New Era of Arizona Water Challenges

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I. INTRODUCTION

Arizona is now entering a new era of water challenges prompted by the need to consider, confront, and find solutions to predicted water supply, and demand imbalances in the future. This paper will discuss (1) studies predicting water supply limitations, (2) possible sources of augmentation of Arizona's water supply discussed in those studies, and (3) significant legal and political challenges to overcome in finding solutions to supply and demand imbalances.

II. WATER SUPPLY LIMITATIONS

Two recent studies, one by the United States Bureau of Reclamation and another by Arizona's Water Resources Development Commission, have focused on the future of water supply and demand issues which could have a significant impact on Arizona's future water supply.

A. U.S. Bureau of Reclamation's Colorado River Basin Water Supply and Demand Study

The Colorado River Basin (Basin) spans parts of the seven states of Arizona, California, Colorado, New Mexico, Nevada, Utah, and Wyoming (Basin States) and is considered to be one of the most critical water sources in the West. The Colorado River Basin Water Supply and Demand Study was funded through the Bureau of Reclamation's Basin Study Program and cost-shared by agencies representing the Basin States. The study began in January 2010 and was released on Dec. 12, 2012. It shows significant

water supply shortfalls within the Basin in the next 50 years and concludes that by 2060, and in some cases in 2025, future demands on the Colorado River may exceed the available supplies. As a result of political compromises to obtain federal legislation to build the Central Arizona Project, Arizona will be the first to suffer the predicted future shortages on the Colorado River.

B. Arizona's Water Resources Development Commission Study

In 2010 the Arizona Legislature passed a law establishing the Water Resources Development Commission (WRDC), which was given the task of assessing Arizona's demand for water and the supplies available to meet those demands for the next 25, 50, and 100 years. It consists of 17 members who were selected regarding their knowledge relating to a variety of water resource and water management issues, and they provide representation for a regional and geographical cross-section of the State of Arizona.

The WRDC released its report on the future availability of water supplies on Oct. 1, 2011. The study concluded: "It is now known that portions of the state have sufficient supplies developed to meet future needs, while other areas within the state will require development of additional supplies for the future. However, due to variability in Arizona's geology, climate, precipitation patterns, water use patterns, population growth and land ownership, evaluation of the issues and development of comprehensive solutions is extremely difficult. Arizona must develop a broad portfolio of solutions to meet the myriad of challenges that are inherent in this diverse state."

In a Supplemental Report released by the WRDC on Sept. 27, 2012, the Commission stated that it "has concluded that there will be future water supply-demand imbalances in the state and that water supply and infrastructure projects will be needed" and that the members had reached consensus that formation of Regional Water Augmentation Authorities (RWAA) should be authorized by new state legislation for the purpose of assisting local communities in developing future water supplies and water supply infrastructure.

As both the Bureau of Reclamation Colorado River Study and WRDC Study illustrate, Arizona is now entering a new era of water challenges that will require consideration of a myriad of water supply enhancement, conservation, watershed management and water transfer proposals.

III. AUGMENTATION OF WATER SUPPLY

Both the Bureau of Reclamation Study and the WRDC Study contain various proposals to be considered for future augmentation of the water supply.

A. Bureau of Reclamation Proposals

The Bureau of Reclamation Study contains a list of future recommended actions to enhance the Colorado River water supply, including further studies related to water conservation, water use efficiency and reuse, water banking, water transfers, water marketing, water supply augmentation, watershed management, weather modification,

and tribal water rights; however, the Bureau study recognizes that there are significant uncertainties related to its recommended actions, including costs, permitting issues, energy availability issues relating to large-capacity augmentation projects, and other issues that have to be identified and investigated through feasibility-level studies. The study stated that Reclamation would convene the Basin States, along with a variety of other interested parties, in early 2013 to conduct a workshop to review the recommended next steps and initiate actions to implement the proposals to resolve current and future imbalances in the Colorado River system. In mid-2013 several working groups were established, consisting of various interests in the Basin, to develop options and strategies to help close the supply-demand gap.

B. WRDC Study

The Oct. 1, 2011 study by WRDC projects that total statewide water demand will range from a low of 8.1 million acre feet in 2035 to a high of 10.6 million acre feet in 2110. It identified potential future water supplies as including groundwater, surface water (both in-state rivers and the Colorado River), reclaimed water, and other water such as brackish or poor quality groundwater, mine drainage, agricultural drainage, desalinated water, and water made available through weather modification; however, similar to the Bureau of Reclamation study, the WRDC study concluded that there are numerous legal, technical, hydrologic, and economic issues relating to potential augmentation of the future water supply.

C. Central Arizona Project.

In a press release issued by the Central Arizona Project (CAP) on Dec. 12, 2013, the CAP pointed out significant steps that have already been taken in the State of Arizona within the CAP service area, which includes more than 80 percent of Arizona's total population and in excess of 200,000 acres of irrigated agriculture, to deal with the significant water supply shortfalls projected by the Bureau of Reclamation study to occur in the Colorado River Basin in the next 50 years.

It is stated in that press release that CAP uses 60 percent of Arizona's Colorado River water supply, and an assessment of what has been accomplished within the CAP service area shows that Arizona already leads the nation with rigorous water conservation and sustainability laws that protect Arizona water users and reduces reliance on the use of unsustainable groundwater supplies; that Arizona is a leader in adopting innovative conservation, reuse and water banking programs; that agricultural users have invested heavily in implementing efficient technology and delivery systems; that in the CAP service area agricultural conservation now exceeds an 80 percent efficiency target through lining canals, laser leveled fields, sprinkler systems, drip systems, and automated and real-time delivery systems. In addition, CAP is working to develop programs for use of agricultural runoff water and/or brackish groundwater through various types of treatment, including desalinization, and CAP is "looking at larger long-term projects that can contribute significant amounts of additional water to the Colorado."

