 252\(A\)](#); *see also* [43 U.S.C. § 666 \(1982\)](#). The underlying adjudication is a consolidated effort to achieve that purpose with respect to waters within the Upper Salt, Verde, Upper Gila, Lower Gila, Agua Fria, Upper Santa Cruz, and San Pedro watersheds. The Little Colorado watershed is the subject of a similar adjudication.

¶ 3 The pertinent waters within a “river system and source” are (1) those subject to prior appropriation and (2) those subject to claims based on federal law.

[A.R.S. § 45-251\(4\)](#). A substantial task is to determine the extent to which each category extends to hydrologically connected underground water pumped from wells. [In re the General Adjudication of All Rights to Use Water in the Gila River Sys. \(“Gila River II”\)](#), 175 Ariz. 382, 386, 857 P.2d 1236, 1240 (1993).

¶ 4 A detailed procedural history of this case may be found in [Gila River II](#), 175 Ariz. at 384-86, 857 P.2d at 1238-40, and [In the Matter of the Rights to the Use of the Gila River \(“Gila River I”\)](#), 171 Ariz. 230, 232-33, 830 P.2d 442, 444-45 (1992).^{FN1} It suffices here to state that in 1988 the trial court issued rulings on a number of questions concerning the relationship of groundwater and surface water. The trial court's ruling generated multiple petitions for interlocutory review, leading this court to accept six issues for review.^{FN2} We resolved issue 1 in [Gila River I](#), upholding procedures that the trial court established to make this massive case more manageable. [171 Ariz. at 243-44, 830 P.2d at 455-56](#). We resolved issue 2 in part in [Gila River II](#); there we affirmed the conclusion that water constituting “subflow” is the only underground water subject to appropriation under Arizona law, but disapproved the standard that the trial court adopted to distinguish subflow from non-appropriable “percolating groundwater,” remanding the standard to be reshaped after further hearings. [175 Ariz. at 392-93, 857 P.2d at 1246-47](#).

^{FN1}. For additional procedural history, see [Arizona v. San Carlos Apache Tribe](#), 463 U.S. 545, 558-60, 103 S.Ct. 3201, 77 L.Ed.2d 837 (1983), and [United States v. Superior Court](#), 144 Ariz. 265, 270-71, 697 P.2d 658, 663-64 (1985), which jointly uphold the jurisdiction of the Arizona courts to include federal parties in a comprehensive general stream adjudication.

^{FN2}. We defined the six issues as follows:

1. Do the procedures for filing and service of pleadings adopted by the trial court in its Pre-trial Order Number 1 comport with due process under the United States and Arizona Constitutions?
2. Did the trial court err in adopting its 50%/90 day test for determining whether underground water is “appropriable” under

[A.R.S. § 45-141](#)?

3. What is the appropriate standard to be applied in determining the amount of water reserved for federal lands?
4. Is non-appropriable groundwater subject to federal reserved rights?
5. Do federal reserved rights holders enjoy greater protection from groundwater pumping than holders of state law rights?
6. Must claims of conflicting water use or interference with water rights be resolved as part of the general adjudication?

¶ 5 After issuing [Gila River II](#), we interrupted consideration of the six issues and accepted special action jurisdiction to resolve a challenge to the constitutionality of Arizona statutes enacted in 1995 that attempted comprehensive procedural and substantive changes to Arizona's surface water law. [San Carlos Apache Tribe v. Super. Ct.](#), 193 Ariz. 195, 972 P.2d 179 (1999) (holding retroactive changes unconstitutional in substantial part). We then took jurisdiction of another special action to determine whether the trial court may consult *ex parte* with the Department of Water Resources in its statutory role as technical adviser to the court. See [San Carlos Apache Tribe v. Bolton](#), 194 Ariz. 68, 977 P.2d 790 (1999) (rejecting petition to disqualify trial court and director of Department). We now return to the original six issues and resolve issues 4 and 5.

II. ON GROUNDWATER, SURFACE WATER, SUBFLOW, AND THE RESERVED WATER RIGHTS DOCTRINE

¶ 6 The trial court held that federal “reserved rights” apply not only to surface water**743 *415 and subflow, appropriable categories under Arizona law, but also to non-appropriable groundwater. The court also held that federal reserved rights holders are entitled to protection from any off-reservation groundwater pumping that “significantly diminishes” the amount of water available to satisfy the purpose of the reservation. These rulings attribute more expansive water rights to federal claimants than to those asserting claims pursuant only to state law. To explain this aspect of the trial court's decision and to set the context for our discussion, we review some history and

terms.

