Property Rights in Groundwater— Some Lessons from the Kansas Experience

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Editor's Note:
Professor Peck presented a paper at the 3rd World Water Forum in Kyoto, Japan, on March 19, 2003, in a session on property rights in groundwater. This article is based in part on that paper. Another speaker at the session was Dr. Katar Singh of India, whose paper *Co-operative Property Rights as an Instrument of Managing Groundwater*[1] focused on the problems of his country and other locations in the world experiencing groundwater mining, but where there are no property systems in place to deal with that problem. Dr. Singh discussed reasons why groundwater is over-exploited under existing institutional arrangements, using in part "the N-person Commons Dilemma game,[2] and he then proposed the "creation and enforcement of co-operative property rights in groundwater" to make the resource manageable and to reduce its over-exploitation.

I. INTRODUCTION

In general, individual American states, not the Federal Government, control the water resources within state borders.[3] With respect to state law of river water, the nation can be divided into two large sections, East and West. Precipitation is heavier in the East than the West. Eastern states generally apply the "riparian doctrine,"[4] while western states apply the "prior appropriation doctrine." The prior appropriation doctrine grew out of the practices and adopted customs of California

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Gold Rush miners who recognized rights held by earlier users against later users.[5] "First in time is first in right" is the cardinal rule. Water need not be used on riparian land, and water rights are lost for failing to use the water. In times of water shortage, which occurs seasonably in most Western States, holders of "senior rights"[6] can enjoin holders of "junior rights," such that the full amount of the senior holder's rights are protected—not shared, as is done in the riparian system.

With groundwater, several doctrines have grown in the U.S., and in a less regular geographic fashion. States embrace one of several doctrines including the prior appropriation doctrine.[7] Employment of the prior appropriation doctrine for groundwater, however, has some inherent problems compared to its use for surface water. With the seasonable fluctuations of rivers and streams, this doctrine works well; holders of junior rights who are shut down late in a season in favor of holders of senior rights can generally count of having water again the next spring. With groundwater in areas where recharge is slow, however, these seasonal variations do not exist. In areas of groundwater "mining,"[8] in a sense, every additional gallon of water removed by any junior water right holder has a negative impact and arguable impairs nearby senior right holders, in the long run at least.

In Kansas, groundwater mining is occurring in the large aquifers located in far Western and South Central Kansas. Our mining problems have arisen despite the existence of a reasonably clear water law that establishes and respects property rights and ostensibly protects the public interest.

Throughout the world, groundwater mining is taking place.[9] Yet there are locations where mining has not yet started, but is likely to begin sometime in the future due to increasingly greater demands being placed on the water resource everywhere. One might posit a simple four-category matrix of situations involving the interplay between aquifer over-exploitation and property rights.

Matrix of Over-drafting of Groundwater
Versus Existence of Water Rights Law

County A: No property system No over-drafting yet	County C: No property system Over-drafting already Example: Parts of India
County B: Property system in place No over-drafting yet Example: Kansas prior to 1960s	County D: Property system in place Over-drafting despite property system Example: U.S., and specifically, Kansas

In one category, we have no groundwater mining yet, and no property rights law. A second category is one where aquifer mining is not yet occurring, but a well-established property law system exists. This was probably the Kansas situation prior to the 1960's. In another, we have mining, but no property rights law, as described in the paper by Katar Singh on the situation in parts of India.[10] And in the fourth, over-pumping exists under a system that recognizes property rights to use groundwater. This fourth category describes the current Kansas situation.

The object of this article is to describe the evolution of the Kansas situation and to discuss possible solutions to the groundwater mining problem, in an attempt to place the Kansas problem in context with others, and to show that creation of a property rights system in groundwater does not guarantee resolution of the groundwater mining problem and may even create obstacles to a solution. The article first describes Kansas water rights law and its place in property law, including how Kansas came to define a water right as a real property right. It then lays out some recent proposals to extend the life of the Ogallala Aquifer and discusses the primary, inherent legal problem with these concepts, the "takings" issue. The takings issue arises when the state orders a reduction in the annual quantity of water the holder of a water right may pump, leading the water right holder to claim Fifth Amendment compensation protection.[11] The main philosophical and policy issue treated is whether we should adopt policies to preserve water for future generations, which if done might require Kansans to pay for that preservation with taxes. I propose an approach that combines both government action and voluntary agreements among water right holders to curtail groundwater mining. Lastly, I make some suggestions to be learned from the Kansas experience.

II. KANSAS WATER RIGHTS LAW AND PROPERTY RIGHTS

Kansas became a state in 1861 and immediately adopted the common law by statute.[12] The common law at that time for water resources was the riparian doctrine for rivers and the absolute ownership doctrine for groundwater. The Kansas Supreme Court handed down opinions from statehood until 1944 declaring the continued applicability of these water law doctrines.[13] In 1944, the court decided *State, ex rel Peterson, v. Board of Agriculture*,[14] adopting the absolute ownership doctrine and recognizing that the overlying landowner owned the groundwater underneath the land. The case led the governor to appoint a task force to study the laws of Kansas and to make recommendations about whether we should change to a different system.[15]

That Kansas might consider another water law doctrine is not surprising considering Kansas' location in the United States. Lying in the center of the country, on the line of demarcation between the East and the West for purposes of surface water

law doctrines, Kansas itself is a kind of microcosm of the United States as a whole, with semi-arid land in Western Kansas (receiving16 inches of annual rainfall) changing to more humid areas in Eastern Kansas (receiving 40 inches of annual rainfall in Southeast Kansas). An earlier case had ruled that despite this geographic disparity in precipitation, Kansas courts could not adopt two different types of water law, one for the East and one for the West.[16] The 1944 Governor's Task Force Report recommended that Kansas make a wholesale change from the riparian and absolute ownership doctrines to the prior appropriation doctrine. This change would bring us into conformity with all Western States for surface water, but would place us with fewer other states that apply prior appropriation to groundwater.

The Kansas Legislature accepted these recommendations and adopted the Kansas Water Appropriation Act of 1945 (the Act). The Act made significant changes in our water law. It provided that the chief engineer of the Division of Water Resources (DWR) of the State Board of Agriculture was to administer the Act.[17] It declared "all water within the state" to be dedicated to the use of the people of the state.[18] From the effective date of the Act, any person seeking a right to use water, except for domestic use (defined in the Act), had to apply for and obtain a permit. Rights of people already using water under the riparian doctrine or the absolute ownership doctrine were recognized as "vested rights" to continue the use as before 1945.[19] Water right holders not using their rights lost their water rights, but were given a cause of action for damages against appropriators.[20] Persons obtaining appropriation permits after the effective date could perfect their rights by constructing diversion works and putting the water to beneficial use. Junior water rights had to give way to senior rights in times of conflict.[21] Both groundwater and surface water could be appropriated, but any rights derived were to the "use" of the water, and did not constitute ownership of the water itself.[22]

Interestingly, the original 1945 Act did not expressly state that the appropriation rights were "property rights." Under general notions of American water law, water rights were recognized as property rights,[23] usufructuary in character. Professor Shurtz, who analyzed the Act in a 1956 booklet,[24] made cogent observations in recommending that the legislature amend the Act to define water rights as "real property rights."[25] He noted that while early statutes had made water rights appurtenant to land, the Act had failed to pick up the appurtenance language.[26] He concluded that "the legislature might wish to incorporate into the appropriation act a section defining the characteristics and attributes of water rights in general so that no misunderstanding can result."[27]

The legislature complied with Shurtz's suggestion and created a new definition in 1957:

> 'Water right' means a vested right or appropriation right under which a person may lawfully divert and use water. It is a real property right appurtenant to and severable from the land on or in connection with which the water is used and such water right passes as an appurtenance with a conveyance of the land by deed, lease, mortgage, will, or other voluntary disposal, or by inheritance.[28]

From 1957 to the present, Kansas has recognized that water rights are real property rights, to be dealt with like real estate—with deeds for conveyances and mortgages for security interests, with rights treated as real estate for *ad valorem* taxation, and with the applicability of the Statute of Frauds requiring contracts of sale to be in writing.