As the CAP press release also noted, more than 95 percent of treated wastewater generated in central and southern Arizona is used for beneficial purposes, including

agricultural uses, groundwater recharge, power generation, industrial uses, turf irrigation, and other environmental purposes such as aquatic and riparian habitat. This includes approximately 20 billion gallons per year of sewage effluent from the City of Phoenix, which is transported by a 50-mile pipeline to the Palo Verde Nuclear Generating Station west of Phoenix for use in the station's cooling towers.

Although outside of the CAP service area and not mentioned in the CAP press release, it is also important to note that a significant amount of treated sewage effluent comes into the United States from Mexico at Nogales, Sonora, through a pipe that runs nine miles from the heart of Nogales, Sonora to the border and then another nine miles under the Nogales Wash to the Nogales International Treatment Plant in Rio Rico, Arizona. This International transfer of water carries between approximately 9.9 million and 13 million gallons of sewage effluent across the United States/Mexico border every day.

D. U.S. Forest Service Watershed Management

In addition to the work being done by the Bureau of Reclamation in the Colorado River Basin and by the WRDC and the CAP, the United States Forest Service also has significant involvement in watershed research and management activities that benefit Arizona's current and future water supply. Forested watersheds are the source of much of the surface water for the Colorado River and the Salt and Verde Rivers and the Gila River Basin in Arizona. In fact, the Tonto National Forest in Central Arizona was established in 1905 to protect the Salt River watershed and the Theodore Roosevelt Dam. Watershed management was initiated by the Forest Service in Arizona in the 1920s, is continuing at the present time, and is intended to continue into the future.

E. Arizona Department of Water Resources January 2014 Report

On Jan. 14, 2014, the Arizona Department of Water Resources (ADWR) released a comprehensive report entitled "Arizona's Next Century: A Strategic Vision for Water Supply Sustainability" (hereinafter Strategic Vision Report). This report assesses the current and projected demands and water supplies identified in the Bureau of Reclamation Study and the WRDC Study and provides potential strategies to help meet Arizona's future water needs.

The Strategic Vision Report has organized Arizona into 22 "Planning Areas" that are solution oriented to identify possible strategies to address projected future imbalances of water supply and demand. Like the WRDC study, the 2014 Strategic Vision Report recognizes that there may need to be in-state water transfers in order to meet regional imbalances.

IV. LEGAL CHALLENGES TO MEETING SUPPLY AND DEMAND IMBALANCES

The water of the Colorado River system is allocated by the Colorado River Compact of 1922 and the Boulder Canyon Project Act of 1928 and is subject to federal jurisdiction and control. As illustrated by the Bureau of Reclamation study, the legal challenges to meeting supply and demand imbalances will necessarily have to be dealt with at the federal level with input from the Basin States and other interested parties. Therefore, the primary focus of this

paper will be on legal challenges at the state level that must be overcome to meet in-state supply and demand imbalances.

As suggested by the Supplemental Report of the WRDC, the formation of Regional Water Augmentation Authorities may be necessary to assist local communities in developing future water supplies and water supply infrastructure. Meeting future water supply-demand imbalances in the geographically separated and divergent 22 "Planning Areas" organized by the Strategic Vision Report will most likely require some in-state transfers of water supplies. This presents particularly significant legal problems in Arizona since the nature, extent and relative priority of a water right must first be determined before a legal "right" to water can be transferred. The legal issues are further complicated by the fact, as pointed out in the WRDC study, that Arizona has a bifurcated water law system with groundwater and surface water being regulated by separate statutes, rules and judicial decisions.

Surface water in Arizona is subject to the doctrine of prior appropriation, whereby a person who first uses the water of a stream or other surface water source has the better right to beneficially use those waters as against all subsequent users. Under Arizona's common law, groundwater is not subject to the doctrine of prior appropriation and may be pumped by an overlying landowner, subject to the doctrine of reasonable use on the land from which the water is withdrawn. The "reasonable use" doctrine does not allocate water by either amount or priority and can lead to one landowner drying up the wells of a neighboring landowner. In addition, the common law reasonable use doctrine has been modified and, in some areas of the state, completely eliminated by legislative enactments. As will be discussed in detail later, some underground water is legally considered to be part of the surface flow of a stream and is subject to the doctrine of prior appropriation, thus further complicating the groundwater/surface water legal dichotomy.

Given this legal bifurcation of Arizona's groundwater/surface water supply, this paper will discuss the two categories of water under separate headings below with the focus being on a determination of what must be done to enable transfers of water to help meet supply and demand imbalances.

V. SURFACE WATER RIGHTS

In order to determine who has the prior appropriative rights to a surface water source, a fact-intensive judicial proceeding is necessary in order to determine the conflicting claims to the water source. This is sometimes done by one individual or group of individuals suing another individual or group of individuals in order to determine the amount and priority rights among those parties. This has been done in a number of instances over the years throughout Arizona and court decrees have been rendered determining relative priority rights among the parties, such as the Kent Decree determining rights in the Salt River Valley to water diverted from the Salt and Verde Rivers; however, in order to determine conflicting water rights on a complete stream-wide watershed basis, a much broader proceeding is necessary. This proceeding is what is known as a "General Stream Adjudication."

A. Arizona's General Stream Adjudication Proceedings

Arizona has statutory proceedings authorizing general adjudications of water rights. General adjudication proceedings may be instituted by one or more water users upon a river system and source or by the state of Arizona at the request of any state agency, other than the Arizona Department of Water Resources. A general adjudication is defined by statute as "an action for the judicial determination or establishment of the extent and priority of the rights of all persons to use water in any river system and source."

There are now two general stream adjudications pending in Arizona involving the Gila River System and Source (Gila Adjudication) and the Little Colorado River System and Source (Little Colorado Adjudication). Less than 18 percent of the land in Arizona is under private ownership with almost 13 percent of the remainder comprising State Trust Land and the remaining 69 percent in either federal or Indian ownership. These two adjudications include more than half of Arizona where most of the Indian reservations and federal land are located.