A. Arizona's Bifurcated System of Water Rights

[1] ¶ 7 In *Gila River II*, we summarized the bifurcation of Arizona law respecting surface water and groundwater:

[R]ights associated with water found in lakes, ponds, and flowing streams-surface water-have been governed by the doctrine of prior appropriation.... On the other hand, underground water has been governed by the traditional common law notion that water percolating generally through the soil belongs to the overlying landowner, as limited by the doctrine of reasonable use.^{FN3}

^{FN3}. The doctrine of reasonable use permits an overlying landowner to capture as much groundwater as can reasonably be used upon the overlying land and relieves the landowner from liability for a resulting diminution of another landowner's water supply. See *Bristor v. Cheatham*, 75 Ariz. 227, 237-38, 255 P.2d 173, 180 (1953); see generally R. Beck, 1 WATERS & WATER RIGHTS §§ 4.01 at 66, 4.05(c) at 72 (1991 & Supp.1998).

[175 Ariz. at 386, 857 P.2d at 1240.](#)

[2] ¶ 8 Arizona does not entirely confine the doctrine of prior appropriation to surface waters. Our courts have extended prior appropriation to a category known as “subflow,” historically defined 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.” *Id.* at 387, 857 P.2d at 1241 (quoting *Maricopa County Mun. Water Conserv. Dist. No. 1 v. Southwest Cotton Co.*, 39 Ariz. 65, 96, 4 P.2d 369, 380 (1931) (“*Southwest Cotton*”)). The notion of “subflow” is significant in Arizona law, for it serves to mark a zone where water pumped from a well so appreciably diminishes the surface flow of a stream that it should be governed by the same law that governs the stream. *Id.* at 96-97, 4 P.2d at 380-81.

¶ 9 Yet the notion of subflow is an artifice, as we acknowledged in *Gila River II*, that rests on a hydrological misconception. [175 Ariz. at 389, 857 P.2d at 1243.](#) To pump well water from “lands under or im-

mediately adjacent to a stream” is not, we now know, the only pumping that may significantly diminish surface flow. The hydrological connection of groundwater and surface water is sometimes such that groundwater pumped more distantly within an aquifer may have comparable effect. Leshy and Belanger ^{FN4} explain:

^{FN4}. In *Gila River II*, we referred those seeking a detailed history of the evolution of Arizona water law to John D. Leshy & James Belanger, ARIZONA LAW WHERE GROUND AND SURFACE WATER MEET, 20 Ariz. St. L.J. 657 (1988).

When water is pumped from an aquifer by means of a well, it creates what is known as a “cone of depression.” This is caused by the groundwater in the aquifer moving toward the well. If the material in the aquifer has a high transmissivity value, the cone of depression will be wide and shallow. If, on the other hand, the aquifer does not easily transmit water, the cone of depression will be steep and narrow. If water is pumped continuously from the well, the cone of depression will become larger. If the water table is close enough to the earth's surface to allow this cone to cut into a surface stream, water from the stream would directly infiltrate into the ground, following the slope of the cone of depression until it reached the well. Even if the cone did not intersect the stream directly, it could affect the amount of water in the stream by intercepting water that would otherwise migrate toward the stream. This would cause less water to be available in the stream bed. If water were removed by pumping from a well and none ~~**744~~ ~~*416~~ were reintroduced, the water table would decline. If several wells were pumping, there would be a more rapid decline. Any time the rate of water withdrawn from an aquifer exceeds the rate of recharge, the water table will decline.

Leshy & Belanger, 20 Ariz. St. L.J. at 663-64.

¶ 10 Conforming their law to hydrological reality, most prior appropriation jurisdictions by now have abandoned the bifurcated treatment of ground and surface waters and undertaken unitary management of water supplies. *Id.* at 659-60. In *Gila River II*, however, we declined to do so, explaining:

[I]t is too late to change or overrule [*Southwest*

Cotton]... More than six decades have passed since *Southwest Cotton* was decided. The Arizona legislature has erected statutory frameworks for regulating surface water and groundwater based on *Southwest Cotton*. Arizona's agricultural, industrial, mining, and urban interests have accommodated themselves to those frameworks. *Southwest Cotton* has been part of the constant backdrop for vast investments, the founding and growth of towns and cities, and the lives of our people.

