Proceedings of the Sixth National Ground-Water Quality Symposium

State, County, Regional and Municipal Jurisdiction of Ground-Water Protection

September 22-24, 1982
Atlanta, Georgia

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Symposium Coordinating Committee

Jack W. Keeley, U.S. Environmental Protection Agency
Robert S. Kerr Environmental Research Laboratory
Ada, Oklahoma 74720

David M. Nielsen,
Jay H. Lehr and
Kathy Butcher,
National Water Well Association
500 W. Wilson Bridge Road
Worthington, Ohio 43085

Project Officer

Jack W. Keeley
Robert S. Kerr Environmental Research Laboratory
Ada, Oklahoma

Edited by

David M. Nielsen, Director of Research
and Linda Aller, Research Associate
National Water Well Association
Worthington, Ohio

Published by

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Abstract

The Sixth National Ground-Water Quality Symposium was held in Atlanta, Georgia, on September 22, 23 and 24, 1982. Under the current administration's policy of "federalism," the burden of administering and enforcing environmental regulations has shifted to state, county and municipal government agencies. As this shift takes place, programs will have to be formulated to deal with the issue of ground-water protection. The objectives of the symposium were to better define the role of each of the non-federal government agencies charged with the protection of ground-water resources and to assist those agencies in developing meaningful ground-water management strategies and programs. These proceedings are a compilation of papers presented by the Symposium speakers. Papers presented at the Symposium but not submitted by the authors for publication in this volume include those by:

Marwan Sadat, New Jersey Department of Environmental Protection
John Trela, New Jersey Department of Environmental Protection
Andrew Hogarth, Michigan Department of Natural Resources
David Miller, Geraghty and Miller Inc.
Kevin Kessler, Wisconsin Department of Natural Resources

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Disclaimer

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Section I
Introduction to Ground-Water Issues

An Overview of Laws Dealing with Ground Water

by Edward I. Selig

But for the modern science of ground-water geology, there might not be any law in this field worthy of the name. Certainly the law would not have emerged from the Dark Ages when subterranean waters were viewed by the courts as a mysterious phenomenon, moved "by influences beyond our comprehension." As one judge opined back in 1855: "The secret, changeable and uncontrollable character of underground water and its operation, is so diverse and uncertain that we cannot well subject it to the regulation of law, nor build upon it a system of rules, as is done in the case of surface streams."

A case decided by the Rhode Island Supreme Court in 1934, Rose v. Socony Vacuum Corporation, typifies the misinformation, misunderstanding and mysticism that still determined the resolution of ground-water disputes well into this century. The plaintiff owned a farm and a well from which he drew water for his family, pigs and hens. The defendant owned a large oil refinery and several storage tanks directly across the street from the plaintiff's farm. Petroleum products leaked from defendant's property and allegedly percolated through soil and ground water into plaintiff's well. But when plaintiff sued for nuisance, he was thrown out of court, not only because the judge considered oil spills as unavoidable in the refinery business, but because defendant was not expected to foresee the path of a spill migrating through the subsurface environment. The court reasoned that, since "courses of subterranean waters are... indefinite and obscure," rights to them are less easily definable than riparian rights to surface streams. Consequently, it would be "unjust to subject landowners to liability for the unforeseeable consequences of legitimate land uses."

That case was, however, expressly overruled by the same court in April 1982 in Wood v. Picillo, (No. 80-419, April 9, 1982). Expert testimony in this case established that pollutants were migrating from a hazardous waste dump operated by the defendant and were jeopardizing adjacent ground-water supplies. In finding for the plaintiffs, the court observed that, in the years since Socony-Vacuum was decided:

"The science of ground-water hydrology, as well as societal concern for environmental protection has developed dramatically. As a matter of scientific fact the courses of subterranean waters are no longer obscure and mysterious. The testimony of the scientific experts in this case clearly illustrates the accuracy with which scientists can determine the paths of ground-water flow."

