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Supplemental Groundwater Irrigation Law: From Capture To Sharing

A. Dan Tarlock, *Chicago-Kent College of Law*

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BY A. DAN TARLOCK*

INTRODUCTION

The Middle West and South East are the nation's farmbelt because these areas are blessed with good soil and abundant water resources. In contrast to the Great Plains and the Far West, crops have historically been grown in these regions without irrigation. Farmbelt agriculture has not competed either with the major consumptive uses of water—domestic use, municipal supply and industrial use—or with the major non-consumptive uses of water—navigation and recreation. However, regional agricultural nondependence on irrigation is now changing. Crop irrigation, for example, is rapidly increasing in the East and South Atlantic Gulf regions.¹ In humid regions, supplemental irrigation allows farmers not only to preserve existing crops but also to improve crop yields, to plant two crops per growing season and to switch to more valuable crops. The summers of 1982, 1983 and 1984 were unusually dry, and supplemental irrigation was used extensively during these years, but the trend toward sup-

*A.B. 1962, LL.B. 1965, Stanford University, Professor of Law, Chicago Kent College of Law in the Illinois Institute of Technology. Raymond F. Rice Distinguished Visiting Professor of Law, University of Kansas, Fall, 1985. Professor Tarlock consulted in the preparation of plaintiff's trial and appellate briefs in *Prohosky v. Prudential Insurance Co.* discussed at notes 111-19.

¹ CONGRESSIONAL RESEARCH SERVICE OF THE LIBRARY OF CONGRESS STATE AND NATIONAL WATER USE TRENDS TO THE YEAR 2000, 96th Cong., 2d Sess. 244 (1984) (report prepared for the Senate Committee on Environment and Public Works).

plemental irrigation has been growing for the previous fifteen years.²

Supplemental irrigation in the Middle West and South East may be accelerated by trends in both regional and national agriculture. Agriculture is a business which must respond to technological advances in production techniques. Agriculture is becoming more capital intensive as machinery, fertilizers and chemicals are substituted for labor. Crop yields must increase to finance the new technologies, especially given the scale on which they are applied. An adequate water supply must be readily available to ensure that these higher crop yields can be achieved. Moreover, long term increases in the value of agricultural land further accelerate the adoption of irrigation systems.

Farmers in the Middle West and South East have additional incentives to invest in supplemental irrigation. Irrigated agriculture has historically been centered in the Far West, but increased pumping costs, caused by energy price increases and declining supplies from mined aquifers, portend a shift from field crops grown with groundwater to crops that can be grown on dryland or irrigated with surface supplies. In many parts of the Far West, surface supplies are unavailable or are fully allocated under the law of prior appropriation so that it will be very costly to acquire new agricultural water rights. Thus, some land may have to be retired from irrigation. The Middle West and South East will be the big regional winners from a shift in crop production patterns. One recent study predicts:

The Upper Mississippi, Lower Mississippi, and South Atlantic-Gulf basins will receive large increases in resource value. . . .
Income [will shift] from the groundwater reliant irrigated ba-

² In Indiana, for example, irrigated acreage increased by almost 65% from 1967 to 1976. See COOPERATIVE EXTENSION SERVICE, PURDUE UNIVERSITY, IRRIGATION OF FIELD CROPS IN INDIANA: A GUIDE FOR EVALUATING IRRIGATION POTENTIAL ON YOUR FARM 2 (1976).

In many states, such as Kentucky, the extent of groundwater withdrawals is not known. There are no specific Kentucky reports on the use of groundwater for supplemental irrigation. One study, however, states that approximately 0.2 million gallons per day (mgd) are pumped from Kentucky groundwater sources and 4.7 mgd from surface water sources for irrigation purposes. UNITED STATES GEOLOGICAL SURVEY, WATER SUPPLY PAPER 2250, NATIONAL WATER SUMMARY 1983 - HYDROLOGICAL EVENTS AND ISSUES 133. For a discussion of the situation in Arkansas see Looney, *Modification of Arkansas Water Law: Issues and Alternatives*, 38 ARK. L. REV. 221, 222 (1984).

sins to some surface reliant irrigated basins, but mostly to the dryland regions which become [better] able to compete for resources as water prices rise.³

Groundwater will be used more than surface water for supplemental irrigation because the technology is in place, because supplies are more widely available and dependable during spot droughts and because there are fewer legal constraints on groundwater as compared to surface withdrawals.