[Gila River II, 175 Ariz. at 389, 857 P.2d at 1243.](#)

Limiting ourselves to “interpreting *Southwest Cotton*, not refining, revising, correcting, or improving it,” we “reaffirm[ed] *Southwest Cotton*'s narrow concept of subflow” and directed the trial court to devise a subflow standard on remand that “turns on whether the well is pumping water that is more closely associated with the stream than with the surrounding alluvium.” [Id. at 389-93, 857 P.2d at 1243-47.](#)

B. All Water Appropriable and All Water Subject to Claims Based Upon Federal Law

¶ 11 A subflow standard, once it has been established, will serve to identify well-users who pump water subject to prior appropriation. But this adjudication is not limited to water subject to prior appropriation; it extends also to water subject to claims based on federal law. **An adjudication such as this cannot achieve its comprehensive purpose without quantifying and prioritizing federal, as well as state law, claims.**

Since there is not enough water to meet everyone's demands, a determination of priorities and a quantification of the water rights accompanying those priorities must be made. Obviously, such a task can be accomplished only in a single proceeding in which all substantial claimants are before the court so that all claims may be examined, priorities determined, and allocations made.

See [United States v. Super. Ct., 144 Ariz. 265, 270, 697 P.2d 658, 663 \(1985\).](#)

[3] ¶ 12 Approximately two-thirds of the land in Arizona is federally held, much of it in trust for Indian tribes. See ARIZONA STATISTICAL ABSTRACT 173-177 (1993 ed.). The McCarran Amendment permits us to include federal claimants in the adjudication, for it permits the United States to participate in

state court proceedings that comprehensively adjudicate “rights to the use of water of a river system or other source.” [43 U.S.C. § 666\(a\)](#). In conformity with the McCarran Amendment, our general adjudication statute, [A.R.S. § 45-252\(A\)](#), authorizes determination of “the nature, extent and relative priority of the water rights of all persons in the river system and source.” And [A.R.S. § 45-251\(4\)](#), as we have indicated, defines “river system and source” to include not only appropriable water, but “all water subject to claims based upon federal law.” [FN5](#)

[FN5](#). The City of Phoenix argues that our general adjudication statute permits us to adjudicate federal water claims only to the extent that they are claims to water that is appropriable under state law and, thus, that we lack jurisdiction to consider whether federal reserved rights extend to non-appropriable groundwater. We summarily reject this argument because it is contrary to the plain, conjunctive definitional language of [A.R.S. § 45-251\(4\)](#) and because such an interpretation would deprive this adjudication of the comprehensive quality that our general adjudication statute was intended to provide.

[4] ¶ 13 The rub is that, in order to adjudicate and quantify water rights based upon federal law, the Arizona courts must afford federal claimants the benefit, when state and federal law conflict, of federal substantive law. See [Arizona v. San Carlos Apache Tribe, 463 U.S. 545, 571, 103 S.Ct. 3201, 77 L.Ed.2d 837 \(1983\)](#) (state courts must apply federal substantive law to measure federal rights in state adjudication); accord [United States v. Super. Ct., 144 Ariz. at 276-77, 697 P.2d at 669-70](#). And the particular issues that we now consider arise pursuant to a doctrine of federal substantive law known variously as the “reserved water rights,” the “reserved rights,” or the “implied reservation” doctrine.

[5] ¶ 14 The reserved water rights doctrine provides:

[W]hen the Federal Government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reserva-

tion. In so doing the United States acquires a reserved right in unappropriated water which vests on the date of the reservation and is superior to the rights of future appropriators.

Cappaert v. United States, 426 U.S. 128, 138, 96 S.Ct. 2062, 48 L.Ed.2d 523 (1976). The doctrine applies not only to Indian reservations, but to other federal enclaves, such as national parks, forests, monuments, military bases, and wildlife preserves. *Id.* at 138-39, 96 S.Ct. 2062; Arizona v. California, 373 U.S. 546, 601, 83 S.Ct. 1468, 10 L.Ed.2d 542 (1963).

III. DO FEDERAL RESERVED RIGHTS EXTEND TO GROUNDWATER?

¶ 15 Moving from background to foreground, we consider the trial court's conclusion that the reserved water rights of federal claimants-when measured by federal substantive law-are not constrained by Arizona's bifurcated treatment of surface water and groundwater. **According to the trial court, federal law establishes a reserved right to groundwater, if and to the extent that groundwater may be necessary to accomplish the purpose of a federal reservation.**

¶ 16 The state law parties respond that the Supreme Court has never applied reserved rights to groundwater and that this court, if not obliged to do so, should decline to apply a federal doctrine so disjunctive to established doctrines of our state. In support of this argument, the state law parties cite the example of In re All Rights to Use Water in the Big Horn River System, 753 P.2d 76 (Wyo.1988). In that general stream adjudication, the Supreme Court of Wyoming recognized that “[t]he logic which supports a reservation of surface water to fulfill the purpose of the reservation also supports reservation of groundwater.” *Id.* at 99. Yet the court declined to find a reserved right to groundwater, stating in explanation only that it had been cited no previous decision which did so. *Id.* at 99-100.^{FN6}