A comparable awakening can also be observed in recent opinions of the federal courts. In the summer of 1982, for example, the Supreme Court of the United States handed down an opinion containing the following observation:

"The multistate character of the Ogallala aquifer—underlying appellants' tracts of land in Colorado and Nebraska, as well as parts of Texas, New Mexico, Oklahoma and Kansas—confirms the view that there is a significant federal interest in conservation as well as in fair allocation of this diminishing resource."

A footnote to the court's opinion cites at this point a 1980 study of the Comptroller General, entitled "Ground-Water Overdrafting Must Be Controlled." When science advances, the law is sure to follow, and the impact of ground-water geology on the law is no exception to that rule.

But can the passage quoted above from a Supreme Court opinion be construed as a prophecy that the federal government will become increasingly involved in regulating and managing ground-water resources, now that their multistate character and national significance have become quite clear? The short answer to this question is, probably not. Ground water is perhaps the only major resource of national significance that is going to be regulated, managed and allocated primarily

by state law, not federal law. That is the principal thesis of this paper. The health and welfare of the public may indeed require ground-water protection nationwide and ground-water management on an interstate scale, but the states themselves, acting singly or through compacts, remain the most appropriate level of government for incorporating new scientific knowledge into the development and application of ground-water policy. One reaches this conclusion for a number of reasons: the diversity of hydrogeological environments and contaminating sources; the intimate connections between local land use and use of ground water for various purposes; the traditional dominance of the states in regulating both land and ground-water use, and in developing the common law on these subjects; and the transfer of administrative authority over national ground-water programs from the federal government to the states. In short, management of ground-water quality and quantity belongs, by and large, to the states under their own distinct systems of state and local law.

The Limited Reach of Federal Law

To be sure, there is a significant body of federal law on the subject of ground-water quality control. But if surface waters were any model for how Congress might also deal with ground water, what would be the result? There would be a Federal Clean Ground-Water Act, prescribing criteria and standards for ground-water quality throughout the United States; establishing a national permit system to control discharges of contaminants to ground water; specifying application of best available technology or best management practices at all potentially polluting facilities; and funding a construction grant program for pollution control at facilities owned or supervised by public entities. In other words, there would be a systematic approach to protecting the resource nationwide.

That is not, however, the route that Congress has taken. What we have instead is a hodge-podge of federal laws, all addressed to particular types of contaminating sources:

1) Under Subtitle C of the Resource Conservation and Recovery Act (RCRA), the Environmental Protection Agency has promulgated standards to prevent ground-water pollution from storage and disposal of hazardous wastes. These standards regulate design, operation and performance of hazardous waste facilities, and specify detailed protocols for monitoring their impacts on ground water. Criteria for distinguishing between sanitary landfills and open dumps in terms of ground-water impact are also set forth in regulations under Subpart D of RCRA.

2) The Underground Injection Control Program, established under the Safe Drinking Water Act, regulates the subsurface emplacement of fluid wastes, in order to prevent them from endangering underground sources of drinking water. Engineering, performance and monitoring requirements have been established for five classes of disposal wells under this program.

3) Under §1424(e) of the same act, if EPA determines that "an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health . . . no commitment for federal financial assistance . . . may be entered into for any project which the administrator determines may contaminate such aquifer through a recharge zone," unless adequate pollution controls are built into the project design. A number of so-called "sole source aquifers" have been designated under this provision.

4) Construction grant regulations under Title II of the Clean Water Act (CWA) require that land application be evaluated as an alternative technology for treating and managing wastewater. Such an alternative may qualify as best practicable waste treatment technology in terms of a) cost-effectiveness, and b) meeting applicable criteria for use of receiving ground water. There are three classes of criteria for land application (Cases 1-3), according to whether the resulting and receiving ground water can be used, is being used or will not be used for drinking water supply.