This Article examines the law of groundwater allocation in the Middle West and South East and proposes some modest reforms to resolve the inevitable conflicts that will arise between supplemental irrigators and other users. The existing law primarily follows the common law, which characterizes groundwater as an incident of land ownership rather than as a common pool resource to be shared among similarly situated users.⁴ The Restatement (Second) of Torts [hereinafter Restatement Second] and a few courts have made initial efforts to adopt true sharing rules,⁵ but the impact of these new decisions on conflicts between farmers and supplemental irrigators, or among supplemental irrigators, is not clear.⁶ A few states have supplemented the common law with regulatory institutions, but these new alloca-

³ Christensen, Morton & Heady, *Changing Energy Prices and Irrigation Patterns in U.S. Agriculture*, 2 SW. REV. 85, 96-99 (1982). A recent summary of a major study of the future of American agriculture notes:

Much of the recent growth in irrigated acreage has been concentrated in four states: Nebraska, Kansas, Oklahoma and Texas. Here irrigation is used mainly to grow sorghum, corn and alfalfa. These crops are commonly raised to feed cattle, and many of the nation's largest feedlots are in the same states. The beef production has been made possible by the "mining" of the Ogallala aquifer, a vast underground lake that spans eight states. . . . Recharge to the aquifer is exceedingly slow, with the result that the water table has been steadily falling and pumping has become more costly.

Eventually the combination of a falling water table and rising energy costs will probably make ground-water irrigation less popular. Farmers are adjusting to higher water costs by adopting water-conservation measures; still, the difference in profitability between irrigated farming and dryland farming has narrowed. If dryland farming returns to these areas, concentrated cattle feeding will no longer have a competitive advantage in the states overlying the Ogallala aquifer.

Batie & Healy, *The Future of American Agriculture*, 248 SCI. AM. 45, 47 (Feb. 1983). See generally M. BITTINGER & E. GREEN, *YOU NEVER MISS THE WATER TILL . . . (THE OGALLALA STORY)* (1980).

⁴ See notes 23-41 *infra* and accompanying text.

⁵ See notes 42-65 *infra* and accompanying text.

⁶ See notes 66-120 *infra* and accompanying text.

tion mechanisms are generally limited to emergency situations and rarely have been used to allocate scarce supplies.⁷ The thesis of this Article is that the increased use of supplemental irrigation will require the Middle Western and South Eastern states to modify the common law rules of groundwater rights to incorporate more equitable sharing rules.

Administrative allocation schemes are a secondary priority in the Middle West and South East. Substantial legislative intervention in groundwater allocation disputes is unlikely in the foreseeable future because there is no need for the humid states to implement conservation regulatory regimes on the scale of programs in Arizona, Colorado or New Mexico.⁸ The courts continue to be an adequate institution to resolve conflicts between supplemental irrigators and other users. The issue is what rights the respective parties have, and there is sufficient precedent to guide the courts. However, should farm consolidation trends accelerate conflicts among supplemental irrigators beyond the capacity of judicial resolution, local district regulation would be the most desirable alternative. Agriculture has a long and rich history of addressing problems through the use of local districts formed by self-interested parties.⁹

This Article first proposes a general policy framework for the recognition of groundwater property rights.¹⁰ Three possible approaches to groundwater allocation are then surveyed: (1) the common law, (2) the Restatement (Second) of Torts and exten-

⁷ See notes 121-44 *infra* and accompanying text.