The initial stage of the Gila Adjudication began on April 26, 1974, based on a petition filed with the Arizona State Land Department to determine the water rights in the Salt River above Granite Reef Dam. Utilizing these same statutes, the proceedings were subsequently expanded to determine all water rights of the Gila River system and source, and similar proceedings were initiated to adjudicate the Little Colorado River system and source.

In 1979, the Arizona Legislature amended the general adjudication procedures, and the adjudication proceedings were transferred from the State Land Department to the Superior Court. The Gila Adjudication is assigned to the Maricopa County Superior Court and the Little Colorado Adjudication is assigned to the Apache County Superior Court; however, both proceedings are now assigned to the same judge, who sits as a Superior Court judge in Maricopa County. A Special Master has been appointed to assist the judge and report on legal and factual issues designated by the judge under a specific order of reference.

There are approximately 30,000 parties in the Gila Adjudication and 5,000 parties in the Little Colorado Adjudication and, according to the ADWR Strategic Vision Report, as of July 2013, there are 83,244 surface water claims in the Gila Adjudication and 14,522 claims in the Little Colorado Adjudication. Although the adjudications have been pending since 1974, no individual state law based surface water claims have yet been adjudicated. There have been, however, substantial water rights settlements with various Arizona Indian tribes, a matter which will be discussed in detail later.

There are several reasons for the lack of progress in the adjudication of claims including the sheer number of parties and claims to water involved. In addition, there have been jurisdictional disputes and the necessity to resolve various legal issues early on in the proceedings that have caused significant delay.

1. Jurisdictional Disputes

Pursuant to a federal statute know as the "McCarran Amendment," the United States may be joined in a state court proceeding for the adjudication of rights to use the water of a river system or other source, including claims by the United States on behalf of Indian tribes. The United States was joined in both the Gila Adjudication and the Little Colorado Adjudication proceedings under the authority granted by the McCarran Amendment. However, several of the Indian tribes and the United States, on their behalf, challenged the jurisdiction of the Arizona Courts to adjudicate water rights of Indian tribes in two actions filed in Federal District Court in ArThe case eventually ended up before the United States Supreme Court, and in 1983 the United States Supreme Court ruled in favor of the State of Arizona, finding that the McCarran Amendment did allow for the adjudication of federal water right claims in state court proceedings, including Indian tribal water rights, as long as the case involves a comprehensive adjudication of the rights to use water from the water source in question.

The United States Supreme Court remanded the actions challenging jurisdiction to the Ninth Circuit Court of Appeals, which then directed the Arizona Federal District Court, where the jurisdictional challenges originally arose, to stay the district court actions pending the conclusion of the Arizona general stream adjudications. But again the United States and Indian tribes moved to dismiss the state court Gila Adjudication based on state law jurisdictional grounds in the Maricopa County Superior Court proceedings. The motion was denied and eventually went to the Arizona Supreme Court for resolution. In 1985, the Arizona Supreme Court ruled against the United States and tribal challenges, finding that Arizona state courts do have state law jurisdiction to adjudicate Indian water claims in a general stream adjudication proceeding, and the matter was again remanded to the Arizona Superior Court to proceed with the comprehensive adjudication of all water right claims to surface water in the Gila River and Little Colorado River Adjudication proceedings.

2. Interlocutory Appellate Review Proceedings

By the time jurisdiction to proceed with the adjudication of federal and tribal water rights was confirmed by the Arizona Supreme Court, almost 11 years had elapsed since the 1974 filing of the initial petition to adjudicate rights on the Salt River. Following confirmation of Arizona's jurisdiction to adjudicate federal and tribal water right claims, in 1986 the Maricopa County Superior Court judge who was then presiding over the Gila River Adjudication established procedures for management of the litigation and identified legal issues the court needed to resolve before finally adjudicating individual claims.

In 1989, the Arizona Supreme Court issued a Special Procedural Order Providing for Interlocutory Appeals designed to provide a mechanism for appellate review of important legal decisions of the trial court at the outset of the litigation. Pursuant to this special procedural order, in December 1990 the Arizona Supreme Court accepted six legal issues for review and spent the next 11 years hearing and ruling on those six issues.

The Court ruled on Issue One, involving the procedures that the Arizona Department of Water Resources had used for publishing and mailing notice of the adjudication to potential claimants, and the Supreme Court found that these procedures were constitutionally sufficient. The Supreme Court also decided that issue six, relating to the superior court's procedure for addressing conflicting rights, did not need to be addressed during the interlocutory appeal process; however, important legal issues –designated as Issues Two, Three, Four and Five – were decided by the Supreme Court after extensive briefing and oral argument and are critical legal rulings basic to the comprehensive stream adjudication process.

a. Issues Four and Five

Issues Four and Five related to whether the holder of a federal reserved water right, such as the United States or an Indian tribe, has a right extending to "percolating" groundwater despite Arizona's bifurcated system of water law which precludes a state law water user from "appropriating" percolating groundwater. The federal reserved rights doctrine holds that the federal government impliedly reserved the amount of water necessary to accomplish the purposes of a federal reservation at the time that the reservation was established. Federal reserved rights are not subject to many of the requirements of the prior appropriation doctrine, and their "priority date" is the date the reservation was created, not the date that water was first used.