5) Various other activities and practices that may affect ground-water quality are regulated under miscellaneous federal laws: e.g., uranium mill tailings under the Atomic Energy Act and the Uranium Mill Tailings Radiation Control Act; disposal of PCBs under the Toxic Substances Control Act; application of pesticides under the Federal Pesticide Act; and mine drainage under the Surface Mining Control and Reclamation Act.

6) The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), popularly known as the Superfund Act, establishes a fund and provides an elaborate legal framework for controlling ground-water pollution through cleanup or containment sites. Far-reaching enforcement powers are established under this act to make legally responsible parties pay for portions of cleanup costs.

The foregoing laws address some major sources of ground-water pollution, but fall far short of providing a legal framework for ground-water quality management. They require specific types of facilities to be brought under control, but have little to say about ground water itself. In fact, the only federal law that expressly recognizes the occurrence of ground water in aquifers is the provision in the SDWA for sole-source aquifer designations, and even here the focus is on regulation of potentially contaminating land uses. In short, federal law in this field is piecemeal, fragmentary and atomistic, and it does not begin to control either the quantitative allocation of the resource or the quality/quantity relationships that ground-water managers must address.

Moreover, nearly all federal programs for controlling ground-water pollution are destined to be taken over by the state governments. States have begun to assume primary enforcement responsibility for the UIC Program, and to administer their own hazardous waste regulations in lieu of the federal program pursuant to Phase I authorization under RCRA. The designation of "exempt" aquifers, not constituting drinking water supplies and therefore not subject to the

UIC regime, is a state responsibility. So is the designation of "alternative boundaries" within which a sanitary landfill may pollute ground water without affecting such supplies. Even where states do not have the primary administrative or enforcement responsibility, they hold the key cards. Construction grant regulations under the Clean Water Act provide for federal-state collaboration in designating Case 3 aquifers, but as a practical matter, the final decision on whether any part of an aquifer will not be used as drinking water must be made by the states, since they have the power of resource allocation. The states are also responsible for prioritizing the contaminated sites to which Superfund money will be allocated in accordance with the National Contingency Plan.

Federal law supplies minimum standards and impetus for state programs. States will carry the ball. In fact, a recently issued policy directive from the EPA administrator calls for development of an agency-wide policy that will recognize the primary role of the states in ground-water management.

Primacy and Capabilities of State Law

There are at least five species of state (and local) laws that protect ground water, regulate its withdrawal and resolve conflicts between competing demands for it:

1) Controls over design and performance of discharging sources are prescribed in numerous state regulations and permit programs. These cover not only activities that are also regulated by federal law—such as solid and hazardous waste disposal and underground injection—but a wide range of potentially polluting sources beyond the effective reach of federal law: septic systems, fuel and chemical storage tanks, salt piles, storm water detention basins and so on. By and large, such regulations call for engineering and operating practices that will keep potentially polluting activities from interfering with ground-water quality goals. The regulatory style may emphasize specification standards, source-performance standards, environmental performance standards or some combination of these. Thus, for example, steel or fiberglass may be prescribed for underground fuel storage tanks; septic tank cleaners containing organic chemicals may be banned; effluent limitations and controlled degradation zones may be established for landfills.

2) Broader land use controls may be written into law, especially to prevent contamination through the recharge zones of sensitive, high-quality aquifers. Zoning is the primary regulatory vehicle here, since it can protect ground-water quality in three ways: by prohibiting or restricting the location of polluting sources within the zone, by allowing development only in densities not exceeding the assimilative capacity of the soil and by limiting conversion of natural to impermeable surfaces so as to preserve natural recharge and to keep saline or polluted water from intruding into the aquifer. These functions can be served by mapping aquifer protection zones and incorporating them as overlays upon pre-existing districts. The zoning enabling laws of many states now authorize exercise of the zoning power for protection of ground-water supplies and the courts have repeatedly upheld ordinances enacted for that purpose.