⁸ See generally Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions For the Future*, 24 NAT. RESOURCES J. 641 (1984).

⁹ A prime example is the Soil Conservation Service, an organization which provides for co-operations between local farmers and the federal government in soil conservation matters. See SOIL CONSERVATION POLICIES, INSTITUTIONS, AND INCENTIVES 7-8 (H. Halcrow, E. Heady & M. Cotner ed. 1982).

¹⁰ The issues surrounding competing use of scarce common property resources are to be distinguished from those issues surrounding alleged intertemporal misallocations of nonrenewable natural resources, such as coal and oil. In the former situation, the concern is primarily upon the failure of users of the common property resource to account for the effect their use has on the ability of competing users to enjoy their use of the resource. While this situation will often result in "over-use" of the resource, see R. BOADWAY, PUBLIC SECTOR ECONOMICS 104-11 (1979), there may be no intertemporal misallocation of resources if the resource is renewable. This Article is concerned with the former issue.

sions thereof, and (3) legislative modifications of the common law.

I. PROPERTY RIGHTS ASSIGNMENT CRITERIA

The creation of a market for a resource generally results in the efficient allocation of that resource.¹¹ Groundwater has a number of potential uses and it is socially desirable to allow markets, rather than a centralized authority, to generate the allocation choices. In order for a market to operate efficiently and fairly, the assignment of property rights in the resource must meet three conditions: (1) maximum exclusivity, (2) enforceability and (3) transferability.¹² Otherwise, there will be insufficient incentives for individuals to try to maximize the value of the resource.¹³

With respect to groundwater, the first condition, maximum exclusivity, is the most difficult to achieve. It is difficult to assign exclusive rights to a resource when, for physical reasons, one claimant's consumption inevitably interferes with another's legitimate consumption. A groundwater basin is not like a coal reserve which can be divided among different landowners; groundwater must be shared at all times by a large number of users. One pumper's use affects both the quantity and pressure rate available to other pumpers. In short, the assignment of groundwater pumping rights poses a knotty problem of adjusting responsibilities for reciprocal externalities.¹⁴ Groundwater rights therefore have two

¹¹ See Anderson, Burt & Fractor, *Privatizing Groundwater Basins: A Model and Its Application*, in *WATER RIGHTS: SCARCE ALLOCATION, BUREAUCRACY AND THE ENVIRONMENT* 135-36 (T. Anderson ed. 1983).

¹² *Id.* at 223, 227.

¹³ *Id.*

¹⁴ An externality is said to exist if an activity of one party (a household or firm) affects the utility or production possibilities of another party without being priced. The fact that it is not priced implies that the "emitting" party has no incentive to take into consideration the effect, beneficial or detrimental, on the "affected" party. That being the case, the emitting party may devote an inefficient amount of resources to pursuing the activity.

R. BOADWAY, *PUBLIC SECTOR ECONOMICS* 91 (1979).

"Reciprocal externalities exist when each party both emits and receives an externality from the other party. The most celebrated sort of [reciprocal externality] is the so-called internal-to-the-industry externality arising in the unpriced use of common property resources. . . ." *Id.* See also *id.* at 104-11. See generally Friedman, *The Economics of the Common Pool: Property Rights in Exhaustible Resources*, 18 *UCLA L. REV.* 855 (1970-71).

components: a claim to a fixed quantity and a claim to a fixed pressure level. The quantity interrelationship issue can be solved by rules that fix a definite quantity for each pumper, as was done in California through the doctrine of mutual prescription,¹⁵ or as was done in Oklahoma by statute.¹⁶ The pressure level issue is harder to solve because each pumper's use causes reciprocal externalities. A truly efficient solution would charge each pumper for his share of the reciprocal externalities, but the information costs of implementing such a solution exceed the benefits of a completely rational solution.¹⁷