The fact that Kansas statutes expressly define water rights as real property interests, however, does not mean that water rights are exactly like land. Water rights differ in many respects.[29] A water right is a usufruct—which means that an owner has a right to use the water, but does not have absolute ownership of it.[30] The Act dedicates the water resource to the use of the public.[31] Water rights in excess of the reasonable needs of the appropriators are not allowed, and water rights are subject to the principle of beneficial use.[32] Water rights are subject to being administered in favor of more senior water rights.[33] Water rights can be lost for non-use without a valid reason.[34] Water rights are subject to express conditions imposed by the Act and stated in the permit at the time of issuance, such as a stipulation that the right cannot unreasonably impair existing rights (either quality or quality) or the public interest.[35] The chief engineer can further condition water rights in other ways to protect the public interest.[36] Other distinguishing features include the

> common nature of the resource (which is shared not only by water right holders and other consumptive users, but also by *in situ* uses such as fish and wildlife, aquatic and riparian habitat, water quality, and other environmental uses . . . [and] hydrologic variability and consequent uncertainties regarding the availability of water for diversion, storage, and distribution . . . .[37]

III. THE PROLIFERATION OF WATER RIGHTS SINCE 1945 AND KANSAS' RESPONSE TO THE PROBLEM

Since 1945, Kansas water users have applied for more than 45,000 permits to appropriate water, with around 30,000 being in active use. In addition to these, the Act allows domestic rights,[38] which need not be recorded. Furthermore, DWR has

recognized approximately 2,000 "vested rights," as permitted by the Act.[39] About 87 percent of the water used in Kansas is devoted to irrigation water use,[40] and most of this use is in Western Kansas, the location of the large Ogallala Aquifer that underlies parts of eight states.[41] DWR issued numerous new permits during the 1950s and 1960s. As a result, pockets of groundwater mining began to exist. These small areas have grown to include large areas, which has led to the closure of many parts of Kansas to new appropriation permits.[42]

Recognizing the problem, the 1972 Kansas Legislature passed enabling legislation for the creation of groundwater management districts (GMDs) for the following express purposes: "for the conservation of groundwater resources; for the prevention of economic deterioration; for associated endeavors within the state of Kansas through the stabilization of agriculture; and to secure for Kansas the benefit of its fertile soils and favorable location with respect to national and world markets."[43] The legislature also expressly stated the twin policies of preserving basic water law doctrine and establishing the right of local water users to determine their destiny with respect to the use of groundwater.[44] After the passage of the GMD Act in 1972, citizens formed five GMDs in Western and South Central Kansas, covering roughly one-fourth of the State of Kansas.

The chief engineer, based on GMD recommendations, began to promulgate regulations that would help extend the life of the aquifers. Regulations on well spacing,[45] prohibitions against waste of water,[46] metering requirements,[47] and safe yield and depletion formulas[48] are examples. However, the safe yield and depletion formulas were applicable only to new applications for permits, not to existing water rights. In other words, while the safe yield and depletion formulas may have slowed the rate of mining, they came into existence too late to stop mining in many locations—on the other hand, they were never intended to stop mining.

Part of the GMD Act focused on even more serious problem areas. The GMD Act gave the chief engineer the power, after notice and a hearing, to establish "intensive groundwater use control areas" (IGUCAs) within or outside the boundaries of GMDs.[49] Inside an IGUCA, the chief engineer would have not only normal administrative regulatory power already held under the Kansas Water Appropriation Act, but also the extraordinary power of "reducing the permissible withdrawal of groundwater by any one or more appropriators there, or by wells in the [IGUCA]."[50] Since the mid-1970s, the chief engineer has established several IGUCAs, one of which is particularly relevant to this article.

IV. THE WALNUT CREEK IGUCA

The Walnut Creek IGUCA, established in 1992, created great public interest. Near the town of Great Bend in West Central Kansas lies the Cheyenne Bottoms, a wildlife area that is one of the important migratory bird stopover spots in the Northern Hemisphere. The Cheyenne Bottoms requires additional water beyond its normal supply to maintain sufficient quantities for these birds during their migration. In 1948 and 1954, the Kansas Fish and Game Commission (now Kansas Department of Wildlife and Parks (KDWP) obtained two large appropriation rights for surface water from two nearby rivers, Walnut Creek and the Arkansas River, respectively.[51] Between 1949 and the late 1980s irrigators and other users obtained more than 700 permits for water rights from both alluvial groundwater and surface water in the Walnut Creek Basin, which lies west of the Cheyenne Bottoms. As a result, KDWP was unable to satisfy its rights to water from Walnut Creek during times of drought, due in part to the alleged connection between the alluvial groundwater and the river water and in part to the retention structures in the basin such as watershed district lakes and farm ponds. DWR could either administer the junior water rights (in other words, enforce the first in time, first in right principle, by shutting down junior right holders in inverse order of priority) or attempt to establish an IGUCA under which the chief engineer could otherwise protect the KDWP water rights.

After extensive and lengthy public hearings in 1990 and 1991, which included twelve parties,[52] the chief engineer established an IGUCA. In the IGUCA order,[53] the chief engineer determined that the safe yield of the basin was 22,700 acre feet per year, while annual pumping was almost double that amount. The Order left all vested rights at their then-authorized quantities. It left KDWP's water right alone. The Order then reduced the annual pumping of all other water rights, both stream water rights and alluvial rights, to achieve safe yield in the basin. The Order did not administer the rights under a strict priority basis—in other words, it did not order a total curtailment of pumping of the junior-most rights and moving up the priority ladder until the more senior rights could pump their rights in full. Instead, the chief engineer ordered a kind of "mass allocation" or sharing of the burden. The order created two large groups of water right holders—"Senior Rights" and "Junior Rights," with Senior Rights defined as those with priority dates on or prior to October 1, 1965 and Junior Rights defined as those since that date. Even Senior Rights for irrigation use had to cut back from between 22 and 33 percent, depending on their location in the basin, on the basis that all water users could make a more reasonable and efficient use of the water. Junior Rights for irrigation use were more drastically curtailed, from 64 percent to 71 percent, again depending on location. Reductions for Junior Rights were in part based on reasonableness and efficiency and in part on achieving safe yield in the basin.

Municipal and other rights also had to absorb some reductions. The overall goal of the Chief Engineer was to achieve safe yield in the basin with these cutbacks.

V. THE RATTLESNAKE CREEK MANAGEMENT PROGRAM

A similar and nearby water basin is the Rattlesnake Creek Basin, southeast of the Walnut Creek Basin. Established in 1959, the Quivira National Wildlife Refuge is a wetlands area operated by the U.S. Fish and Wildlife Service. Like Cheyenne Bottoms, it serves as an important migratory bird stopover point. The ponds and wetlands require supplemental water via a canal from Rattlesnake Creek, especially during portions of dry years when irrigation from groundwater reduces surface water flows.

Recognizing the results of the Walnut Creek IGUCA Order and foreseeing a similar IGUCA imposed on them, the water users in the Rattlesnake Creek Basin began in 1993 an attempt to solve similar problems of satisfying the early water right of the U.S. Fish and Wildlife Service by negotiation and agreement rather than by an IGUCA. In 1994, four entities signed the Rattlesnake Creek Basin/Quivira Partnership Agreement. The entities and their express objectives were as follows: 1) The U.S. Fish and Wildlife Service (assure adequate water for the management of Quivira National Wildlife Refuge); 2) DWR (manage the water according the Act); 3) Big Bend GMD No. 5 (preserve and manage sustained yield of water for all water users in the basin); and 4) the Water Protection Association of Central Kansas, Water PACK (manage and encourage the conservation of water within the basin to meet the needs of irrigated agriculture and other water users in the basin).[54] With a cooperative approach in mind, the partners sought "to develop and implement solutions to water resources problems within the . . . basin,"[55] thus reconciling their disparate objectives.

On June 29, 2000, the Partnership announced the Rattlesnake Creek Management Program.[56] The goals of the Program included "long-term sustainable management in the Rattlesnake Creek sub-basin" by "stabiliz[ing] the decreasing trend in streamflow in the short term and improv[ing] streamflow in the future"; "stabiliz[ing] groundwater declines and, over the long term, improv[ing] groundwater level trends"; and "reduc[ing] the potential for further mineral intrusion into freshwater sources and improv[ing] water quality."[57] Three geographic areas are the focus of these goals, the Stream Corridor Area, the Groundwater Management Area, and the Mineral Intrusion Area.[58]

The Program consists of a number of ambitious strategies, some of which have required legislative action. A water rights purchase program using state cost share assistance would permanently reduce water use. Water banking would enable some

water users to deposit unused water and others to lease water.[59] A "Five-Year Water Rights Program" would allow more flexibility to water right holders to use more water when needed and less when not needed.[60] Another strategy called for rate and quantity limitations on water rights to be "strictly enforced."[61] The Program contained several other strategies.[62]

VI. RECENT PROPOSALS TO EXTEND THE LIFE OF THE OGALLALA AQUIFER

The Walnut Creek IGUCA covers only a small alluvial aquifer. The Rattlesnake Creek basin is similarly small. Concern continues to mount over the dwindling supplies in the large Ogallala Aquifer due to mining of the aquifer, leading to various proposals. One such proposal was the "Two-Pool" Concept proposed in January 2001.[63] An upper pool, the "useable pool," would be available for current holders of water rights, until exhausted. The reserved, lower "conservation pool" would be more heavily regulated, would have to satisfy safe-yield criteria, and would be available for drinking water and other basic needs. Due to variations in the depth to the aquifer and thickness of the aquifer, the thicknesses of the two pools would differ throughout the aquifer. In July 2001, this concept was terminated due to opposition from Western Kansas.