^{FN6}. Some recorded decisions have, in fact, addressed the question, though their analysis was relatively terse. See Tweedy v. Texas Co., 286 F.Supp. 383, 385 (D.Mont.1968) (“the same implications” that support a reservation of surface waters in arid lands “would apply to underground waters as well”); Gila River Pima-Maricopa Indian Community v. United States, 9 Cl.Ct. 660,

699 (1986) (“Ground water under the Gila River reservation impliedly was reserved for the Indians.”).

¶ 17 We can appreciate the hesitation of the *Big Horn* court to break new ground, but we do not find its reasoning persuasive. That no previous court has come to grips with an issue does not relieve a present court, fairly confronted with the issue, of the obligation to do so. Moreover, as the *Big Horn* court acknowledged, we do not write on a blank slate.

¶ 18 The reserved rights doctrine derives from Winters v. United States, 207 U.S. 564, 28 S.Ct. 207, 52 L.Ed. 340 (1908). There, the United States sued to enjoin upstream settlers in Montana from constructing or maintaining dams and reservoirs that diverted Milk River waters from flowing to the Fort Belknap Indian Reservation. *Id.* at 565, 28 S.Ct. 207. Although the reservation was created in 1888, before the upstream settlers arrived, the settlers claimed priority under Montana's law of prior appropriation, asserting that their diversion and beneficial use preceded all but a minor appropriation of waters for reservation use. *Id.* at 568-69, 28 S.Ct. 207. The Supreme Court rejected the **746 *418 settlers' argument. Observing that “[t]he power of the government to reserve the waters and exempt them from appropriation under the state laws is not denied, and could not be,” the Court concluded that, in setting aside land for a reservation, the government had implicitly reserved sufficient water to accomplish the reservation's purpose. *Id.* at 577, 28 S.Ct. 207.

¶ 19 In *Cappaert*, the Court applied the reserved rights doctrine in a case that turned on the hydrological connection of surface water and groundwater. There, upon application by the United States, a federal district court had issued, and the Ninth Circuit had affirmed, an injunction restricting pumping from wells drilled on private ranch land bordering the Devil's Hole National Monument. The wells drew water from the same underground source as a pool within the monument where lived an endangered breed of fish. One purpose of the monument was to preserve the pool and its rare fish. *Id.* at 141, 96 S.Ct. 2062. Upon evidence that pumping from the wells had lowered the pool's surface to a level that inhibited the spawning of the fish, the Supreme Court affirmed the district court's injunction, which restricted the ranch's pumping to the extent necessary to maintain the pool at a

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water level that sufficed to support the fish. *Id.*

¶ 20 Although the Ninth Circuit, in its *Cappaert* opinion, expressly determined that the reserved rights doctrine extends to groundwater,^{FN7} the Supreme Court found it unnecessary to reach that question, explaining that the water in the pool was surface water. *Cappaert*, 426 U.S. at 142, 96 S.Ct. 2062. Yet upon evidence that “federal water rights were being depleted because ... the ‘[g]roundwater and surface water are physically interrelated as integral parts of the hydrologic cycle,’ ” the Court held that “the United States can protect its water from subsequent diversion, whether the diversion is of surface or groundwater.” *Id.* at 142-43, 96 S.Ct. 2062 (quoting C. Corker, *Groundwater Law, Management and Administration*, National Water Commission Legal Study No. 6, p. xxiv (1971)).

[FN7. See *United States v. Cappaert*, 508 F.2d 313, 317 \(9th Cir.1974\).](#)

¶ 21 In *Cappaert*, as before, the Supreme Court left the question of a reserved right to groundwater unresolved. The Court's decisions, however, provide guideposts toward our holding that such a right exists.

¶ 22 We find one guidepost in *Winters*, where the Court stressed that the arid lands of the Fort Belknap Reservation could not be made “inhabitable and capable of growing crops” without an implicit reservation of Milk River waters. *Winters*, 207 U.S. at 569, 28 S.Ct. 207. We find a similar guidepost in *Arizona v. California*, where the Court declared it “impossible to believe” that those who created the Colorado River Indian Reservation “were unaware that most of the lands were of the desert kind-hot, scorching sands-and that water from the [Colorado River and its tributaries] would be essential to the life of the Indian people and to the animals they hunted and the crops they raised.” *Arizona v. California*, 373 U.S. at 599, 83 S.Ct. 1468. The reservations considered in those cases depended for their water on perennial streams. But some reservations lack perennial streams and depend for present or future survival substantially or entirely upon pumping of underground water. We find it no more thinkable in the latter circumstance than in the former that the United States reserved land for habitation without reserving the water necessary to sustain life.