Legally, the most difficult allocation issue is deciding how to assign common property rights between prior and subsequent claimants.¹⁸ There is a strong, but not completely compelling, case for assigning groundwater rights to the first pumpers in a basin.¹⁹ Our whole system of property rights is based on protecting the expectations generated by prior possession.²⁰ Most claimants would consider it unjust if prior possession was not protected against subsequent possession. Also, it is often efficient to assign property rights to prior users rather than subsequent users. The subsequent user who values a resource more than the prior user, can purchase the right to use the resource. Finally, the subsequent user is often in a position to avoid the social costs of the initiation of a new use. However, this analysis does not apply to common property resources with the same

¹⁵ See *City of Pasadena v. City of Alhambra*, 207 P.2d 17, 32 (Cal. 1949), *cert. denied*, 339 U.S. 937 (1950). The California Supreme Court subsequently held that mutual prescription does not apply against or between municipalities. *City of Los Angeles v. City of San Fernando*, 537 P.2d 1250, 1301-02 (Cal. 1975) (construing CAL. CIVIL CODE § 1007 (West 1982)).

¹⁶ See OKLA. STAT. ANN. tit. 82, § 1020.9 (West Supp. 1984-85).

¹⁷ See Friedman, *supra* note 14, at 866-68.

¹⁸ This analysis owes much to Epstein, *Nuisance Law: Corrective Justice and its Utilitarian Constraints*, 8 J. LEGAL STUD. 49, 82-87 (1979). Professor Epstein argues for a corrective justice theory of nuisance law that compensates those who suffer invasions of previously assigned rights. The assignment of rights, however, must be based on the expectations of the parties to exclusive enjoyment of a claim. In situations where community activities make all members at once a tortfeasor and a victim, where the injuries are reciprocal, it is not fair to compensate those who suffer injury. Instead, a "live and let live" rule is fair. See also Epstein, *Possession as the Root of Title*, 13 GA. L. REV. 1221 (1978-79) [hereinafter cited as *Root of Title*].

¹⁹ See *Root of Title*, *supra* note 18, at 1236-38.

²⁰ See *id.* at 1238-43.

force as it does to exclusive resources. Because of the physical nature of common property, a prior user's expectations that the status quo will always prevail are less legitimate than the expectations of prior possessors of exclusive resources. A groundwater user must anticipate that pressure rates will drop as more users enter a basin and that the costs of extraction will correspondingly increase. A possessor of an exclusive resource, such as coal, need not anticipate any claims, short of theft, that the resource be shared with others.²¹

Because of the diminished expectations that arise in connection with shared resources, courts have been reluctant to protect all incidents of prior possession. Courts have not been convinced that the expectation of full preservation of the status quo is legitimate. Beyond the intuitive adoption of the argument that it is more efficient to allow new users into a basin with lower overall pumping levels than to close a basin in order to freeze existing pumping levels, courts have not progressed very far in defining the pressure level component of a groundwater right. In the Far West, legislatures have kicked the problem to administrative agencies, and many conservation regimes—such as mining restrictions, well spacing requirements and the coordination of ground and surface rights—have the effect of pressure level maintenance.²² For the South East and Middle West, the pressure level maintenance problem is largely unresolved.

II. GROUNDWATER: THE COMMON LAW

Eastern states have historically followed the English common law of groundwater use which is a pure rule of capture.²³ The right to use groundwater is incident to land ownership. This rule was a product of the nineteenth century attitude that individual

²¹ This analysis excludes any sharing claims made by the holder of the surface estate against the severed mineral interest for damages to the surface. *See, e.g.,* *Island Creek Coal Co. v. Rodgers*, 644 S.W.2d 339, 343-45 (Ky. Ct. App. 1982).

²² *See, e.g.,* ARIZ. REV. STAT. ANN. § 45-102 (West Cum. Supp. 1984-85) which provides for the establishment of the State Department of Water Resources. This department has all ground and surface water management responsibilities. *Id.* at § 45-103.