A subsequent proposal, (the 2001 Ogallala Proposal), dated October 16, 2001, contained five recommendations, along with seventeen "Guiding Principles."[64] The following are three of the recommendations: 1) Delineation of the Ogallala Aquifer into aquifer subunits to allow management decisions in areas of similar aquifer characteristics, 2) identification by the GMDs and DWR of each aquifer subunit in decline or suspected decline and establishment of water use goals to extend and conserve the life of the Ogallala Aquifer, and 3) identification of aquifer subunit priorities to extend the life of the aquifer and sustain the vitality of western Kansas. Of the two proposals, only the Two-Pool Concept appears to contain any hint of governmental coercion.

VII. LEGAL PROBLEMS WITH THESE CONCEPTS: CLAIMS OF "TAKINGS" OF PROPERTY

The Fifth Amendment's protection of property against governmental takings without compensation includes water rights, even though they are usufructuary in character. For example, when the U.S. condemned land and appurtenant water rights

for the purpose of building flood control dams in Kansas, the U.S. had to pay the land owners and water right holders the market value of the property taken.

A more difficult question arises in "inverse condemnation" when the government affects property in a negative way in its regulation of property, but when the government is not actually acquiring title of the property for public purposes.[65] Numerous inverse condemnation cases have come down in the last century, both water rights cases and other types of cases. In addition, legislative changes such as those in Kansas and Arizona have raised takings issues.

A. Takings Law and Water Rights

Cases from the United States Supreme Court since 1978 provide some guidance. *Penn Central Transportation Company v. New York City*[66] stands for the proposition that whether there has been a taking depends on the circumstances of the case, and relevant factors include the economic impact on the claimant and the extent to which the regulation has interfered with distinct investment backed expectations, the character of the government action (such as a physical invasion), and the nature of the property interest involved. The Court found no taking in *Keystone Bituminous Coal Association v. DeBenedictis,*[67] which involved a state legislature's attempt to prevent further land subsidence by restricting the amount of coal that could be extracted. Such legislation seeks to protect the public health, safety, and general welfare, and the state is merely restraining uses of property that are tantamount to public nuisances. In *Lucas v. South Carolina Coastal Council,*[68] the U.S. Supreme Court held that there is a taking requiring compensation when regulations deny all "economically viable use of land."[69] However, no compensation is required if the state's regulation simply makes explicit what already "inhere[s] in the title itself, in the restrictions that background principles of the State's law of property and nuisance already place upon land ownership."[70]

Most of the water rights takings cases have been decided by state courts. In the 1938 Nebraska case of *Enterprise Irrigation District v. Willis,*[71] the court held that a vested water right for 3.5 acre feet /acre could not be reduced to 3.0 acre feet/acre by the state if the water use was reasonable.

Enterprise may have represented the general law of "takings" of water rights at that time, but significant encroachments on this idea have emerged. In the 1983 case of *National Audubon Society v. Superior Court of Alpine County,*[72] the California Supreme Court held that while the California Water Resources Board has power to grant "usufructuary licenses" that allow appropriators to take water, it cannot make an absolute, irrevocable grant of a water right. The state has "an affirmative duty to take the public trust into account in the planning and allocation of water resources."[73] Accordingly, the state can "reconsider allocation decisions even though those decisions were made after due consideration of their effect on the public trust."[74]

In 1990, a California appellate court decided *Imperial Irrigation District v. State Water Resources Control Board.*[75] The court held that the district had vested rights only to the "reasonable" use of water and that it had no right to waste or misuse water. "It is time to recognize that this law is in flux and that its evolution has passed beyond traditional concepts of vested and immutable rights."[76]

The legislature of the State of Arizona has approached its groundwater mining problems in a more comprehensive way. Under a groundwater statute enacted in 1980, the legislature established five management periods to control, limit, and ultimately curtail overpumping over a 45-year period in a kind of "step-by-step" approach. In *Town of Chino Valley v. City of Prescott,*[77] the Arizona Supreme Court upheld the constitutionality of the Act in a claim that the Act had effected a taking of property for which compensation was due.

Deviating from this line of cases, however, is a recent and important takings case, *Tulare Lake Basin Water Storage District v. United States,*[78] a case from the United States Court of Claims. The water storage districts had contracts with the state to purchase water from the State Water Project. Under the Federal Endangered Species Act (AESA"),[79] federal agencies restricted water availability to protect salmon and delta smelt. As a result, the water storage districts lost thousands of acre feet of water per year. The districts sued the United States for compensation. The court held that the United States must compensate holders of water contracts when it imposed on them ESA requirements to protect fish species resulting in curtailing water quantities otherwise available under the water contracts. This case has been criticized.[80] It represents a possible shift in thinking, away from the views expressed in California and Arizona cases.

Kansas has had no direct takings cases of the *National Audubon* type. In four cases, however, the Kansas Supreme Court has upheld the constitutionality of the 1945 Water Appropriation Act, against claims of takings.[81] These claims have generally been based on the proposition that when a state revamps its water law to take away water rights from holders of those rights who were not using water, this change amounts to a taking because prior to 1945 people could hold un-used water rights and not lose them by mere non-use. The court has disagreed. On the other hand, in a 1990 case,[82] the Kansas Supreme Court declined to adopt the Public Trust Doctrine as was done in *National Audubon.*[83] While not a water rights takings case, it does show the court's unwillingness to adopt the doctrine California had used to clothe the state administrative water agency with power to reduce water right quantities. At the administrative law level, Kansas has the Walnut Creek IGUCA case[84] mentioned above. Although the irrigators initially appealed that administrative decision, they settled the case before a court could determine the constitutional takings issues.

B. Summary of Water Rights Takings Law

Water rights are real property rights, but they differ from real estate in a number of significant ways. Takings cases involving property other than water rights have helped describe when property owners can claim a taking for governmental intrusion by way of strict regulations that diminish the use of property. The taking has to be extensive, either a physical invasion of property or one practically amounting to a loss of all economically viable use of land. An early water law case held that a state's cutting back on water rights amounted to a taking,[85] but the trend has been in the other direction since the 1980s with the application of the Public Trust Doctrine, the enforcement of requirements that water use be reasonably and without waste, and the establishment of legislatively-designed incremental cut-backs over time on water rights to achieve aquifer sustainability. The Arizona solution seems to imply that the less the state can make the regulation appear to be an immediate taking of property, the better the chance of the regulation's being constitutional; thus, delaying the taking helps, either to a future time certain, or in incremental steps.[86] Whether the 2001 *Tulare* case represents a real change in course or a bump in the road cannot be known yet. Kansas itself has no real inverse condemnation cases involving water rights, despite the four cases that have upheld the 1945 Water Appropriation Act against constitutional attacks. The Kansas Supreme Court has expressly rejected the Public Trust Doctrine in a non-water rights case, and yet the Chief Engineer's Walnut Creek IGUCA Order protecting the Cheyenne Bottoms cut back significantly on existing water rights.

VIII. TAKINGS LAW APPLIED TO THE WALNUT CREEK IGUCA ORDER, THE TWO-POOL APPROACH, AND THE 2001 OGALLALA PROPOSAL

Did the Walnut Creek IGUACA Order amount to a taking of property, and would the proposed Two-Pool Approach or the 2001 Ogallala Proposal amount to a taking? The answer is not clear.

A. The Walnut Creek IGUCA Order[87]

The Order cut back all water rights junior to rights held by the Kansas Department of Wildlife and Parks: "Senior Rights," those with priority dates prior to October 1, 1965, were cut from 22 percent to 33 percent, depending on their location, and "Junior Rights," those with priority dates subsequent to that date, were cut from 64 percent to 71 percent depending on location. At first glance, these reductions would appear to be potential takings for which compensation might be due, at least on the

rationale of *Enterprise Irrigation* [88] and *Tulare Lake*.[89] However, if one accepts the proposition that the chief engineer has the power to control and reduce waste,[90] the Order's reduction might stand. The ground for the reduction of the Senior Users was that the annual quantities they ended up with were all they really needed, if they would use efficient irrigation methods.[91] The same would hold true for the Junior Users, at least to the extent that their reductions were grounded on waste reduction and efficiency. Reductions on Junior Users went further, however, in order to achieve safe yield in the basin.

Arguably the entities who might have successfully claimed a taking in this case would be the senior-most water right holders in the Junior Rights category. After all, they obtained their water rights under the assumption that the "first in time" concept meant that they could use their rights until they impair senior rights and then they would be shut down completely in favor of those rights. They assumed that their rights would continue in full force, however, and would not be subject to curtailment before DWR administered more junior rights. Here, however, the Order did not afford this protection to the holders of the senior-most rights of the Junior Rights. Instead, in a kind of "mass allocation,"[92] the Order essentially "shared" the burden of the safe yield cutback equally among all the Junior Users. No one was shut down completely; all Junior Rights bore some degree of curtailment. The Order thus used a kind of sharing concept that one might expect to find in a riparian doctrine or correlative rights doctrine state.