[6] ¶ 23 We find another guidepost to decision in

the Supreme Court's association of surface and groundwater in *Cappaert* as “integral parts of the hydrologic cycle.” *Cappaert*, 426 U.S. at 142, 96 S.Ct. 2062. True, the Court identified the waters to be protected as the surface waters of the pool in Devil's Hole. But in contrast to prior cases where the use to be enjoined was an upstream diversion of surface waters, in *Cappaert* the use to be enjoined was a pumping of groundwater from beneath adjoining land. The Court declined to differentiate one means of diversion from another. Instead, the Court held that “the United States can protect its water from subsequent diversion, whether the diversion is of surface or groundwater.” *Id.* at 143, 96 S.Ct. 2062. **747 *419 While *Cappaert* bears most directly upon our discussion of issue 5 in Part IV of this opinion, we find it helpful to our resolution of the present issue as well. That federal reserved rights law declines to differentiate surface and groundwater-that it recognizes them as integral parts of a hydrologic cycle-when addressing the diversion of protected waters suggests that federal reserved rights law would similarly decline to differentiate surface and groundwater when identifying the water to be protected.

¶ 24 In summary, the cases we have cited lead us to conclude that if the United States implicitly intended, when it established reservations, to reserve sufficient unappropriated water to meet the reservations' needs, it must have intended that reservation of water to come from whatever particular sources each reservation had at hand. The significant question for the purpose of the reserved rights doctrine is not whether the water runs above or below the ground but whether it is necessary to accomplish the purpose of the reservation.

[7][8] ¶ 25 The state law parties argue, however, that even if the reserved rights doctrine applies equally in principle to groundwater as to surface water, we should decline to extend the doctrine to groundwater out of deference to state water law. Where federal rights are at issue, a state court may adopt state law as the rule of decision if to do so would not frustrate or impair a federal purpose. See *United States v. Kimbell Foods, Inc.*, 440 U.S. 715, 728-29, 99 S.Ct. 1448, 59 L.Ed.2d 711 (1979). Such is not the case here. To the contrary, the Supreme Court has defined the reserved rights doctrine as an exception to Congress's deference to state water law. See *United States v. New Mexico*, 438 U.S. 696, 714, 98 S.Ct. 3012, 57 L.Ed.2d 1052

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(1978); accord Cappaert, 426 U.S. at 145, 96 S.Ct. 2062; see also United States v. Rio Grande Dam & Irrig. Co., 174 U.S. 690, 703, 19 S.Ct. 770, 43 L.Ed. 1136 (1899) (state law cannot be applied to destroy the federal government's right to water on its lands).^{FN8}

^{FN8}. As evidence of the deference that the federal government traditionally accords state water law, the state law parties point to statutes such as the 1877 Desert Lands Act, in which Congress effected “a severance of all waters upon the public domain, not theretofore appropriated, from the land itself,” and reserved the waters “for the use of the public under the laws of the states and territories.” California Oregon Power Co. v. Beaver Portland Cement Co., 295 U.S. 142, 158, 162, 55 S.Ct. 725, 79 L.Ed. 1356 (1935). The Supreme Court has held, however, “that the Desert Land Act does not apply to water rights on federally reserved land.” Cappaert, 426 U.S. at 144, 96 S.Ct. 2062 (citing FPC v. Oregon, 349 U.S. 435, 448, 75 S.Ct. 832, 99 L.Ed. 1215 (1955)).

¶ 26 In Winters, the Supreme Court acknowledged the extensive cultivation, construction, and development that Montana settlers had undertaken in reliance upon diversions of water accomplished pursuant to state law. 207 U.S. at 569-70, 28 S.Ct. 207. Had the Court deferred to state law, the settlers would have prevailed. Instead, the Court concluded that the United States had exercised its power “to reserve the waters and exempt them from appropriation under the state laws.” Id. at 577, 28 S.Ct. 207. In Cappaert, similarly, the Court acknowledged the extensive investment that the ranch land parties had made and the substantial employment generated by their wells. 426 U.S. at 133, 96 S.Ct. 2062. The State Engineer, applying state law, had permitted the pumping to continue, finding in part that further economic development served the public interest. Id. at 134-35, 96 S.Ct. 2062. The Supreme Court, however, concluded that “determination of reserved water rights is not governed by state law but derives from the federal purpose of the reservation.” Id. at 145, 96 S.Ct. 2062.