Specifically, in regard to Issue Four, the Arizona Supreme Court was required to determine if federal reserved rights extend to groundwater that is not subject to prior appropriation under Arizona law. Issue Five required the Court to determine whether federal reserved right holders are entitled to greater protection from groundwater pumping than are surface water users holding state law prior appropriation rights. In addressing Issue Four, the Court noted that most prior appropriation states have abandoned Arizona's bifurcated groundwater/surface water approach; however, the Court refused to follow those other states, reaffirming its prior decisions that it was too late to modify Arizona groundwater law because the State Legislature and water rights holders had relied for so long on the existing system. The Court did find, however, that unlike the holders of state law prior appropriation rights, federal reserved rights holders were not limited by Arizona's bifurcated treatment of groundwater/surface water and federal reserved rights apply to groundwater, regardless of whether it is part of the flow of a surface stream or non-appropriable "percolating" groundwater. Regarding Issue Five, the Supreme Court held that once a federal reserved right to groundwater is established, the federal reservation may invoke federal law to protect its groundwater to the extent that such protection is necessary to fulfill the reserved right.

b. Issue Two

Issue Two involved the question of what underground water constitutes appropriable "subflow" of a surface stream and is subject to adjudication as surface water and what underground water constitutes "percolating" groundwater that is not subject to adjudication as surface water. This is an important legal issue in Arizona because thousands of individuals and entities have, over the years, installed wells in the vicinity of Arizona surface streams, arguably assuming that they were withdrawing "percolating" groundwater that was not subject to the prior claims of holders of senior prior appropriative stream water rights. Issue Two was before the Arizona Supreme Court on two separate occasions, first in 1993 and, after a remand to the trial court, again in 2000. The 2000 decision confirmed a trial court finding that a geologic unit next to a stream bed known as the "saturated floodplain Holocene alluvium" best defines the subflow zone of a stream under Arizona law and that wells located within the subflow zone are presumed to be pumping subflow and wells located outside that geologic unit are presumed not to be pumping subflow; however, a well located outside the subflow zone will be found to be pumping appropriable subflow water if the cone of depression created by the well pumping reaches the subflow zone and the pumping affects the volume of surface and subflow in an amount capable of being measured. Thus, further complicating matters, a well can be found to be pumping water that is a combination of both appropriable "subflow" and non-appropriable "percolating" groundwater.

c. Issue Three

The final decision on the six issues originally referred to the Arizona Supreme Court for Interlocutory Appeal was decided in 2001 and required the court to define the standard for quantifying the amount of water for Indian reservation federal reserved rights. The Arizona Supreme Court found that the essential purpose of Indian reservations is to provide Native American people with a "permanent home and abiding place" that is a "livable environment" and that the best approach for satisfying the purposes of Indian reservations as a permanent homeland is one that balances a myriad of factors, including agricultural production, commercial development, industrial use, residential use, recreational use, and wilderness uses, but that the Indian reserved rights are limited by the concept of "minimal need" such that the federal reserved right reserves only that amount of water necessary to fulfill the purpose of the reservation and no more. This "minimal need," however, has to take into account both the present and future needs of reservations.

3. Progress of the Adjudications Following the Arizona Supreme Court's Interlocutory Review Decisions.

Following the Supreme Court's Interlocutory Review Decisions, the pace of the adjudications, insofar as they relate to state law prior appropriation rights,

has continued to be dismal. The decisions did, however, provide the basis for significant progress in the resolution of Indian tribal water right claims.

B. Resolution of Tribal Water Right Claims

Given the Arizona Supreme Court decision determining the standard for quantifying the amount of water for Indian tribal federal reserved rights and the decision that the holder of a federal reserved right, such as the United States or an Indian tribe, has a right extending to "percolating" groundwater, despite Arizona's bifurcated water law system, the focus of the adjudication proceedings turned to the determination of Indian tribal federal reserved water rights. This then lead to the possibility of a settlement of tribal water right claims. In this regard, on May 16, 1991, the Arizona Supreme Court enacted a Special Procedural Order Providing for the Approval of Federal Water Rights Settlements, Including Those of Indian Tribes. The order sets forth the conditions upon which such settlements may be made in special proceedings in the general adjudications. These conditions include the requirement that Indian water rights or rights for other Federal reservations have been determined in a settlement agreement among the Indian tribe, in the case of Indian water rights, the United States, and a group of claimants in the general adjudication proceedings whose claims are adverse to the claim of the United States or the Indian tribe and that the settlement agreement that determines the Indian water rights or water rights for other Federal reservations has been confirmed by an Act of Congress or the appropriate Federal agency. The final condition is that the terms of the settlement agreement, or the Act of Congress, or the appropriate Federal agency that confirms it, requires that the settlement agreement be approved by the general adjudication court or are conditioned upon such approval.

Pursuant to Federal legislation and the Arizona Supreme Court's Special Procedural Order, Indian tribal water rights settlements and judicial confirmation have occurred in the adjudication proceedings as follows:

1. Southern Arizona Water Rights Settlement Act of 1982 settled claims for the San Xavier District and the eastern portion of the Schuk Toak District and the Tohono O'Odham Tribe.

2. Ak-Chin Indian Community Water Rights Settlement Act of 1984.

3. Salt River Pima-Maricopa Indian Community Water Rights Settlement Act of 1988.

4. Fort McDowell Indian Community Water Rights Settlement Act of 1990.

5. San Carlos Apache Tribe Water Rights Settlement Act of 1992 which settled claims to the Salt and Verde Rivers.

6. Yavapai-Prescott Indian Tribe Water Rights Settlement Act of 1994.

7. Zuni Indian Tribe Water Rights Settlement Act of 2003.

8. The Arizona Water Settlement Act of 2004 which makes allocation of Central Arizona Project water between Indian and Non-Indian uses for the Gila River Indian Community and the Tohono O'Odham Nation and includes the Gila River Indian Community Rights Settlement Act of 2004 and the Southern Arizona Water Rights Settlement Amendments of 2004.

The White Mountain Apache Tribe, the United States, and neighboring state law appropriators reached a settlement agreement with each other in January 2009, and federal legislation authorizing the settlement was signed by the President and became effective on December 10, 2010. The next step is for the parties to seek court approval of the agreement, which will include rights in both the Gila and Little Colorado River adjudications.

Attempts to settle the claims of the Navajo Nation and the Hopi Tribe in the Little Colorado Adjudication have been unsuccessful, and the Hopi Tribe claims are now the focus of judicial activity in the Little Colorado Adjudication.