The Order appears to adopt a position similar to the solution shown in a 1949 California case, in which groundwater rights were cut back proportionately based on mutual prescription.[93] The claims of a taking by the junior right holders would be based on the regulation's interference with their investment-backed expectations. These right holders expected to be able to use a certain quantity of water annually, subject only to the existing law and to the conditions on the certificate. Moreover, all economical use of the reduced portion of the water right was lost.[94] It was tantamount to a physical invasion by the state in that the state took that quantity of water back into the state's pool, even for possible redistribution if at some future date state policy changes and the IGUCA Order is changed. The Junior Users' claim would be based only on the portion of the curtailment devoted to the safe yield goal, not to the portion devoted to eliminating waste and inefficiency.

B. The Two-Pool Approach[95]

The discarded Two-Pool Approach called for interested "communities"[96] and local organizations[97] to "provide input [and] also help decide the water management options for a healthy community and the time frame in which the large Usable Pool will be depleted."[98] "The volume of water . . . would not be managed for sustainable

yield. Instead, depletion that is currently occurring would be managed or limited by existing authorities and criteria."[99] Water in the Conservation Pool "would be administered according to prior appropriation,"[100] which would have to mean true and rigorous administration to create safe yield conditions. As the end of the Usable Pool approaches, water users absolutely needing water to survive (such as cities and domestic users) would have to purchase "senior rights that would allow them to withdraw from the conservation pool."[101] Management decisions would be made on small subunits "with similar aquifer characteristics."[102]

Regarding the upper Usable Pool, this approach does not appear to overstep any constitutional bound. Management decisions made on a "voluntary basis" by the communities involved would represent a true, voluntary agreement if all water users participate and if all water right holders consent to the management approach. On the other hand, an objecting senior user being curtailed by a group management decision could possibly claim either that this would amount to a taking or that the management decision violates the Act. It might amount to a taking, for the same reason that the holders of the Junior Rights in the Walnut Creek IGUCA might claim a taking—the objecting senior user's expectation of being curtailed only by impaired senior users was thwarted by a method not prescribed in the Water Appropriation Act. An example of the use by the group of existing law that might raise the takings issue would be the creation of an IGUCA, with a resulting order similar to those in the Walnut Creek IGUCA. The strict application of prior appropriation for the lower Conservation Pool should raise no problems, except perhaps for the question of the meaning of "impairment." The Two-Pool Concept envisions a new meaning of impairment, from the current view that impairment looks back in time at the effect a junior user has on a senior, to a view that impairment should look forward with the objective of protecting the Usable Pool as a whole and not just of protecting a senior user.[103]

C. The 2001 Ogallala Proposal

The 2001 Ogallala Proposal strives to solve the over-pumping problem through a totally voluntary approach. If all water right holders would voluntarily and permanently reduce pumping under existing water rights according to an agreement, there should be no constitutional takings problem.

IX. PHILOSOPHICAL-PUBLIC POLICY ISSUES

The above discussion assumes that the state should stop groundwater mining. Current GMD (groundwater management district) depletion formulas do not save the water; they merely extend the date the water will not be available. They demonstrate a

policy adopted by the residents of the GMDs that permit planned depletion. When the Kansas Water Office offered the Two-Pool Concept as a method of preserving water for future generations, "Western Kansans strongly resisted the proposal . . . and were skeptical as to the practicality of the 'two pools' idea . . . . Local community leadership did not acknowledge depletion was a priority problem."[104]

Statements and platitudes about protection and sustainability of natural resources and about "intergenerational equity" are found in case law;[105] political platforms;[106] the media;[107] environmental literature;[108] and legislation on environmental policy,[109] national wilderness,[110] wild and scenic rivers,[111] clear air,[112] clean water,[113] and endangered species.[114] However, because of the takings problems it is easier to preserve resources when they have not yet fallen into private ownership. Parks like Yellowstone National Park were reserved from the publicly owned lands that had never been owned by any entity other than the federal government. The Kansas Legislature, having in the words of one Kansas Supreme Court justice "communized" the water resource in 1945,[115] essentially placed Kansas in the same position with respect to its water as the federal government sits with respect to its federal public lands. Had the Kansas Legislature in 1945 not only adopted the appropriation system, but insisted then, expressly in the Act, that safe yield would be maintained, we would not have the groundwater mining today. On the other hand, we would not have the strong irrigation-based Western Kansas economy, on which farmers, related livestock industry, and many small communities and the state as a whole depend, and which has brought to Kansas numerous workers who have changed our cultural, ethnic, and socio-economic landscape.[116] Once land and other property are held in private ownership by individuals, the difficult problem becomes how to make it a public resource again. The government would theoretically have to purchase the property, whether land or water rights, to take it out of private hands. With water rights, however, the government could attempt to preserve at least a part of the water for future generations, not by actually condemning the water rights, but by cutting back the use of them and not taking title, which, if properly done would not be deemed a taking requiring compensation.

If one assumes that such regulation for the benefit of future generations would require government compensation, then the public policy issue becomes clearer. The taxpaying members of the public who clamor for water preservation for future generations would be faced with the dilemma of whether they are willing to pay to preserve the water for the future by being taxed today. Given Americans' lack of concern with other diminishing resources such as petroleum, it is doubtful that we would favor a policy of preserving water for future generations if we had to pay for that preservation directly with current tax dollars.

Philosophers, conservationists, and legal writers wrestling with the notion of intergenerational equity[117] show polar views[118] surrounding more moderate ones.

Rawls' "veil of ignorance" model[119] provides an interesting, theoretical framework for discussion and debate to deal with the problem.[120] Other such models are the Golden Rule,[121] Frankl's categorical imperative of logotherapy,[122] principles of the Appreciative Inquiry Dialogue,[123] methods of "final offer salary arbitration,"[124] or even the simple solution of the problem of dividing a piece of pie[125] and the Native American phrase, "in order to understand me, walk a mile in my moccasins" or just "stepping into another's shoes" in order to get their perspective. But they are not very practical in actually solving the intergenerational equity problem of groundwater depletion. Moreover, application of each of the models does not lead inevitably to the conclusion that all of the currently surviving groundwater resource should be saved for future generations at the expense of current users.

If one assumes that aquifer safe yield should be state policy, a fundamental question is this: Can totally voluntary arrangements by current water right holders lead to solutions for the depletion problem, or is government action a necessary part or impetus to a solution? Katar Singh reviewed experiences of co-operative management of groundwater, a successful one in California and a less successful one in Deoria district of Eastern Uttar Preadesh.[126] Other writers have described cases in which groups of people have shared water supplies for centuries.[127] However, the success stories seem to be few in number. If it is difficult for current users to reach an agreement among themselves due to the economic problems Singh describes, asking current water right holders to cut back on their use voluntarily in favor of the unknown future generation of residents and water users who are not physically sitting at the bargaining table would seem to be asking the impossible. In short, assuming *arguendo* that we do have a duty to preserve water for future generations, I do not have much faith in a voluntary resolution of the over-pumping problem based on altruistic views of intergenerational equity and sharing.[128]

For "voluntary" agreements to arise in Kansas, both a stick and a carrot may be required. The Rattlesnake Basin Agreement arose following, and as a result of, the Walnut Creek IGUCA Order. And, several years prior to the establishment of the Walnut Creek IGUCA and the consummation of the Rattlesnake Basin Agreement, the water users in still another Kansas basin also agreed to a solution after the Chief Engineer held IGUCA hearings.[129] Even the success story in Pasadena, California, described by Singh[130] and Ostrom[131] had an element of government intervention.

X. PROPOSED SOLUTION FOR KANSAS

If Kansas ever decides to preserve some groundwater for future generations, the solution must both work and be constitutional. Passing constitutional muster under a takings analysis seems to require that the solution contain several elements. The approach should prohibit waste and other unreasonable uses of water by cutting back annual quantities to amounts that represent reasonably necessary quantities for the type of use.[132] It should rely on the priority system as much as possible.[133] It should extend the time in which the regulations are to take place, either by using a step-by-step, graduated approach, similar to that of the Arizona groundwater statute, or by postponing its effective date to sometime in the near future.[134] Having DWR and the Kansas Water Office (KWO) involved in plan formulation and execution, either actively or passively, seems almost imperative.

The following proposed model combines several ideas from those described in this paper. Because I have serious doubts about the possibility of totally voluntary cooperative agreements, I suggest that government must be involved, but in a passive, background way—by using a precedent from one basin as an incentive that will lead to agreements for other basins. We have the Walnut Creek IGUCA as an example of how safe yield in a watershed can be achieved. The case was settled before an appeal was taken. As discussed above, there might just be some valid constitutional complaints from a few of the senior-most water right holders of the Junior Rights group, but until someone actually creates law to the contrary, the Order stands as a guide. Next we have the Rattlesnake Creek Basin Agreement that shows that the very existence of an IGUCA Order that portends similar treatment in a similar water basin can lead to cooperation and agreement among the interested parties. A long-term model would consist of an overall goal in Western Kansas of safe yield for some date in the future, say 25 or 40 years, to be reached incrementally. Small geographical areas sharing common hydrologic characteristics, perhaps modeled on the Walnut Creek and the Rattlesnake Creek Basins, would be identified by DWR and the KWO for future IGUCA designation, using the Walnut Creek Order as the guide. A date would be set for each area to seek an agreed solution such as the one completed in the Rattlesnake Basin. If the local group could not agree to a solution within the time schedule, DWR would proceed with IGUCA hearings. Ultimately all groundwater areas would be covered. This model is thus in part voluntary and in part imposed. It contains a time element similar to that in the Arizona Groundwater statutes, and government involvement similar to the California groundwater basin settlements.