Within an aquifer protection zone, passive and non-intensive uses are typically allowed, such as conservation, recreation, forestry and farming. Other uses may be prohibited, such as disposal of industrial and solid wastes, storage of chemicals and industrial uses that discharge wastewater on site. Some uses may be allowed by special permit after site plan review to assure that the activity is so designed and constructed as to avoid contaminating ground water. Residential development is usually allowed, but only in low enough densities and on other conditions designed to maintain quality and quantity of recharge. Zoning, purchase of open space for preservation, and other varieties of water-related land use controls are sometimes exercised at the state level but more frequently at the local level of government.

3) **Aquifer classifications and ground-water quality standards may be adopted by a state as the centerpiece of a program for managing ground-water use.** Classification of aquifers makes sense as regulatory policy when it is recognized that not all ground water can or should be protected to the same degree for present and future uses. In order to accommodate needs for water supply, agriculture, urban industrial development and waste disposal facilities, different levels of protection may be appropriate. Classifications may also reflect existing differences among aquifers in terms of water quality, yield, vulnerability to pollution, and other variables affecting suitability for drinking water supply.

Designations of discrete, physically identifiable aquifer zones or segments, either through maps or narrative criteria, can be adopted by rule-making process, will thereupon have the force of law in guiding both the location of potentially polluting facilities and the diversion of ground water for beneficial uses. In other words, classification may be followed by further regulatory controls—such as aquifer district zoning, facility siting standards, prescription of best management or engineering practices, and restrictions on ground-water withdrawals—all geared to assuring realization of the needs and goals embodied in the classification system. In particular, aquifer classification can direct the siting of waste disposal and chemical storage facilities away from areas of greater and into areas of lesser environmental sensitivity. If the classifications are expressed in terms of numerical water-quality standards, then these can serve as guides either for implementing a non-degradation policy with respect to water of variable background quality, or for establishing discharge limitations to keep particular sources from degrading ground water below the established standards.

4) **The common law of nuisance, negligence and strict liability,** as developed by the courts of the 50 states, is available for the redress of property damage or personal injury suffered by any person as a result of ground-water contamination for which another person

can be held responsible. There are many reported cases in which a plaintiff recovers damages from a discharger whose wastes have migrated through the flow system into plaintiff's water well. In such a case, plaintiff must prove causality, injury and conduct that was wrongful on the part of the defendant because it was intentional, negligent or abnormally dangerous in posing risk of injury to the plaintiff. The majority of these cases are brought under the law of nuisance, which is a substantial and unreasonable interference with the use and enjoyment of property, including ground water.

The prospect of being sued at common law for contamination of wellfields and for injuries to the health of water users has deterred many industries from engaging or persisting in careless waste disposal and chemical management, quite apart from any regulatory law that may be enforced against them by government agencies.

5) **Allocation of ground-water resources through recognition of water rights** is governed by a distinct body of state law. Rights in percolating water may be determined by any of four theories: absolute ownership, reasonable use, correlative rights and appropriation. Under all except the last of these, rights to ground water are appurtenant to ownership of the overlying land. Depending on which theory prevails in a particular state, the landowner may freely pump as much as he pleases for any use, or for any reasonable use on the overlying land, even though he thereby deprives others of water; or he may use the water for a reasonable and beneficial purpose, subject to the exercise of similar rights by other owners and to equitably apportioned cutbacks in time of shortage. This last rule of correlative rights is similar to the reasonable use doctrine that governs the exercise of riparian rights on surface streams of many Eastern states.

In their purest form, the three common-law theories described above involve no element of administrative regulation. "One who owns land overlying a ground-water basin simply drills a well, and if at some later time others with claims to the same water source complain, a court will sit to determine whether a right (in one of the three forms described above, or some mixture thereof) has been violated." Instead of leaving such disputes to the forum of private litigation, many states have superimposed regimes of administrative regulation upon the basic common-law rules. Such regulations, frequently implemented through permit systems, may control spacing and drilling of wells, rates of water withdrawal, uses to which the water may de dedicated and allocation of cutbacks among competing pumpers in times of shortage.