²³ NATIONAL WATER COMM'N, A SUMMARY DIGEST OF STATE WATER LAWS 49 (R. Dewsnap & D. Jensen eds. 1973).

discretion with respect to land use should not be fettered.²⁴ Under the "English rule" of groundwater use, developed in 1843 in *Acton v. Blundell*,²⁵ a landowner is entitled to extract water regardless of the consequences to surrounding landowners and users.²⁶ The American courts which followed this rule analogized groundwater to things *ferae naturae* and thus subject to capture.²⁷ As an additional basis for granting an unlimited right to capture, some nineteenth century courts reasoned that it was impossible or too costly to assign rights other than by self-help.²⁸ In the extreme, the English rule allowed unlimited pumping, even for wasteful and malicious purposes.²⁹ American courts soon rubbed the rough edges off the rule and enjoined malicious and wasteful pumping.³⁰ In practice, courts tended to merge these two concepts, defining pumping for a malicious purpose as waste.³¹ Beyond this limitation, there are no restrictions on an overlying landowner's right to use water under the classic English rule.³²

A rule of capture is appropriate when the costs of allocating a common resource are high and competing users are making similar uses of the resource. Capture is inefficient when the opportunity costs of excessive present consumption are high. The law of oil and gas use developed from a similar rule of capture in the nineteenth century, but by the early twentieth century the costs of excessive pumping had become manifest. Courts were unable to impose significant limitations on the rate of oil and gas extraction, and to curb excessive pumping, legis-

²⁴ See, e.g., *Wheatley v. Baugh*, 25 Pa. 528, 534 (Pa. 1855) ("The general principle undoubtedly is, that he who owns the soil has it even to the sky, and to the lowest depths. He may dig as deep and build as high as he pleases.").

²⁵ 152 Eng. Rep. 1223 (Exch. Ch. 1843). *Acton* was reaffirmed in *Langbrook Properties, Ltd. v. Surrey County Council*, [1969] 3 All E.R. 1424, 1430.

²⁶ 3 All E.R. at 1428.

²⁷ See, e.g., *Ohio Oil Co. v. Indiana*, 177 U.S. 190, 204 (1900).

²⁸ See, e.g., *Wheatley v. Baugh*, 25 Pa. 528, 534 (Pa. 1855). See also *Frazier v. Brown*, 12 Ohio St. 294 (1861) (any attempt to administer movements of water would be "practically impossible"), overruled in *Cline v. American Aggregates Corp.*, 115 Ohio St. 3d 384, 474 N.E.2d 324 (1984). For a brief explanation of aquifer mechanics, see Friedman, *supra* note 14, at 884-85.

²⁹ See *Huber v. Merkel*, 94 N.W. 354, 356 (Wis. 1903).

³⁰ See text accompanying notes 48-53 *infra* for a classic example.

³¹ See, e.g., *Gagnon v. French Lick Springs Hotel Co.*, 72 N.E. 849 (Ind. 1904). For a full explanation of this case, see notes 48-53 *infra* and accompanying text.

³² See Smith, *supra* note 8, at 641 n.2.

latures responded with conservation legislation that substituted legislatively defined correlative rights for the common law right of capture.³³ The progressive conservation era in the early twentieth century established the principle—which is still vigorously debated—that private property rights can be limited by the state,³⁴ but groundwater law was initially less influenced by this era.

The English rule underwent one substantial but ultimately limited modification in response to a technological and political problem that arose in the early twentieth century. Cities began to use high capacity wells sunk in well fields adjacent to farmland to extract large amounts of water for municipal supply. Farmers sued cities for well losses, and out of these suits came the American or reasonable use rule.³⁵

Under the American rule, groundwater is classified as an incident of land ownership, but three restraints are placed on extraction. First, the use must be reasonable.³⁶ Second, the use is restricted to overlying land.³⁷ Finally, all non-overlying use is per se unreasonable, although courts have demonstrated an increasing willingness to allow transfers that do not in fact cause injuries to overlying landowners.³⁸ The American rule, except as applied between overlying and nonoverlying owners, is not a rule of apportionment because there is no sharing among similarly situated users.³⁹ Once these requirements are met, an overlying land owner can extract all the water he wants to the point of dewatering a neighbor.⁴⁰

Because both the English and American rules are capture rules, the common law of groundwater use does not, in theory, encourage farmers to invest in supplemental irrigation. The insta-

³³ 1 H. WILLIAMS & C. MEYERS, OIL AND GAS LAW §§ 204.3-.6 (1984).