C. Establishment of Subflow Zones

April 26, 2014 marked 40 years since the first petition was filed to begin the adjudication process on the Gila River System and Source, yet no non-federal, non-Indian water rights have been determined during that 40-year period. In addition to the complexities discussed above relating to the enormous number of claims to water involved and the time involved to get jurisdictional disputes resolved and the preliminary interlocutory rulings through the court process, the major problems now holding up the adjudication proceedings relate to Arizona's bifurcated water law system and a lack of funding for the Arizona Department of Water Resources (ADWR) to carry out its statutory duties relating to the adjudication proceedings, including establishing subflow zones.

When the Arizona Supreme Court decided the appropriate legal standard for determining the subflow zone in its decision in 2000, the Supreme Court made the often-quoted statement that "the record reflects that the saturated floodplain Holocene alluvium is readily identifiable; that DWR [The Arizona Department of Water Resources] can quickly, accurately, and relatively inexpensively determine the edge of that zone;" and that "the entire saturated floodplain Holocene alluvium, as found by DWR, will define the subflow zone in any given area." The Arizona Supreme Court's 2000 decision arose out of attempts to establish the subflow zone for the San Pedro River Basin, which is part of the Gila River General Stream Adjudication proceedings. Given the Supreme Court's quoted belief, one would assume that the subflow zone would have been quickly established in the San Pedro River Basin and that the adjudication of the San Pedro River would now be completed or well under way; however, that did not happen.

On Sept. 22, 2014, it will be 14 years since the Arizona Supreme Court made its often-quoted statement that "DWR can quickly, accurately, and relatively inexpensively determine the edge of that [subflow] zone." ADWR's first attempt to delineate the subflow zone for the San Pedro River watershed was completed and released in June of 2009; however, it met with significant opposition from both surface water users and

groundwater users and, after a comprehensive evidentiary hearing, was rejected by the trial court. The next iteration of ADWR's determination of the San Pedro River watershed subflow zone was filed by ADWR on April 1, 2014. Again, it is expected that some of the parties to the adjudication may have objections to the new subflow zone delineation but, if the new subflow zone delineation is acceptable to the court, then proceedings can continue on the San Pedro River watershed in an attempt to adjudicate state law prior appropriative water rights and federal claims to that watershed. In the meantime, work has begun on delineation of the subflow zone for the Verde River watershed, but it is anticipated that no subflow zone report for the Verde River watershed will be released by ADWR until after the parameters of an acceptable subflow zone have first been established for the San Pedro River watershed.

D. Responsibilities of the Arizona Department of Water Resources

The ADWR has significant involvement in and responsibilities for the conduct of the general stream adjudication proceedings. The ADWR is the Court's technical advisor and, in addition to its responsibility for determining subflow zones for each stream, it is required by statute to prepare and publish comprehensive Hydrographic Survey Reports (HSRs) for each of the ten watersheds within the two general stream adjudications. HSRs are necessary multi-volume publications that involve data collection and field inspection efforts, including detailed information regarding land ownership, hydrology, the factual basis for each water right claim (in excess of 83,244 in the Gila adjudication and 14,522 in the Little Colorado adjudication) and ADWR's recommendations regarding the water rights attributes for each individual water right claim or use investigated. ADWR is required to prepare both a preliminary and final draft HSR for each of the watersheds. When the preliminary draft is published, ADWR must provide notice of the filing of the preliminary HSR to each party and water user within the watershed at issue and must review any comments received and then prepare a final HSR.

ADWR is also required to prepare and publish technical reports on specific issues such as subflow zone delineations or other factual matters within the adjudications, such as Indian water rights settlements, *deminimus* uses of water, and other procedural issues or status reports requested by the trial court judge. Thus, ADWR has a significant and substantial role in the conduct of the adjudications, but due to lack of sufficient funding for the Department, ADWR does not have an adequate staff or resources to devote to a speedy and efficient attempt to timely complete the adjudication process for the ten watersheds at issue in the Gila River Adjudication and the Little Colorado River Adjudication.

E. Steps to take to speed up the General Stream Adjudication Proceedings

In 1985 when the Arizona Supreme Court held that the State of Arizona has jurisdiction to adjudicate federal and Indian claims to water in the general stream adjudication proceeding, the Court noted that the current state of Arizona's water supply is critical. The Court stated that, at that time, water usage in Arizona exceeded available surface supply by three-fold in average years and by more in dry years and that the shortfall was made up by pumping groundwater, which was causing a depletion of the available groundwater supply. The Court also stated that since the amount of surface

water available is insufficient to satisfy all needs, and since Arizona follows the doctrine of prior appropriation, it was unavoidable that the priority of claims of large water users would reduce, if not eliminate, the amount of water available to water users with a lower priority. The Arizona Supreme Court stated: "The problem, therefore, is clear. 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."

Now, 29 years later, the need to determine priorities and quantify water rights still exists and, as illustrated by the ADWR 2014 Strategic Vision Report, is becoming even more critical. That report identifies various statewide strategic priorities, which include the resolution of Indian and non-Indian water rights claims in the Gila and Little Colorado general stream adjudication proceedings. ADWR noted: "Until that process is complete, uncertainty regarding the nature, extent and priority of water rights will make it difficult to identify all the strategies necessary for meeting projected water demands." ADWR "believes that options need to be developed by the State to accelerate this process." The Strategic Vision Report then recommends the creation of a study committee to develop options in a short time frame to help provide guidance to ADWR so that adequate funding can be identified and obtained to complete the necessary technical work to support completion of the adjudication process, with the focus being on "conceptualization of water rights administration in a post-adjudication Arizona."

Another statewide strategic priority identified by ADWR is the role of in-state water transfers; however, a precursor to in-state transfers of surface water rights requires a completion of the adjudication proceedings in order to have a determination of priority and quantification of what water rights exist that can be transferred.