The fourth of the theories identified above, the appropriative system of water rights, has been applied to ground water by statutes of certain Western states. As with surface water governed by this doctrine, priority of appropriation gives a prior right, which means that the fixed, quantitative right of a senior appropriator will be protected from interference by anyone junior to him. "An appropriator has a right to use a given quantity of water each year when the supply is available, according to his priority. If the supply is not sufficient, the use must be curtailed or cut off in reverse order of priority." Nor may new ground-water diversions be allowed in a basin that is deemed to have been fully appropriated. Strong elements of this doctrine can also be found in the permit systems of certain Eastern states, to the extent that these give priority to older pumpers by denying permits for new wells that would interfere with existing ones.

An appropriated water right, fixed in quantity, transferable and not restricted to use on the overlying land, comes about as close to being an absolute right to water as the law can afford. It is not quite absolute, however. Priority of appropriation does not entitle the owner to an inefficient means of diversion, such as a well so shallow that it does not produce sufficient water to satisfy both senior and junior rights when this could be done by drilling a deeper well. Improved methods of diverting water, "so as to assure the greatest possible use of the natural resource," may be required of senior appropriators, and they are not entitled to "command the whole source of supply merely to facilitate the taking by them of the fraction of the entire flow to which their senior appropriation entitles them." These limitations, as well as those affecting other species of water rights, are important not only for achieving efficient allocation of the resource, but also for assuring its qualitative protection.

The five species of law, described above, are capable of covering the entire field of ground-water management. They are administered by a bewildering variety of state and local agencies: departments of environmental protection, water resources commissions, water management districts, the courts, zoning boards, health departments and so on. A further range of agencies that promote or regulate land use must also be included in the picture, since land and water uses are closely connected. The obvious challenge then arises: how will all these pieces of the puzzle be fitted together for maximum social benefit in the use of ground water and related land resources?

Ultimately, that is a political question beyond the scope of this paper. But it is also a challenge to legal systems, under which institutions are created and decisions are made that may either promote or retard coordination of efforts toward whatever set of objectives the political process may specify. The laws themselves and institutions that administer them must be re-examined and coordinated to a higher degree than has so far been achieved, if ground-water management is not to be undermined by flaws in the legal framework. The remainder of this paper attempts a beginning at that task.

Coordinate Exercise of Legal Powers for Optimal Ground-Water Management

Development of land and water resources repeatedly gives rise to the following types of situations:

- Suburban development upgradient of protected areas around a municipal wellfield results in reduced

recharge of a shared aquifer, and in increased concentration of dissolved solids in the ground-water supply. The municipality has not only lost the long-term yield of a critical water supply which will be costly to replace, but must also build a costly treatment facility for the water it currently withdraws.

- A barrier well is used to keep contaminants in the ground from migrating to a new production well. However, operation of the two wells together has greatly reduced the total supply, which must now be rationed among its users.
- Pollution of an aquifer from numerous failing septic tanks is controlled by sewering, centralized treatment and discharge of treated effluents out of the basin. Consequently, ground-water supply is sharply curtailed.
- A proposed wastewater treatment facility for a town would include land disposal of treated effluents into a "Case 3" zone, so designated to receive a potentially contaminated plume extending downgradient from the disposal site. The town would have to provide municipal water to all land owners within this zone and/or to purchase easements from them for the proposed waste-receiving use of ground water to which they would otherwise be entitled. However, unless the town can also control pumpage beyond the Case 3 zone, it will not be able to manage the plume, which could be intercepted by a large well located just outside that zone.
- Withdrawal of water from a large well, in the exercise of a senior appropriative right, induces migration of a contaminant plume into nearby wells of junior appropriators.
- A locality would like to incorporate an aquifer protection district into its zoning ordinance, but hesitates to do so in the absence of a detailed hydrogeological study that would justify the boundaries of the zone and the proposed restrictions on land uses within it. Moreover, landowners within the proposed zone say they will demand to be compensated for loss of property values caused by such restrictions.
- A state classifies an aquifer segment as suitable for waste assimilation, affords a limited zone of degradation for a waste disposal facility to be located over that segment, and restricts pumping from water wells downgradient of this facility. Owners of these wells complain that their water rights have been infringed, and that they are entitled to compensation from the state or from the facility owner.