³⁴ The philosophical and historical antecedents of this concept are traced in Rose, Mahon *Reconstructed: Why The Takings Issue Is Still A Muddle*, 57 S. CAL. L. REV. 561, 587-92 (1984).

³⁵ See, e.g., *Forbell v. City of New York*, 58 N.E. 644, 644-46 (N.Y. 1900) (court upheld injunction preventing city from operating pumping station).

³⁶ See *Sainato v. Potter*, 159 A.2d 632, 634 (Md. 1960). See also Kramer & Turner, *Prevention of Waste or Unreasonable Use of Water: The California Experience*, 1979-80 AGRIC. L.J. 519, 519-31.

³⁷ A narrow definition of overlying use could hinder agricultural use in some states. See Looney, *supra* note 2, at 245.

³⁸ See, e.g., *Lingo v. City of Jacksonville*, 522 S.W.2d 403, 405 (Ark. 1975).

³⁹ Cf. *id.* at 406.

⁴⁰ See, e.g., *Finley v. Teeter Stone, Inc.*, 248 A.2d 106, 113 (Md. 1968).

bility of the groundwater right could in fact deter investment in supplemental irrigation systems. In practice, however, a capture rule may be a sufficient basis for an individual investment. The first pumper can use all the water that he needs, provided that he can afford to maintain his pumping rate against subsequent pumpers.

The real problem is that, from a social perspective, capture rules are both inefficient and unfair. A rule of capture may be unfair to prior, smaller pumpers who have limited means of protecting their investments against subsequent, larger pumpers. The constant displacement of pumping levels is socially undesirable because it tends to produce an inefficient allocation of resources. A groundwater basin is a common property resource where private property rights remain inadequately defined, and a user has no incentive to compare future versus present values of the resource. For this reason, unrestrained capture produces an inefficient use of the resource:

In the absence of a centralized decision rule or well-defined, enforced, and transferable property rights, externalities will arise and net value of the basin will not be maximized. Standard economic theory tells us that when there are many producing firms in the basin acting independently, each one pumping a small enough share of the total that it can economically ignore its own effect on groundwater stocks. The resulting decision rule under uncontrolled pumping would equate net marginal value of water in current production to zero instead of a positive value as would occur under optimal management. Obviously, uncontrolled pumping with many firms could be very wasteful of the groundwater resource.⁴¹

III. THE RESTATEMENT (SECOND) OF TORTS: TOWARD A TRUE SHARING RULE

The distinguishing feature of both the English and American or reasonable use rules, in contrast to the law of riparian rights governing allocation of surface waters, is that neither rule follows true general sharing principles. The basic argument for

⁴¹ Anderson, Burt & Fractor, *supra* note 11, at 233. See also note 10 *supra*.

groundwater law reform is that surface and groundwater rights should be the same. California began the reform in 1903 by applying the surface law of riparian rights to groundwater.⁴² California's correlative rights rule gives all overlying owners in a basin an equal right to an equitable share of the aquifer.⁴³ Among overlying owners, withdrawals cannot exceed the basin's safe yield, and nonoverlying owners can acquire rights only if there is a surplus over safe yield.⁴⁴

The correlative rights rule was long thought to be confined to California and Nebraska.⁴⁵ It was evidently assumed that the early twentieth century common law in the eastern United States had no sharing tradition, but such an assumption is erroneous. A close examination of some conservation era cases reveals that, although a sharing rule was not necessary to the disposition of many decisions, the courts were receptive to the development of sharing rules.⁴⁶ This subtle strain in the common law of groundwater use has become important because the Restatement (Second) of Torts [Second Restatement] cautiously reaches back to this tradition in its effort to modify the common law.