The ADWR Strategic Vision Report sets forth a 10-Year Action Plan Outline which includes "Establish Adjudication Study Committee (Year 1)," "Review and implementation of Adjudication Study Committee Findings (Year 3)," "Resolve Remaining Indian Settlements (Year 1-10)," and "Resolve General Stream Adjudication (Year 5-10)." The ADWR 10-Year Action Plan sets forth a laudable effort to attempt to speed up and complete the two general stream adjudications now pending in Arizona, although given past history the time frame set forth in the action plan for completing the adjudication proceedings may be overly optimistic.

Whatever steps are taken to speed up and complete the adjudication proceedings and develop options to accelerate this process will require a combination of legislative and judicial action. It is obvious that any substantial funding to support the ADWR current statutorily mandated activities arising out of the adjudication proceedings will have to be done by the Arizona Legislature. However, legislative action directed at simplifying and speeding up the adjudication process, other than necessary funding, must walk a fine line, as illustrated by a previous attempt of the Arizona Legislature to do just that.

In the early 1990s the slow pace and complexity of the litigation and the extreme cost to the parties prompted a group of parties to both adjudication proceedings to approach the Arizona Legislature to enact legislation to modify and simplify the proceedings. In response, in 1995 the legislature enacted House Bills 2276 and 2193,

which revised numerous statutes dealing with surface water rights and the general adjudication process. Shortly thereafter various Indian tribes, joined by the United States, filed an action with the Arizona Supreme Court challenging the constitutionality of the enactments, and the Supreme Court accepted the matter in order to determine the constitutional issues.

This judicial proceeding terminated in January 1999, when the Arizona Supreme Court invalidated, on state constitutional grounds, the bulk of the changes made by the new legislation. The Supreme Court held that the water rights of the parties in the Gila and Little Colorado general stream adjudications are vested substantive property rights, that the legal effect of the acts that resulted in acquisition and priority of water rights cannot be changed by subsequent legislation, and that any attempt to do so violated substantive due process rights under the Arizona Constitution. The Court also held that any attempt by the Arizona Legislature to adjudicate pending cases by defining existing law and applying it to facts is prohibited by the Arizona Constitutional Separation of Powers. The Court acknowledged that the Legislature could make procedural changes that can be applied retroactively, but that substantive changes cannot be applied retroactively to change the legal effect of past acts. The power to define existing law, including common law, and apply it to facts lies exclusively within the judicial branch.

This 1999 decision by the Arizona Supreme Court leaves little, if any, leeway for the Legislature to mandate any substantive changes in the law that result in determining the extent and priority of water rights in the general adjudication proceedings. The Legislature is not, however, prevented from making changes in the law, which would modify the role of the ADWR in carrying out its duties and responsibilities in the general stream adjudications, since those duties and responsibilities are of statutory origin. The 1995 legislation created a joint legislative adjudication monitoring committee to report at least annually on findings and recommendations for legislative action considered necessary to "the efficient, prompt and just conclusion of the adjudications." Perhaps approaching this committee will be one of the "options" pursued under ADWR's Strategic Vision Report.

Identifying the strategic "options" that need to be developed by the state to accelerate the general stream adjudication process will necessarily require judicial input and action. In this regard, neither the parties to the general stream adjudication proceedings nor the court have been remiss in considering a variety of steps that could be taken in order to speed up the adjudication process.

First, as discussed above, the Arizona Supreme Court has enacted a Special Procedural Order Providing for the Approval of Federal Water Rights Settlements, Including Those of Indian Tribes. This special procedural order provides for a judgment entered pursuant to the provisions of the order to be binding upon all parties to the adjudication and has worked well. It has been used for judicial confirmation of seven major Indian water right settlements. When a somewhat similar special procedural order was proposed by various parties to the two adjudication proceedings for enactment by the trial court for review and approval of water right settlements not involving Indian and non-Indian federal water right claims, the proposal met with substantial opposition from some of the state parties as well as the federal parties. The primary focus of the

opposition was on the binding effect of a court-approved settlement on non-signatory parties. Given the opposition to the proposed special procedural order, it was withdrawn from consideration by the court; however, there are claims of groups of water right users, particularly in the upper Verde watershed, which could most likely be settled and approved by the Court if a procedural order were in place authorizing such settlement. This would definitely help to speed up the process of completing the adjudication proceedings. Therefore, one of the "options" that should be considered by the judiciary to speed the adjudication process is the option of providing a mechanism for settling non-federal, non-Indian claims to water rights.

Second, both adjudication proceedings have adjudication steering or settlement committees to which matters are referred by the trial court. In a Sept. 28, 2012 report of a working group of the committees, several recommendations were made to the trial court regarding steps to be taken to help speed up the adjudication process. One of those recommendations is related to the funding of the Special Master's expenses because the current source of funding, i.e., adjudication filing fees, were projected to be insufficient to meet expenses after about Dec. 31, 2013 for the Gila Adjudication and about June 30, 2015 for the Little Colorado Adjudication. Once those filing fees are exhausted, the adjudication statutes already provide for the Special Master's compensation and other expenses related to the conduct of the adjudication to be paid from the State general fund as a separate line item for appropriation. The process is now underway to obtain the necessary funding for the Special Master and needs to be completed in order to assure that the Special Master can continue functioning in both the Gila Adjudication and the Little Colorado Adjudication.

Another recommendation made by the working committee is that the superior court judge who is assigned to the adjudication proceedings devote not less that one half of his or her time to the adjudications. Adjudication of major claims generally has proceeded in two phases: A presentation of evidence and briefing phase before the Special Master followed by briefing before the superior court. As noted by the working group, this practice effectively has doubled the expense to the parties and more than doubled the time required to resolve the issues. The committee recommended that the superior court judge retain claims for the judge's own attention regarding the larger claims and assume direct control of those claims and only refer discrete matters to the Special Master for consideration. This would speed up the process and eliminate much of the expense to the parties. Proceedings are now under way to transfer various pending federal claims in the San Pedro watershed proceedings to the trial judge for resolution. A group of claimants, led by the United States, opposed the transfer and attempted to stay all further proceedings to determine federal claims on the San Pedro watershed until the subflow zone has been determined and the HSR for the San Pedro watershed has been completed. The trial court, however, rejected the request to stay the proceedings.