Two major lessons can be learned from the foregoing examples. First, if agencies in charge of land development, water-quality control and water allocation do not communicate and coordinate with one another, they will fail to reconcile competing interests and to reach decisions that maximize social benefits from the uses of water and land. But secondly, unless the law is quite clear concerning whether and when property rights in land and water can be restricted for purposes of sound resource management, wise decisions may not be made because of legal inhibitions.

In fact, what all these examples have in common is some degree of legal uncertainty concerning how to allocate rights, duties and liabilities under circumstances of actual or potential water shortage, whether this is caused by overdrafting, pollution or pollution controls. For whatever cause, when the supply of usable ground water becomes insufficient to serve all the demands that are made upon it, adjustments must be made among competing interests: land development will have to be limited by availability of water supply; new facilities must be so located, designed and operated as not to risk degradation of critical aquifers and withdrawals must be restricted for ground-water protection in both a quantitative and qualitative sense. But does the law promote or retard such adjustments? This question has both constitutional and institutional aspects which are considered below.

Constitutional Issues

The protections afforded to private property by constitutional law may inhibit governments from restricting the rights of people to develop their land or to withdraw water for beneficial uses. It is provided in the Constitution that no person shall be deprived of property without due process of law, and that private property shall not be taken for public use without compensation. The right to take and use ground water is a species of property rights, as is ownership of land. However, these constitutional inhibitions have been needlessly exaggerated in the field of land and water management.

This paper began by acknowledging the legal system's indebtedness to the science of ground-water geology. But how much scientific validation is needed in order to sustain restrictive zoning for aquifer protection? The answer is, not as much as some planners and regulators have been led to believe. To be sure, restrictive regulations must not "arbitrarily invade private property or personal rights . . . There must be a clear, real and substantial connection between the assumed purpose of the enactment and its actual provisions . . . Thus, for example, a zoning specification of 4-acre-minimum lot sizes in an unsewered area was struck down by the Pennsylvania Supreme Court, where there was no credible factual basis for concluding that development on smaller lot sizes would result in ground-water pollution. On the other hand, if the means/end relationship between land use controls and protection of ground-water supply is supported by some credible evidence, the ordinance will be sustained as a valid exercise of the police power:

"Courts presume, unless shown otherwise, that an ordinance is valid, and if it is reasonably related to public welfare, health and safety in a manner characterized by the appellate courts as fairly debatable, it will be upheld. Further, the burden of showing that the zoning ordinance is invalid is on the challenger . . . The courts should not become super zoning review boards. Zoning decisions are primarily legislative in nature and such decisions should be made by zoning authorities respon-

sible to their constituents."

Whether a plaintiff wishes to challenge the validity of an aquifer protection zone in general, or to claim that its boundaries were incorrectly drawn to include his property, he will have to bear the burden of proving that the restrictions are arbitrary or lacking in rational justification. It is not required of the zoning agency to prove, beyond scientific doubt, that the ordinance is necessary and that its boundaries accurately delineate the recharge zone to be protected. Some scientific evidence on these points, however inconclusive it may be, will ordinarily suffice, even in the face of evidence to the contrary introduced by the plaintiff. Moreover, since zoning laws commonly served specific purposes—such as preservation of open space in addition to protection of drinking water supplies—it will be virtually impossible, in most cases, for a plaintiff to satisfy the requisite burden of proof for overturning the ordinance.