¶ 27 It is apparent from the case law that we may not withhold application of the reserved rights doctrine purely out of deference to state law. Rather, we may not defer to state law where to do so would defeat

federal water rights.

¶ 28 The state law parties next argue, however, that deference to state law in this case would not defeat federal water rights. Specifically, they maintain that there has never been a need to reserve groundwater in a state that provides all overlying landowners an equal right to pump as much **748 *420 groundwater as they can put to reasonable use upon their land.^{FN9} Cf. Wilson v. Omaha Indian Tribe, 442 U.S. 653, 674, 99 S.Ct. 2529, 61 L.Ed.2d 153 (1979) (court may borrow state law as rule of decision where under the circumstances there is no reason for beneficiaries of a federal right to have a privileged position over others).

^{FN9}. See *supra* note 3.

¶ 29 This argument, however, overlooks that federal reserved water rights are by nature a preserve intended to “continue[] through years.” See Winters, 207 U.S. at 577, 28 S.Ct. 207. In Arizona v. California, the Supreme Court affirmed that an implied reservation includes sufficient waters “to satisfy the future as well as the present needs of the Indian Reservations.” Arizona v. California, 373 U.S. at 600, 83 S.Ct. 1468. The Court added that the reservation of waters applies to the “future requirements” of other types of federal reservation as well. Id. at 601, 83 S.Ct. 1468. A theoretically equal right to pump groundwater, in contrast to a *reserved* right, would not protect a federal reservation from a total future depletion of its underlying aquifer by off-reservation pumpers. Cf. Washington v. Washington State Com. Passenger Fishing Vessel Ass'n, 443 U.S. 658, 676 n. 22, 99 S.Ct. 3055, 61 L.Ed.2d 823 (1979) (“[I]n light of the far superior numbers, capital resources, and technology of the non-Indians, the concept of the Indians’ ‘equal opportunity’ to take advantage of a scarce resource is likely in practice to mean that the Indians’ ‘right of taking fish’ will net them virtually no catch at all.”)

¶ 30 Under the “reasonable use” doctrine, Arizona has consumed far more groundwater than nature can replenish. See ARIZONA DEPT WATER RESOURCES, ARIZONA WATER RESOURCES ASSESSMENT: VOL. 1, INVENTORY AND ANALYSIS 9 (1994); don & Terence W. Thompson, The 1980 Arizona Groundwater Management Code, 1980 Ariz. St. L.J. 621, 623. The Department of Water Resources presented evidence to the trial court in this

case of streams in transition from perennial to intermittent within the San Pedro and Upper San Pedro watersheds, of others nearing an ephemeral character, and of others in geographical “retreat.” See ARIZONA DEPT WATER RESOURCES, GILA RIVER SYSTEM GROUNDWATER-SURFACE WATER INTERACTION STUDY 31-32 (1987). Within the Lower Gila River watershed, groundwater tables have been so lowered as to sever the connection between ground and surface water. See Leshy & Belanger, *supra*, at 665-66. Some Indian reservations have been entirely “dewatered” by off-reservation pumping. See *Gila River Pima-Maricopa Indian Community v. United States*, 9 Cl.Ct. 660, 665-66 (1986) (federal inaction and lack of tribal resources have enabled off-reservation developers to pump aquifers underlying some Indian reservations dry before the tribes could exercise their opportunity to pump groundwater). We therefore cannot conclude that deference to Arizona's law-and to the opportunity it extends all landholders to pump as much groundwater as they can reasonably use-would adequately serve to protect federal rights.

[11][12][13] ¶ 31 For the foregoing reasons, we hold that the trial court correctly determined that the federal reserved water rights doctrine applies not only to surface water but to groundwater. We decide this issue in the abstract at this time as a necessary step in determining the scope of interests to be encompassed by this adjudication. We do not, however, decide that any particular federal reservation, Indian or otherwise, has a reserved right to groundwater. A reserved right to groundwater may only be found where other waters are inadequate to accomplish the purpose of a reservation. To determine the purpose of a reservation and to determine the waters necessary to accomplish that purpose are inevitably fact-intensive inquiries that must be made on a reservation-by-reservation basis. See *United States v. New Mexico*, 438 U.S. at 700, 98 S.Ct. 3012.