The working group also recommended greater funding for the ADWR Adjudication Division to allow it to undertake in a timely manner those tasks assigned to ADWR by statute, the Court, or Special Master. The duties and responsibilities of the ADWR in the conduct of the adjudications are enormously expensive and time consuming when one considers that there are ten watersheds for which subflow zones

must be determined and for which massive and complex Hydrographic Survey Reports are required to be prepared by ADWR. Lack of adequate funding for ADWR is one of the prime reasons progress has been so slow that not even one acceptable subflow zone report for even one of the ten watersheds involved has been accepted by the Court.

The working group also recommended that statutory changes be made regarding the tasks of the ADWR and that progress in the adjudications might be better served by giving the Superior Court and Special Master greater discretion in determining the geographic scope, subject matter and timing of the ADWR reports and even dispensing with a report where it would not contribute to resolving a claim. Thus, amending the legislation to give the Court and Special Master more discretion in what activities the ADWR should undertake, rather than mandating those activities as the legislation presently does, would also help speed up the process of the adjudications and lower the costs of ADWR activities, which would be politically wise and acceptable.

The working group recommended authorizing the Special Master to participate in mediation directed to resolving small claims. It also recommended that contested cases, i.e., groups of related claims on a particular portion of a watershed or involving particular types of uses, should be managed differently, depending on whether they involve large water users and claims or small water users and claims. This would include more extensive technical assistance being provided by ADWR for parties that cannot afford technical consultants or expert witnesses and who may not even be able to afford attorneys. Larger claims could be handled more consistently as typical civil litigation where the claimant is obliged to prove the validity of its claim and where the parties follow court rules regarding discovery, dispositive motions, and trial. The working group recommended that those larger cases should be addressed by the superior court judge rather than the Special Master, but that discrete factual issues could be assigned to the Special Master for evidentiary hearings where appropriate. Also, the working group recommended that clear, predictable deadlines be issued from which the superior court judge or Special Master would depart only upon a showing of compelling need.

The working group further recommended that the superior court should consider the creation of a technical committee to prepare consensus-based technical reports and models to be used in the adjudication for such things as determining what wells are or are not pumping water from a subflow zone, whether a well is only pumping percolating groundwater which is not subject to the adjudication proceedings, or whether a well is pumping water that is subject to a federal reserved claim even if it is pumping only percolating groundwater.

Outside of the funding issues and substantive changes to ADWR's statutory duties, most if not all of these working committee recommendations to speed up the process can be handled by the judiciary and do not need to await ADWR's recommended strategic priorities study. In fact, adoption of the working group recommendations by the superior court would help to simplify the ADWR strategic priorities "options" study.

When the Ninth Circuit Court of Appeals remanded the adjudication proceedings back to the Arizona Federal District Court, the Ninth Circuit Court made it clear that the federal court proceedings were to be stayed until the state court proceedings have been

concluded barring a "significant change of circumstances." In other words, if the state court proceedings do not continue toward a resolution of the adjudication proceedings in a reasonably timely and efficient manner, the proceedings could, at least in theory, end up back in the federal court system. The state court, many of the parties to the adjudication proceedings, and the ADWR recognize this possibility and generally agree that steps need to be taken to speed up the adjudication proceedings given the necessity to determine the priority of and extent of prior appropriative rights to surface water in the state of Arizona; however, not all parties to the adjudication proceedings are eager to see the adjudications completed. In the final analysis, the adjudication proceedings are adversary proceedings, and not all parties will benefit from having their rights to surface water adjudicated. Given the number of parties and claims to water and the limited water supply, some parties will undoubtedly find that there is not enough water to satisfy all of the claims or that their priority right is so remote that it cannot be satisfied during periods of reduced surface water availability. In addition, there will be claims to water that cannot be satisfied because the claimant has no legal right to the water being used or claimed by the party. This is particularly true when the party claims the right to pump underground water that is determined to be appropriable subflow water to which the pumper has no claim to a prior appropriative right. Under these circumstances, the claimant stands to lose all or part of the water, which they may have been using for many years. Thus, delaying the adjudication of those claims will better serve the economic interest of such party claimants. Nevertheless, getting the general stream adjudication proceedings completed will ensure state court rather than federal court jurisdiction and will provide certainty of water rights to enable the state to address the projected future supply and demand imbalances of water in Arizona.

F. Transfer of Surface Water Rights

Prior appropriative surface water rights, such as those at issue in the Gila and Little Colorado adjudications, are vested substantive property rights and can be bought and sold distinct from land. Statutory provisions provide a procedure for changes in the purpose of use of water and changes in point of diversion of the water from a stream or other surface water source. Also by statute, a prior appropriative right to surface water may be severed and transferred from one place of use to another place of use with approval and consent of the appropriator of the right, subject to a number of conditions to be met before the requested transfer will be approved. The applicant must establish that the requested transfer will not affect vested right, and must establish the validity of the appropriative rights to be transferred, including proof that the rights have not been abandoned or forfeited. No severance or transfer of water rights is permitted or allowed from lands within the exterior boundaries of any irrigation district, agricultural improvement district, or water users' association without first having obtained the written consent and approval of the irrigation district, agricultural improvement district, or water users' association governing body. In addition, no right to the use of water on or from any watershed or drainage area which supplies or contributes water for the irrigation of lands within an irrigation district, agricultural improvement district, or water users' association may be severed or transferred without the consent of the governing body of the irrigation district, agricultural improvement district, or water users' association. A severance and transfer of an irrigation water right appurtenant to lands within the boundaries of an

irrigation district to other lands in the same district for agricultural use may be accomplished by the exclusion of land to which the water right is appurtenant and the inclusion in lieu of other lands within the boundaries of the district. This type of severance and transfer requires only the consent of the irrigation district and the owners of the lands affected by the severance and transfer and the approval of the Director of the ADWR is not required. Subject to this exception, no other severance or transfer of water rights may be made unless approved by the Director of the ADWR. The Director is required to define and limit the amount of water to be diverted or used annually, subsequent to the transfer, and the Director must prescribe the conditions of the approval. If objections are filed to the application for severance and transfer of the water right, an administrative hearing may be held if the Director determines a hearing to be necessary to hear and consider the objections and determine what conditions should be attached to a proposed transfer or whether the transfer should even be allowed.