Nor are plaintiff property owners likely to succeed on claims that upzoning from smaller to larger lots is invalid as an unconstitutional taking of private property for public use without compensation. In case after case, courts have observed that "zoning is not a guarantee of marketability, nor must it guarantee every investor a profit," and that "it is not necessary to the constitutional validity of an ordinance that it permit the highest and best use of a particular piece of property." To be sure, if a zoning ordinance deprives a property owner of all economically reasonable use of his land, a court may find a taking. But carefully framed ordinances that permit some non-intensive uses will seldom be struck down on that basis.

It is worth clarifying at this point the difference between police power regulations and compensatory takings:

"The essential distinction between an exercise of a state's eminent domain power which is compensable and the exercise of the police power which is not is that in the exercise of eminent domain a property interest is taken from the owner and applied to a public use because such use is beneficial to the public, while in the exercise of the police power an owner's property interest is restricted or infringed upon to prevent its use in a manner detrimental to the public interest."

The practical consideration behind this distinction is that "government could hardly go on if to some extent values incident to property could not be diminished without paying for every . . . change in the general law" resulting in such a diminution. Therefore, "governmental decisions may deprive an owner of a beneficial property use—even the most beneficial such use—without rendering the regulation an unconstitutional taking." Only when regulations go so far as to strip private property of all practical value will they be susceptible to being overturned as forbidden takings without compensation.

We are now ready to deal with a case of first impression, on which no reported judicial opinion has yet been found: by senior appropriation, Well-owner O has the right to pump one million gallons per day of ground water from an aquifer. O needs this water in order to fulfill contracts with customers who are municipal water suppliers. But the effect of O's pumping is to induce movement of a contaminant plume into smaller wells in the same vicinity. For purposes of plume management, the concerned regulatory agencies want O to cut back his pumping rate to half a million gallons per day. Can this be done without compensating O?

The proposed restriction would not be designed to reappropriate private water for a public use, but to protect the interests of all users in the basin from impending harm. And as we have already seen, not all regulations that protect public health and welfare by restricting the exercise of property rights are public takings. Moreover, no property interest is so absolute that it cannot be curtailed by a valid exercise of the police power. "Where the public interest is . . . significantly involved, the preferment of that interest over the property interest of the individual even to the extent of its destruction is a distinguishing characteristic of the exercise of the police power." Faced with the situation described above, a court should have little difficulty in holding that the appropriated right can be cut back, without compensation, in order to keep the contamination under control.

That last quote was taken from a case in which a court upheld the denial of a permit to a landowner who had asserted his right, under the rule of absolute ownership or reasonable use, to drill a new well in a "critical ground water area" so designated under Arizona law. In fact, courts have repeatedly held that ground-water appropriation statutes may constitutionally be superimposed on previous rules of absolute ownership, despite the invasion of pre-existing rights occasioned by such a change. Why could a court not go a step further and hold that an appropriated right, in turn, is subject to further restrictions in the exercise of the police power?

In fact, as we have seen, water rights are not absolute even under the appropriative system of water law. In order to accommodate junior appropriators, the senior ones may have to tolerate reductions in historic water levels or artesian pressure, or to employ more efficient means of diversion, or even to suffer cutbacks in time of shortage. Most important of all for present purposes is the line of cases holding that a prior appropriator, in the exercise of his water right, is not entitled to pollute an entire stream to the detriment of subsequent appropriators. If a senior appropriator can be enjoined under this rule from commanding an entire stream by polluting it with direct discharges of wastewater, why may he not similarly be enjoined if the downstream pollution results from his withdrawing water in excess of safe yield? In the example given, his right is to withdraw one million gallons per day, not also to render *additional* water unfit for use by other permittees to water rights in the basin. The same principle should apply with even clearer force where pumping occurs pursuant to any of the more variable water rights under other theories of