[14] ¶ 32 Likewise, we do not now attempt to impose a standard upon the trial court for determining the purpose of any reservation. That standard, in our judgment, is not well-suited to abstract declaration**749 *421 and should instead emerge from testing in the solid context of the facts.^{FN10}

^{FN10}. Accordingly, we reject the Arizona Tribes' assertion that the Indian tribes have a

reserved right to all of the waters appurtenant to their reservations. In determining Indian treaty rights, the Supreme Court has rejected tribal claims to an “untrammelled right” to exploit scarce natural resources. *Washington v. Washington State Com. Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 683, 99 S.Ct. 3055, 61 L.Ed.2d 823 (1979); see also *Puyallup Tribe v. Washington*, 433 U.S. 165, 175, 97 S.Ct. 2616, 53 L.Ed.2d 667 (1977).

IV. PROTECTION Against Off-RESERVATION PUMPING

¶ 33 Next is the question what level of protection federal reserved right holders may claim against groundwater pumping that depletes their water supply. Are they limited, as the state law parties contend, to such protection as state law offers to state and private appropriators, or did the trial court correctly determine that the federal reserved right entails whatever broader protection may be necessary to maintain sufficient water to accomplish the purpose of a reservation?

[15] ¶ 34 We answer this question first with respect to federal reservations that enjoy a reserved right to surface waters. As we have indicated in previous discussion, the common law of Arizona does not permit surface appropriators to protect their source of surface waters from depletion by groundwater pumping unless that pumping draws from the relatively narrow category of “subflow.” See *supra* ¶¶ 8-10. More distant pumping within a common aquifer is governed by the relatively unfettered doctrine of reasonable use. See *supra* n. 3. Thus, for example, if *Cappaert* had arisen in Arizona, the application of state law might have precluded any restriction of adjoining pumping and have permitted Devil's Hole to be pumped dry.

¶ 35 The Salt River Project points out, however, that the standard for defining subflow awaits our further review and may conceivably be set sufficiently broadly to protect the surface water rights of some or all of the federal reservations.^{FN11} We acknowledge that possibility, but at this stage of the adjudication we must provide for the contrary possibility as well. The question before us is not whether any particular reservation is *now* entitled to broader protection than state law provides.^{FN12} The question is rather whether a federal reservation may invoke broader protection than state law provides if state law turns out to be

inadequate to preserve the waters necessary to accomplish the purpose of the reservation.^{FN13}

[FN11.](#) The Salt River Project contends for a broader standard of subflow than do other state law parties.

[FN12.](#) We thus reject as premature the argument of the Arizona Tribes that we should immediately enjoin pumping that is depleting water beneath reservations. Until federal rights are quantified, it cannot be determined which if any of the tribes are entitled to such relief.

[FN13.](#) We similarly approach the state law parties' argument that federal reserved rights holders may be adequately protected against groundwater depletion by the 1980 Groundwater Management Code, which restricts application of the reasonable use doctrine and mandates conservation measures in some parts of Arizona. For example, within "active management areas," it prevents drilling of new wells or increased pumping, and requires permits for changes in use. See [A.R.S. § 45-411 et seq.](#) (West 1994 & Supp.1998). Reservations within active management areas will receive some degree of protection from the Code; reservations outside such areas will not. Whether any particular reservation receives adequate protection of its reserved water rights through the combination of Arizona's common and statutory law remains to be determined.

¶ 36 In our view, *Cappaert* provides an explicit answer to that question. First, *Cappaert* tells us that "determination of reserved water rights is not governed by state law but derives from the federal purpose of the reservation." [426 U.S. at 145, 96 S.Ct. 2062.](#) Second, it tells us that "the United States can protect its water from subsequent diversion, whether the diversion is of surface or groundwater." [Cappaert, 426 U.S. at 143, 96 S.Ct. 2062.](#)

[\[16\]](#) ¶ 37 What *Cappaert* holds with respect to the protection of surface waters, our discussion in Part III enables us to apply to **750 *422 the protection of groundwater as well. We have held that the federal

reserved right extends to groundwater when groundwater is necessary to accomplish the purpose of a federal reservation. We similarly hold that once a federal reservation establishes a reserved right to groundwater, it may invoke federal law to protect its groundwater from subsequent diversion to the extent such protection is necessary to fulfill its reserved right.