Although the legal framework exists for transfer of surface water rights, as pointed out in the ADWR 2014 Strategic Vision Report, in-state water transfers are a source of significant controversy. In order to make such transfers acceptable, serious consideration has to be given to third party impacts of such transfers. The economic impact on existing water users and economies built on the water supply must be considered and protected in order to make such transfers politically acceptable. Arizona has significant experience in considering and dealing with such impacts arising out of the Indian tribal water right settlements that have taken place in the Gila and Little Colorado adjudication proceedings. Those settlements were structured to protect existing rights and minimize the impact on existing economies. Such steps will also need to be taken to minimize the controversy over any in-state transfers that may be considered in meeting future water supply and demand imbalances.

VI. GROUNDWATER RIGHTS

Under Arizona's common law, percolating groundwater is not appropriable and may be pumped by the overlying landowner, subject to the doctrine of reasonable use on the land from which it is withdrawn; however, land ownership does not include ownership of the groundwater itself. Under the common law, land ownership simply affords a qualified right to extract and use the groundwater for the benefit of the land. Thus, unlike a surface water right, which permits the severance and transfer of water rights from the associated real property, the common law groundwater user does not have a real property interest in the potential future use of groundwater which may be severed and transferred from the overlying land. Ownership of groundwater under the common law only occurs after the percolating waters are reduced to actual possession and control by the person claiming the water.

Since the right to use percolating groundwater underlying an owner's land is not a vested substantive property right, as are prior appropriative surface water rights, the legislature is free to choose between competing uses of groundwater and to modify such rights in the public interest as an exercise of the legislature's police power. The Legislature has exercised this right in a number of instances. For example, the 1980 Groundwater Management Act modified the common law reasonable use doctrine and essentially replaced it with specific statutory limitations on existing and future groundwater rights. The Groundwater Management Act is

considered to be one of the most comprehensive groundwater management regimes in the United States and established a timeline for the reduction and elimination of groundwater pumping in certain areas of the state. The Act designated various Active Management Areas and Irrigation Non-Expansion Areas, and it highly regulates the use of groundwater in those areas, including various permitting requirements regulating groundwater withdrawals and transportation of groundwater within Active Management Areas.

Under the common law reasonable use doctrine, landowners had the right to capture and use the percolating underground water for a beneficial purpose on the land from which it was withdrawn, but they could not transport groundwater off the land from which it came if the transfer injured the groundwater supply of neighboring property owners. The groundwater code has changed this basic doctrine in many respects and now allows some transportation of groundwater for use off the land from which it is withdrawn. For example, in Active Management Areas the groundwater code allows the withdrawal and transportation of groundwater within the same groundwater sub-basin without payment of damages caused to another groundwater user in that same sub-basin. Withdrawal and transportation of groundwater between sub-basins in an Active Management Area or out of an Active Management Area is highly regulated by statutory enactment.

Outside of the Active Management Areas, withdrawal and transportation of groundwater within the same groundwater sub-basin or the same groundwater basin, if there are no sub-basins, is allowed without payment of damages. Withdrawal and transportation of groundwater between sub-basins is allowed, subject to payment of damages. Except in limited circumstances specified by statute, groundwater may not be transported away from a groundwater basin.

The state legislature passed the Groundwater Transportation Act in 1991, prohibiting most transfers of groundwater between hydrologically distinct groundwater sources. The law was passed in response to some of the larger cities in Maricopa and Pima Counties purchasing large farms in other areas of the state to purchase and transfer land to obtain the groundwater supply to augment their city water supplies. The purpose of the Transportation Act was to protect hydrologically distinct groundwater supplies and the economies in rural areas by insuring that the groundwater is not depleted in one groundwater basin to benefit another. The law does, however, still allow for limited exceptions to these restrictions, under specific statutory conditions that are unique to each exception and involve seven different areas in the state.

Unlike the constitutionally protected vested substantive property rights attached to prior appropriative surface water rights, which protect those rights from legislative interference and abrogation, the legislature is free to choose between competing uses of groundwater and to modify rights to use groundwater in the public interest as an exercise of the legislature's police power. Therefore, any changes in law that may be necessary to allow for more freedom in the withdrawal and transfer of groundwater are mainly subject to political, rather than legal, restrictions such as those discussed above relating to in-state surface water transfers. As the ADWR's Strategic Vision Report discusses, moving water from one area of Arizona to another "has the potential to create controversies, especially if the area from which the water is being transferred has existing water uses and economies built on that water supply." Thus, although the legislature may not be legally inhibited from amending or enacting laws giving more freedom to transfer groundwater supplies, it may be politically inhibited from doing so.

CONCLUSION

This new era of Arizona water challenges will require an innovative approach to securing new sources of water to augment our current and future water supply. We must also be concerned with possible increased costs to deliver CAP water because of potential future limitations of the Navajo Generating Station to supply relatively inexpensive power for CAP water deliveries. Increased costs for CAP water could significantly affect the value of CAP water contracts and also increase the cost of marketing Indian tribal water rights supplied by settlements based on reallocation of CAP water. No matter what innovative methods may eventually be used to attempt to solve our predicted future water shortages, it is imperative that the water right adjudications pending in the Gila River and Little Colorado River watersheds be completed in the reasonably near future in order to determine the nature, extent and priority of water rights that is necessary to develop strategies to identify and provide solutions to address the supply and demand imbalances.

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