XI. LESSONS TO BE LEARNED FROM THE KANSAS EXPERIENCE

Of the four situations found in the matrix described in the Introduction, obviously it would be easiest to solve the overpumping problem in areas where there is yet no law and no overpumping. However, in regions like those Singh described in India, with over-pumping, but no property rights system, and in regions like Kansas as described above, with over-pumping with a well-established property rights system, solving the problem is extremely difficult, with legal, economic, social, psychological, philosophic, and public policy ramifications.

The Kansas experience teaches that having property rights in place does not insure against the possibility of experiencing eventual over-pumping problems. The water rights administrative agency has to be vigilant prospectively in ensuring that water rights granted will not result in annual pumping quantities that exceed safe yield. If long-term aquifer sustainability was the goal, Kansas officials should have seen the problem as early as the 1960s and should have denied new permit applications then. Of course, but for the granting of all the irrigation permits, the Kansas economy would not have grown as it has. Irrigated corn and soybeans, the livestock industry, and the in-migration of foreign workers would never have occurred. Western Kansas would have remained an area devoted mostly to dry-land farming.

Countries seeking to establish a property system for water rights need to consider the nature of the property right being established. The Kansas water right is like real estate, but with the many limitations shown above. Water rights may need to be property rights to protect investments and the expectations derived by property ownership.[135] One attribute of a property interest might be changed, however, to provide expressly and at the outset for better governmental oversight—water rights would not have to be perpetual in nature to have value. A water right could be defined as a property right to be valid for a set number of years only, either term ownership or held under a term lease.[136] That way, the right has the most value when it is new. With a water right's life of 50 years, for example, the holder would typically have sufficient time to amortize the investment. Or, rights could be shorter for some types of water use, say 25 years for an irrigation right, 50 years for an industrial right, and 75 years for a municipal right.[137] The rights could be transferable, but as the termination date of the right approaches the value of the right would be diminishing. Upon the expiration of each right, the state would then have control of the quantity of water under that right. The state could hold it or grant a new right, as that new, future situation dictates. Lastly, the water right could be expressly conditioned at the outset to enable the state to order cutbacks for serious problems of public health and safety.[138]

Such a condition already exists in Kansas for water that might move across state lines.[139]

Important to all areas of the globe is the communication of new ideas for conservation and sustainability, both legal and technical. Conferences such as the World Water Forum and the annual meetings of organizations such as the American Water Resource Association, the Rocky Mountain Mineral Law Foundation, and the Universities Council on Water Resources bring together the people for such discussions. Obviously there is no one solution that fits all situations.

Notes

1. Katar Singh, Co-operative Property Rights as an Instrument of Managing Groundwater, paper presented at the World Water Council 3rd World Water Forum, 2002) (copy on file with author).
2. This game is based on the Prisoner's Dilemma. *See, e.g.*, R. AXELROD., THE EVOLUTION OF COOPERATION 7-10 (1984), and H. BUTLER, ECONOMIC ANALYSIS FOR LAWYERS 469-76 (1998).
3. *See California-Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U.S. 142, 55 S.Ct. 725, 79 L.Ed. 1356 (1935), stating:

   > [The Desert Land Act] . . . effected a severance of all waters upon the public domain . . . from the land itself * * * [A]ll non-navigable waters then a part of the public domain became *publici juris*, subject to the plenary control of the designated states * * * with the right to each to determine for itself to what extent the rule of appropriation or the common law rule . . . should obtain.

   Id. at 158-164.

   The U.S. Constitution places the power over interstate commerce in the federal government. Commerce includes river transportation, so generally the federal government controls navigable rivers and must keep them open for transportation. Moreover, the Supreme Court has recognized a broader power that has enabled the federal government to construct reservoirs on not only navigable streams, but also on the non-navigable tributaries of navigable streams. The federal government also retains power over water derived by constitutional clauses relating to the national defense, taxing in the public welfare, ownership of public lands, and treaties. Those exceptions aside, however, the states generally control the water resources within their borders. *See* G. GOULD & D. GRANT, CASES AND MATERIALS ON WATER LAW 607-13 (6th ed. 2000).
4. Under the riparian doctrine, landowners bordering rivers and streams have rights to the use of water by virtue of their land ownership. Water must be used on the riparian land, but failure to use the water does not result in a loss of the water right. Each user must accommodate other reasonable users upstream and downstream, both current and future, such that any given water right is neither secure nor definable in terms of annual use or withdrawal rate. Courts handle disputes among competing users. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS §§ 850 & 850A (1979). Many riparian states, however, have adopted permit systems. *See* THE REGULATED RIPARIAN MODEL WATER CODE, FINAL REPORT OF THE WATER LAWS COMMITTEE OF THE WATER RESOURCES PLANNING DIVISION OF THE AM. SOC. OF CIVIL ENGINEERS, 1997 (Joseph Dellapenna, editor): "[E]astern States have developed a highly regulated system of water administration based on

riparian principles that could best be described as a system of public property." *Id.* at Preface, v. These could be called "Easter permit systems," "non-temporal priority permit systems," or "regulated riparianism." *Id. See also*, DAVID GETCHES, WATER LAW IN A NUTSHELL 56-59 (3rd ed. 1997).

5. *See generally* Irwin v. Phillips, 5 Cal. 140 (1855).
6. A senior water right is a right with a priority date earlier than a junior right. For example, a right with a 1947 priority date would be a senior right vis-à-vis a 1951 right. The terms are relative however. While the 1951 right is junior to the 1947 right, the 1951 right is senior to most water rights in the state. What is often more important than the priority date or the number of the right is the priority date or number as compared to those same attributes of other *nearby* rights.
7. In absolute ownership doctrine states, the owner of land overlying an aquifer owns the water just as the owner owns the soil, so the owner can withdraw it and use it anywhere without being subject to liability to neighbors. Under the reasonable use doctrine, landowners must use the water in a reasonable way, and only on the landowner's own land. Correlative rights doctrine states recognize that landowners may use a proportionate share of the aquifer, correlative with others. Some states, like Kansas, use the prior appropriation doctrine for groundwater and for surface water. Section 858 of the Restatement of Torts, Second, suggests still another doctrine, which protects a person using groundwater from the person's land for a beneficial purpose, unless the withdrawal causes unreasonable harm through lowering of the water table.
8. Mining (also called over-drafting or over-exploitation) refers to groundwater being withdrawn at a greater rate than it is naturally being recharged, i.e., at rates greater than "safe yield." Kansas law defines safe yield as "the long-term sustainable yield of the source of supply, including hydraulically connected surface water or groundwater." KAN. ADMIN. REGS. § 5-1-1 (mmm) (2002 Supp).
9. *See, e.g.*, T. Shah et al., *The Global Groundwater Situation: Overview of Opportunities and Challenges*, INT'L WATER MGMT. INST. (2002), *available at.* http://www.cgiar.org/iwmi/WWVisn/GrWater.htm. The authors point out over-draft problems in China, India, Pakistan, Jordan, Yemen, and Mexico.
10. Singh, *supra* note 1.
11. This problem may not be a concern in countries that have no comparable constitutional protection for the governmental taking of property for public use.
12. 1855 KAN. TERR. LAWS, ch. 96; 1862 KAN LAWS, ch. 135; 1868 KAN. LAWS, ch. 119, § 3. This statute is still in force and is found at KAN. STAT. ANN. § 77-109 (1997).
13. *See, e.g., Shamleffer v. Council Grove Peerless Mill Co.*, 18 Kan. 24 (1877), and *Clark v. Allaman*, 71 Kan. 206, 80 P. 571 (1905).
14. 158 Kan. 603, 149 P.2d 604 (1944).
15. *See* THE APPROPRIATION OF WATER FOR BENEFICIAL PURPOSES, A REPORT TO THE GOVERNOR ON HISTORIC, PHYSICAL AND LEGAL ASPECTS OF THE PROBLEM IN KANSAS (Dec. 1944).
16. *Clark*, 71 Kan. 206..
17. GEN. STATS. OF KAN. 1935 § 82a-706 (1945 Supp.), now found at KAN. STAT. ANN. § 82A-706 (1997).
18. *Id.* at § 702.
19. *Id.* at § 701(d) 704a.
20. *Id.* at § 716. There are no cases annotated that indicate that this cause of action was ever used, or if so, that a case was ever appealed.
21. *Id.* at § 707(c), 717a.