¶ 38 We thus affirm the trial court's conclusion that federal reserved rights holders enjoy greater protection from groundwater pumping than do holders of state law rights. We do not, however, read the case law to require a zero-impact standard of protection for federal reserved rights. The Supreme Court has repeatedly acknowledged that the reserved rights doctrine "reserves only that amount of water necessary to fulfill the purpose of the reservation, no more." [Cappaert, 426 U.S. at 141, 96 S.Ct. 2062;](#) see also [United States v. New Mexico, 438 U.S. at 700 n. 4, 98 S.Ct. 3012, 57 L.Ed.2d 1052 \(1978\).](#) In *Cappaert*, the Court affirmed an injunction "appropriately tailored ... to minimal need, curtailing pumping only to the extent necessary to preserve an adequate water level at Devil's Hole." *Id.* at 141, [96 S.Ct. 2062.](#) If injunctions should ultimately prove necessary in this case, they shall likewise be appropriately tailored to minimal need.

¶ 39 In Part III we declined in the abstract to declare a standard for determining the purpose of a reservation. We here decline in the abstract to define how imminent a threat to a reservation's essential waters must be in order to warrant injunctive relief. The latter standard, like the former, should be grounded in the bedrock of the facts.

V. CONCLUSION

¶ 40 In *United States v. Superior Court* we wrote, "In the scheme of priorities, the claims of the federal government ... and of the Indians rank high. While the amount of water actually used by these entities may have been negligible until recent times, the magnitude of the right to use water on these lands has been far from negligible." [144 Ariz. at 270, 697 P.2d at 663.](#) Today we add some greater definition to the rights we then described.

¶ 41 We recognize that our determination that reserved water rights may encompass groundwater threatens to disrupt the assumptions that underlie state law uses. State law parties may question how our

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present holding may be squared with our decision in *Gila River II* to retain Arizona's traditional bifurcation of the law of surface and groundwater. We are no less cognizant now than when we decided *Gila River II* that Arizona's agricultural, industrial, mining, and urban interests have accommodated themselves to the framework of *Southwest Cotton*. [Gila River II, 175 Ariz. at 389, 857 P.2d at 1243](#). See *supra* ¶ 10. Yet there long has loomed the need-sometimes noted, sometimes wished away-for those same interests also to accommodate themselves to the water claims of the vast federal land holdings that surround them. See [Gila River I, 144 Ariz. at 270, 697 P.2d at 663](#). For state law purposes in *Gila River II*, we found reason to retain a bifurcated framework despite the hydrological misconceptions upon which it rested. But federal law does not permit us that option in deciding the extent of federal reserved rights. As Leshy and Belanger wrote in summary of *Cappaert*, "For federal law, the question is one of hydrology, not legal compartmentalization." 20 Ariz. St. L.J. at 734.

¶ 42 We do not underestimate the burden that the State of Arizona will face in accommodating federal reserved water rights within its water resource management. Nor do we underestimate the burden that the trial court will face in adjudicating the extent and relative priority of such rights. Unless there is a comprehensive settlement, however, we must heed the lesson that "the best way out is always through." [FN14](#) To solve the conflict and uncertainty that reserved rights engender, we must quantify them, for we may not ignore them. See [Colville Confederated Tribes v. Walton, 647 F.2d 42, 48 \(9th Cir.1981\)](#); see also Mikel L. Moore & John B. Weldon, Jr., *General Water-Rights Adjudication in Arizona: Yesterday, Today and **751 *423 Tomorrow*, 27 ARIZ. L.REV. 709, 725 (1985) (the overarching purpose of the general stream adjudication statute is to provide the finality and certainty that can only be achieved through a determination of all claims to water within the basin).

[FN14](#). R. Frost, *A Servant to Servants* in COMPLETE POEMS OF ROBERT FROST 83 (Holt, Rinehart and Winston ed.1964)

¶ 43 We answer issues 4 and 5 as follows: Federal reserved rights extend to groundwater to the extent groundwater is necessary to accomplish the purpose of a reservation. Holders of federal reserved rights enjoy greater protection from groundwater pumping than do

holders of state law rights to the extent that greater protection may be necessary to maintain sufficient water to accomplish the purpose of a reservation.

CONCURRING: [THOMAS A. ZLAKET](#), Chief Justice, [STANLEY G. FELDMAN](#), Justice, [WILLIAM E. DRUKE](#), Chief Judge, and [JOHN PELANDER](#), Judge.

Vice Chief Justice [CHARLES E. JONES](#) and Justices [FREDERICK J. MARTONE](#) and [RUTH V. MCGREGOR](#) recused themselves; pursuant to Ariz. Const. art. VI, [3](#), Judge [NOEL A. FIDEL](#) of Division One, Arizona Court of Appeals, Chief Judge [WILLIAM E. DRUKE](#) and Judge JOHN PELANDER of Division Two, Arizona Court of Appeals, were designated to sit in their stead.

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