22. *Id.* at § 707(a).
23. *City of Emporia v. Soden*, 25 Kan. 588, 604, 37 Am. Rep. 625 (1881).
24. *Report on the Laws of Kansas Pertaining to the Beneficial Use of Water*, Bull. No. 3, Kansas, Water Resources Board (Nov. 1956). Professor Earl Shurtz was a professor of law at the KU Law School at the time, and he taught a course in water law.
25. Specifically, Shurtz stated, "Persons interested in water law must ask themselves at the outset several questions with regard to the possible rights of their clients. They must ask whether water rights are property rights, and if so, what particular kind. They must ask whether such rights are assignable, inheritable, severable, etc." *Id.* at 75-76. In a subsequent part of the report, he said:

    > It would be unwise to treat an appropriation right, or any other water right, as a mere nontransferable, personal right. Death, bankruptcy, disability, and financial reverses would, under such a theory, destroy investments and impair development. * * * An appropriator deserves better treatment. His right deserves greater protection. Surely it should have the standing of real property with the attending attributes of real property.

    Id. at 84.
26. *Id.*
27. *Id.* at 83-84.
28. GEN. STAT. OF KAN. 1949 § 82a-701 (1957 Supp.), now found at KAN. STAT. ANN. § 82a-701(g) (1997).
29. Brian E. Gray, *Takings and Water Rights*, PROCEEDINGS OF THE ROCKY MOUNTAIN MINERAL LAW FORTY-EIGHTH ANNUAL INSTITUTE 23-1, 23-7 to 23-8 (2002).
30. KAN. STAT. ANN. § 82a-707(a) (1997).
31. *Id.* at § 702.
32. *Id.* at § 701(f), 706, 707(c) & (e), 711, 718, 733.
33. *Id.* at § 707 (c), 717a, 706b, & 706d.
34. *Id.* at § 718.
35. *Id.* at § 712, 711.
36. *Id.* at § 712.
37. *See* Gray, *supra* note 29, at 23-7.
38. Domestic use is the only use the Act expressly defines. Other definitions are found in KAN. ADMIN. REGS. § 5-1-1 (2001). KAN. STAT. ANN. § 82a-701(c) (1997) defines domestic use as

    > the use of water by any person or by a family unit or household for household purposes, or for the watering of livestock, poultry, farm and domestic animals used in operating a farm, and for the irrigation of lands not exceeding a total of two (2) acres in area for the growing of gardens, orchards and lawns.
39. KAN. STAT. ANN. § 82a-701(d), 704a (1997).
40. *Water Use in Kansas*, USGS Fact Sheet 090-99 (April 1999) *available at* http://ks.water.usgs.gov/Kansas/pubs/fact-sheets/fs.090-99.html.
41. South Dakota, Wyoming, Colorado, Nebraska, Kansas, Oklahoma, New Mexico, and Texas.
42. *See., e.g.*, KAN. ADMIN. REGS. § 5-23-4a & 5-23-4b (2001 Supp.) (townships were closed in the Southwest Kansas Groundwater Management District No. 3).
43. KAN. STAT. ANN. § 82a-1020 (1997).
44. *Id.*
45. *See, e.g.*, KAN. ADMIN. REGS. § 5-23-3 (2001).
46. *See, e.g., id.*, at § 5-23-2.
47. *See, e.g., id.*, at § 5-23-6.

48. *See, e.g., id.*, at §§ 5-22-7, 5-23-4.
49. KAN. STAT. ANN. § 82a-1036 (1997).
50. *Id.*, at § 1038.
51. Water Right File No. 439, certified on September 13, 1990, is for 19,175 acre feet per year at 500 cubic feet per second (cfs), for surface water from Walnut Creek, with a priority date of October 18, 1948. Water Right File No. 2,427, certified on August 15, 2000, is for 18,185 acre feet per year at 80 cfs, for surface water from the Arkansas River, with a priority date of April 9, 1954.
52. The hearings were held in the Great Bend Holiday Inn, beginning in December 1990. *See* J. Peck, *The Cheyenne Bottoms: A case study of water conflicts in the 1990's*, 4 AGRIC. L. UPDATE , vol. 8 no. 7, whole number 92 (April 1991). The parties were the KDWP, Big Bend Groundwater Management District No. 5, Walnut Creeks Basin Association, City of Great Bend, Kansas Wildlife Federation, Mid-Kansas Quality Water Association, Kansas Natural Resource Council, the Kansas Audubon Council, Central Kansas Utility Co., Inc., City of Hoisington, Kansas Farm Bureau, and Wet Walnut Creek Watershed Joint District No. 58.
53. Order, *In the Matter of the Designation of an Intensive Groundwater Use Control Area in Barton, Rush and Ness Counties, Kansas*, Division of Water Resources (January 29, 1992) [hereinafter Walnut Creek IGUCA Order]. For a summary of the proceedings and the Order, see J. Peck, *Water Law, 1992 Kansas Annual Survey*, KANSAS BAR ASSOC. (1992).
54. Rattlesnake Creek Basin/Quivira Partnership Agreement, Partners Objectives, June 1994 (on file with author).
55. *Id.*, at Goals of Partnership.
56. Rattlesnake Creek/Quivira Partnership, *Rattlesnake Creek Management Program Proposal* (June 29, 2000) ([hereinafter *Management Program*].
57. *Id.* at 3- 4.
58. *Id.*
59. The legislature enacted water-banking legislation in 2001. *See* KAN. STAT. ANN. §§ 82a-761 to 773 (2002 Supp.)
60. *Management Program, supra* note 56. *See* KAN. STAT. ANN. § 82a-736 (2001 Supp.), and KAN. ADMIN. REGS. § 5-16-1, *et seq.* (adopted Oct. 11, 2002).
61. *Id.* at 11.
62. These were conservation practices and irrigation management; voluntary removal of end guns; water appropriation transfers, replacement wells in the mineral intrusion area, augmentation, and low head dams. *Management Program, supra* note 56.
63. *A New Idea for Managing the Ogallala Aquifer for the Future, Issue Fact Sheet 2001*, Kansas Water Office & Kansas Department of Agriculture/Division of Water Resources (copy on file with author) [hereinafter *New Idea*].
64. Ogallala Aquifer Management Advisory Committee, *Discussion and Recommendations for long-term management of the Ogallala Aquifer in Kansas* (October 16, 2001) (copy on file with author).
65. *See generally,* Joseph L. Sax, *The Constitution, Property Rights and the Future of Water Law*, 61 U. COLO. L. REV. 257 (1990).
66. 438 U.S. 104, 98 S.Ct. 2646, 57 L.Ed.2d 631 (1978). The claim of the owners of Grand Central Station that their property was taken was denied. The owners claimed that a law enacted to preserve historic buildings, thereby severely restricting the use of the property such as building a high rise on the property, amounted to a taking. The Court found no taking because this law did not interfere with present uses, the owner could use some of the air space, and under the law the owner could transfer some of the development rights to others.

67. 480 U.S. 470, 107 S.Ct. 1232, 94 L.Ed.2d 472 (1987). The coal companies' takings claim was countered by evidence showing that the restrictions amounted to only two percent of their holdings.
68. 505 U.S. 1003, 112 S.Ct. 2886, 120 L.Ed.2d. 798 (1992). South Carolina had imposed coastal zone permit requirements that had resulted in keeping plaintiff from building any permanent structures on his land.
69. *Id.*, at 1016.
70. *Id.*, at 1029.
71. 284 N.W. 326 (Neb. 1939). The court stated that the quantity of a water right is as important as the priority and that "while vested rights may be interfered with within reasonable limits under the police power . . . any interference that limits the quantity of water . . . , is more than a regulation and supervision and extends into the field generally referred to as a deprivation of a vested right." *Id.*, at 330.
72. 33 Cal.3d 419, 189 Cal. Rptr. 346, 658 P.2d 709 (1983). Los Angeles held 1940 water rights from freshwater streams flowing into Mono Lake, a saline lake located several hundred miles away. But by 1970, Los Angeles was taking all the water from these streams, causing the lake level to drop so low that coyotes and other predators were forcing gulls to leave the island, and causing the loss of scenic beauty and ecological values. The Audubon Society sued to enjoin diversions on the theory that the shores, bed, and waters of the lake were protected by the Public Trust Doctrine.

    The U.S. Supreme Court had recognized this doctrine in an 1892 case, *Illinois Central Railroad Co. v. Illinois*, 146 U.S. 387, 13 S.Ct. 110, 36 L.Ed. 1018 (1892), in revoking a grant of a port site along Lake Michigan (navigable waters) in Chicago from the state to a privately held railroad corporation.
73. *National Audobon Society*, 33 Cal.3d at 446.
74. *Id.* at 447.
75. 225 Cal. App.3d 548, 275 Cal. Rptr. 250 (1990). In that case, an irrigation district with vested rights was losing up to 153,000 acre feet/year through "canal spill" and up to 559,000 acre feet/year from excessive tailwater.
76. *Id.* at 267.
77. 131 Ariz. 78, 638 P.2d 1324 (1981).
78. 49 Fed. Cl. 313 (2001).
79. 16 U.S.C. § 1531 *et seq.* (2003).
80. *See, e.g.*, Cori S. Parobek, *Of Farmers 'Takes and Fishes' Takings: Fifth Amendment Compensation Claims When the Endangered Species Act and Western Water Rights Collide*, 27 HARV. ENVTL. L. REV. 177, 206-25 (2003). *See also* Melinda Harm Benson, *Taking? Not So Fast . . .*, 13 NRLI NEWS 1, 6 (Summer/Fall 2002).
81. *State ex rel. Emery v. Knapp*, 167 Kan. 546 (1949) (concerning the Bostwick Irrigation District on the Republican River; Act upheld, no objection being made to § 702, which declared all water to be dedicated to the use of the public); *Bauman v. Smrha*, 145 F.Supp 617 (D.Kan. 1956) (federal district court relied on *Emery* and upheld the Act in case involving groundwater in Wichita-Harvey County area); *Williams v. Wichita*, 190 Kan. 317 (1962) (a landowner whose water table was declining due to Wichita's well fields challenged the aspect of the act allowing taking of unused water rights; held: Act constitutional, no compensatory taking); *F. Arthur Stone & Sons v. Gibson*, 230 Kan. 224 (1981) (constitutionality of the Act upheld despite new law requiring permits and making it a criminal offense to divert water without a permit).
82. *State ex rel Meek v. Hays*, 246 Kan. 99 (1990).
83. *See* text accompanying notes 72-74, *supra*.

84. *See* text accompanying notes 52-53, *supra.*
85. *See* Enterprise Irrigation Dist. v. Willis, 284 N.W. 326 (Neb. 1939).
86. *See* John C. Peck, & Doris K. Nagel, *Legal Aspects of Kansas Water Resources Planning*, 37 KAN.L. REV. 199, 276-280 (1989).
87. The chief engineer signed the Order January 29, 1992. *See* text accompanying notes 52-53.
88. *See* text accompanying note 71, *supra.*
89. *See* text accompanying notes 78-80, *supra.*
90. KAN. STAT. ANN. § 82a-706 (1997) requires the chief engineer to conserve and regulate the water resources of the state. KAN. ADMIN. REGS. § 5-5-7 (2000) prohibits the waste of water. *See also* text accompanying notes 75-76, *supra.*
91. "The reasonable average annual amount of water needed to be diverted for irrigation within the IGUCA is approximately 12 inches in Barton County, 13 inches in Rush County and 14 inches in Ness County . . . ." Walnut Creek IGUCA Order, *supra* note 53, Conclusions, § 21.
92. *See Nebraska v. Wyoming*, 325 U.S. 589, 65 S.Ct. 1332, 89 L.Ed. 1815 (1945), for an example of "mass allocation" adopted by the U.S. Supreme Court in an interstate water dispute.
93. *City of Pasadena v. City of Alhambra*, 33 Cal. 2d 908, 207 P.2d 17 (1949). Kansas, however, does not recognize water rights by prescription. *See* KAN. STAT. ANN. § 82a-705 (1997).
94. Technically, these were not absolute, final reductions. The Order reduced the water rights based on five-year averages and established an advisory committee to make recommendations concerning types of data collection and "modifications to the corrective control provisions as deemed appropriate to optimize the efficient use of water and benefits from the use of water in the area consistent with the protection of existing water rights and the public interest." Walnut Creek IGUCA Order, *supra* note 53, Order, §§ 7, 8, 9, & 21.b.
95. *See* text accompanying note 63, *supra.*
96. Communities include water users: irrigators and other producers, businesses, cities and towns, industries, and "[i]ndividuals who rely on water." *New Idea*, *supra* note 63, at 2.
97. These local organizations include "groundwater management districts, watershed and conservation districts, and basin advisory committees." *Id.*
98. *Id. See* text accompanying note 63.
99. *New Idea*, *supra* note 63, at 5.
100. *Id.* at 3.
101. *Id.*
102. *Id.*
103. Phone conversation with Thomas L. Huntzinger, Division of Water Resources, State Department of Agriculture, February 11, 2003. *See Baker v. Ore-Ida Foods*, 513 P.2d 627 (Idaho 1973) for an example of management of a finite aquifer by closing down all junior rights to a level such that safe yield would be attained.
104. S. Stover *et al.*, Allocating and Managing Water for a Sustainable Future: Lessons from Around the World, Presentation at the 23rd Summer Conference, Natural Resources Law Center, University of Colorado School of Law (June 11-14, 2002) (copy on file with author).
105. In arguing that the public interest requires "stopping unjust impoverishment of future generations," Justice Jackson observed that "the wealth of Midas and the wit of man cannot produce or reproduce a natural gas field." *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591, 64 S.Ct. 281, 88 L.Ed. 333 (1944).
106. For example, the 2000 Democratic National Platform stated:

> Democrats know that for all of us there is no more solemn responsibility than that of stewards of God's creation * * * We have to do what's right for our Earth because it is the moral thing to do. It involves . . . securing for our grandchildren the expectation of a joyful array of seasons that we took for granted when we grew up * * * [W]e must . . . reduce . . . pollution . . . in order to preserve the Earth .

2000 Democratic National Platform, *available at* http://www.democrats.org/about/2000platform.html

107. *See, e.g.*, G. Polakovic, *Earth's natural resources at risk, study finds*, PIONEER PRESS, June 25, 2002, *available at* http://=www.twincities.om/mld/pioneerpress/news/world/3537478.htm.
108. *See, e.g.*, C. Pope, *Ways & Means: Selling a Sustainable Future*, SIERRA MAG. (Sept./Oct. 2000), *available at* http://www.sierraclub.org/sierra/200009/ways.asp: "Against the commercial dream of boundless plenty and reckless consumption we need to use storytelling, art, and, yes, even marketing to sell our competing vision of balance and diversity and a planet we can pass along whole to our grandchildren."
109. National Environmental Policy Act, 42 U.S.C. § 4321 (2003): The purpose is "[t]o declare a national policy which will encourage . . . harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment."
110. The policy of the Wilderness Act, 16 U.S.C. § 1131 (2003), is "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness," and to * * * leave them unimpaired for future use." *Id.* at § 1131(a).
111. The Wild and Scenic Rivers Act, 16 U.S.C. § 1271 (2003), states a policy that "certain selected rivers . . . shall be preserved . . . for the benefit and enjoyment of present and future generations."
112. The Clean Air Act, 42 U.S.C. § 7401 (2003): "The purposes . . . are . . . to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare . . . ." *Id.* at § 7401(b).
113. The purpose of the Clean Water Act, 33 U.S.C. § 1251 (2003), is "to restore and maintain the . . . integrity of the Nation's waters," by setting policies and goals. *Id.* at § 1251(a).
114. The Endangered Species Act, 16 U.S.C. § 1531 (2003), declares that the United States pledges itself "to conserve . . . various species . . . facing extinction," and that its policy is to "conserve endangered species." *Id.* at § 1531(a)(4).
115. *See* Chief Justice Schroeder's dissent in *Williams v. Wichita*, 190 Kan. 317, 341 (1962):

> If such *arbitrary* exercise of the *police power* of the state withstands the federal constitutional test of due process, the formula has been found, and the precedent is established, by which all private property within Kansas may be *communized* without cost to the state (emphasis in original).

Dissenting again in F. Arthur Stone & Sons v. Gibson, 230 Kan. 224, 238-39 (1981), Schroeder complained:

> Now, after the state has confiscated the vested property right of the landowner to the groundwater beneath the surface of his land and provided in the Act that 'all water in the State of Kansas is hereby dedicated to the use of the people of the State,' it is paradoxical to give the Director of the Kansas Water Office [sic] sole authority *to redistribute these vested property rights* to *individuals* of his choosing who make application of a permit to appropriate water (emphasis in original).

116. *See, e.g.*, Jim McLean, *Hispanic influx visible through economy, culture*, TOPEKA CAPITAL-JOURNAL, June 2, 2001, *available at* http://cjonline.com/stories/o60301/Kan_neweconomy.shtml.

See also, Tests show dramatic water level drops in drought areas, THE LEGAL RECORD (Johnson County, Kansas), January 28, 2003:

> 'Zero depletion is a fairly simple thing to do from a technical standpoint—you just don't pump the water,' Bossert [manager, Northwest Groundwater Management District No. 4] said. 'If you want to cripple the economy to save the water, it can be done in a heartbeat.' Zero depletion makes a 'nice sound bite,' but if that is the goal, the state of Kansas should have realized that in 1945 and never allowed the economic development that has occurred,' Bossert said.

117. Peck & Nagel, *supra* note 88, at 275-76:

Several . . . writers have struggled with the more general philosophic topic of justice between generations. While some admit that even defining the term 'generation' is difficult, they find a duty to conserve for the future, based on notions of morality, justice, or trusteeship. But that view is not universally shared, some arguing that there is no obligation to future generations.

118. One such polar view is Aldo Leopold's Land Ethic: An individual's ethics "prompt him . . . to co-operate * * * A land ethic cannot . . . prevent the alteration, management, and use of resources, but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state." ALDO LEOPOLD, A SAND COUNTY ALMANAC 230-40 (1966). A similar view is found in Dean N. William Hines, *A Decade of Nondegradation Policy in Congress and the Courts: The Erratic Pursuit of Clean Air and Clean Water,* 62 IOWA L. REV. 643, 649 (1977): "The simple idea on which the policy [of non-degradation] is based on the recognition that somewhere in the frenzied pursuit of more material possessions and a higher living standard it is morally necessary to think about what kind of world will be passed along to future generations." Not surprisingly, similar views were expressed at the Third World Water Forum in Kyoto. In presenting his paper on groundwater property rights, Dr. Singh (*see* note 1, *supra*), began: "No water, no life." On March 18, 2003, members of the Youth World Water Forum, part of the 3rd World Water Forum, debated a "young people's declaration," seeking to be included in decision and policy-making processes. The Declaration stated the following on the subject of sustainable development:

> The water sector requires a clear, holistic, and integrated long-term approach to the provision and use of water services. * * * [W]e can draw on historical experiences . . . and learn from these traditional methods . . . [which can] also teach us how to adapt our lifestyle, more appropriately to secure resources for future generations. * * * We believe that ethics, honesty, and morals are crucial to ensure long-term sustainable development.

At the other end of the spectrum is an argument by Derek Parfit, who posits first that "[i]f any particular person had not been conceived when he was in fact conceived, it is *in fact* true that he would never have existed." DEREK PARFIT, REASONS AND PERSONS 351 (1984) (emphasis in original). Parfit's argument, when applied to the groundwater depletion question, might run something like this: If Kansas decided to allow continued mining of its groundwater rather than conservation, the result will not necessarily make life worse off for anyone in the future. "Given the effects of two such policies on the details of our lives, it would increasingly over time be true that on the different policies, people married different people . . . [and thus] . . . some of the people who are later born would owe their existence to our choice of one of the two policies." *Id.* at 361. "Since these future people's lives will be worth living, and they would never have existed if we had chosen Conservation, our choice of Depletion is not only not worse for these people: it *benefits* them." *Id.* at 363 (emphasis in original). But he notes moral counter-arguments. First, "[i]f in either of two outcomes the same number of people would ever live, it would be bad if those

who live are worse off, or have a lower quality of life, than those who would have lived." *Id.* at 378. Second,

> What is our moral reason not to choose Depletion? On the Wide Principles, this choice benefits those who later live, since their lives are worth living, and they owe their existence to our choice. But if we had chosen Conservation other people would have later lived, and these people would have had a higher quality of life. On the Wide Principles, if people are caused to exist, and have a higher quality of life, these people are benefited more. The objection to Depletion is that, though it benefits those who later live, it benefits these people less than Conservation would have benefited those who would have later lived.

Id. at 397.

119. JOHN RAWLS, A THEORY OF JUSTICE 136 (1971).
120. Rawls assumes a fairy tale in which the legislative body is made up of people who have individual identities, interests, etc., but they all suffer amnesia and do not know who they are. They have to make decisions about public policy behind a "veil of ignorance," because they do not know what their own self interest is. They make the decisions in the best interest of all concerned because they do not know how they will be affected individually. Rawls' method, while theoretical, "is a dramatic way of asking people to imagine themselves making choices in their own self-interest but without knowing things which distinguish the interests of one from those of another, . . . a way of "enforcing a certain conception of equality on political decisions." BRYAN MAGEE, *Philosophy and Politics: Dialogue with Ronald Dworkin*, in MEN OF IDEAS 214 (1982).
121. "Therefore all things whatsoever ye would that men should do to you, do ye even so to them." Matthew 7:12.
122. "Live as if you were living already for the second time and as if you had acted the first time as wrongly as you are about to act now!" VIKTOR E. FRANKL, MAN'S SEARCH FOR MEANING 131, 132 (Pocket Books 1959) (1946), at 131, 132.
123. David Nelson, The Human Agenda, *The Gifts of Pluralism: Pitfalls and Prizes, Principles for Appreciative Inquiry Dialogue,*, ("[a]lways assume positive intent, [m]ake the other person right and tell the truth, [b]e unconditionally constructive no matter what you are feeling, [l]isten to understand and appreciate (not debate and discuss), [g]ive the other person language to match their intent, and [u]se 'talking stick' format (one person talks, all others listen). *See* http://www.humanagenda.com.
124. "Final offer salary arbitration" is used in workers' compensation and in major league baseball salary arbitration. In baseball, the ball player and the owner each propose a salary figure to the arbitrator, along with justification for each figure. The arbitrator must choose one figure or the other and cannot split the difference. *Final Offer Arbitration, available at* http://www.dir.ca.gov/chswc/BasebalArbFfinal.htm
125. That is, let one child divide the piece into two slices and the other child choose which slice to take.
126. Singh, *supra* note 1.
127. *See, e.g.*, ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION, at 58-102 (1990).
128. *See* AXELROD, *supra* note 2. Axelrod posits this question: "Under what conditions will cooperation emerge in a world of egoists without central authority . . . . In [a] situation where each individual has an incentive to be selfish, how can cooperation ever develop?" Axelrod's solutions for various problems appear to require direct interaction between participants, making them less relevant when the participants are separated by generations of time.

129. Interim Order in the Matter of Designation of an Intensive Groundwater Use Control Area in Trego, Ellis, Rush and Russell Counties, Kansas, Kansas Division of Water Resources (May 31, 1984). Mining was occurring in a portion of the Smoky Hill River Valley. To achieve safe yield, the water users agreed to restrict their annual pumping—irrigators, to 15 acre inches/acre, and other users to 95 percent of what had been used in 1981, 1982, or 1983, for the year 1984, and for subsequent years to 90 percent, until the Chief Engineer enters a new order. *See* Interim Order §§ 8-9.
130. KATAR SINGH, MANAGING COMMON POOL RESOURCES 125-311 (1994).
131. *See* OSTROM, *supra* note 127.
132. Some argue that the reasonableness requirement of the Act, including that found in Section 707(e), could be construed as a continuing one, not one reflective only of the meaning of reasonableness at the time of the issuance of the original permit. Phone conversation with Leland Rolfs, Kansas Division of Water Resources, March 5, 2003.

    Case law from California, *supra* notes 75-76, as well as requirements under the Kansas Water Appropriation Act that water use be reasonable, support the argument that reductions can be made to prevent waste and efficiency. *See* text accompanying note 90.
133. Cutting back water rights on a strict priority basis is exactly what each Kansas water appropriator expected when obtaining a permit. See KAN. STAT. ANN. §§ 82a-706, 706b, 707, 711, & 717a (1997). This expectation is a condition of each water right, either expressly or by implication. *See id.* at § 711 & 711a (1997).
134. *See* text at note 86, *supra,* where it is suggested that, based on discounting, the further off in the future the state can make the taking effective, the less it looks like a taking, and the less economic damage is done to the holder of the water right.
135. *See* Frank J. Trelease, *The Model Water Code, the Wise Administrator, and the Goddam Bureaucrat*, 14 NAT'L RESOURCES J. 207 (1974); Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244 (1968).
136. A similar proposal found in FRANK MALONEY ET. AL., A MODEL WATER CODE (1972) was criticized by Trelease, *id.*
137. *Cf.* MALONEY, *id.*, at 25, 189-90, which proposes a twenty year permit for all uses except municipal uses, which could receive a fifty-year permit. Trelease, *id.*, at 217-20, criticizes the term permit idea because *inter alia* it removes flexibility and the ability to amortize the investment in twenty years.
138. *See, e.g.*, Ky. Rev. Stat. Ann. § 151.200(1) (2002):

    > Notwithstanding the existence of any permits for the withdrawal . . . of public water, in times of drought, emergency, or other similar situations requiring a balancing of the rights and available water between water users, the cabinet, upon declaration of a water emergency by the Governor, may temporarily allocate the available public water supply among water users and restrict the water withdrawal rights of permit holders, until such time as the condition is relieved and the best interest of the public are served.

    But cf. Trelease, *supra* note 135, at 217, where, in discussing similar provisions in the Model Water Code, concludes: "I think the poor Bureaucrat, juggling equality, equity, economic efficiency, public health and safety, protection of investment, and protection of workers' jobs and farmers' livelihoods, might at this point take to the bottle, either milk for his ulcer or Whiskey to forget his troubles."
139. *See* KAN. STAT. ANN. § 82a-726 (1997).