Receptivity to the development of sharing rules can be found in early Indiana and New York⁴⁷ cases. Illustrative of this development is *Gagnon v. French Lick Springs Hotel*.⁴⁸ *Gagnon* arose when the French Lick Springs Company sold a historic spa and springs to the French Lick Hotel Company and, in the process, froze out some of the shareholders of the French Lick Springs Company.⁴⁹ These shareholders joined with the Baden Lick Sulfur Springs Company, a rival hotel located up the valley from the French Lick Hotel, to destroy the source of French Lick's business.⁵⁰ *Gagnon*, who was Baden Lick's agent, and the

⁴² See *Katz v. Walkinshaw*, 70 P. 663 (Cal. 1902), *modified on reh'g*, 74 P. 766, 772 (Cal. 1903).

⁴³ See Smith, *supra* note 8, at 662-75 for an explanation of California's correlative rights rule.

⁴⁴ See *id.*

⁴⁵ See *Olson v. City of Wahoo*, 248 N.W. 304, 307-08 (Neb. 1933). See also *Jones v. Oz-Ark-Val Poultry Co.*, 306 S.W.2d 111, 115 (Ark. 1957) (correlative rights rule adopted in dictum).

⁴⁶ See notes 48, 77 *infra*.

⁴⁷ See notes 54-55 *infra* and accompanying text.

⁴⁸ 72 N.E. 849 (Ind. 1904).

⁴⁹ *Id.* at 850.

⁵⁰ *Id.*

frozen out shareholders drilled a number of wells for the sole purpose of pumping French Lick dry.⁵¹ "Following the lead of the later decisions [dealing with groundwater rights], which we think proceed upon just and correct principles" the court affirmed a temporary injunction against such pumping.⁵²

There are narrow explanations for the case. *Gagnon* could be explained as a case where springs were fed by a subterranean stream with defined banks, thus invoking the surface rules of riparian rights.⁵³ *Gagnon* is also classic example of malicious pumping, and the court may have done no more than to place a sensible limitation on the English rule. However—in linking the leading case, *Forbell v. City of New York*,⁵⁴ with the California correlative rights rule, which is a true sharing rule—the court's opinion shows great sensitivity to the underlying reasons for the adoption of the American rule:

[T]he courts of New York have held that the drainage of land of a private owner by a city pumping works, which exhausts from all the ground in its vicinity the natural supply of underground or subterranean water, and thus prevents the raising on it of crops to which it was or would be peculiarly adapted, or destroys such crops after they are grown or partly grown, renders the city liable to the landowner for the damages he sustains, and entitles him to an injunction against the continuance of the wrong. *Forbell v. New York*. . . . A further exception to the rules laid down in *Acton v. Blundell* . . . was made in the recent case of *Katz, Ex'r, v. Walkingshaw* . . . where it was declared that the owner of a portion of a tract of land which is saturated below the surface with an abundant supply of percolating water cannot remove water from wells thereon for sale, if the remainder of the tract is thereby deprived of water necessary for its profitable enjoyment. . . . The strong trend of the later decisions is toward a qualification of the earlier doctrine that the landowner could exercise unlimited and irresponsible control over subterranean waters on his own land, without regard to the injuries which might thereby result to the lands of other proprietors in the neighborhood.

⁵¹ *Id.* at 851.

⁵² *Id.* at 852.

⁵³ The opinion does not clearly describe the underground spring. *See id.* at 850-51.

⁵⁴ 58 N.E. 644 (N.Y. 1900).

Local conditions, the purpose for which the landowner excavates or drills holes or wells on his land, the use or nonuse intended to be made of the water, and other like circumstances have come to be regarded as more or less influential in this class of cases, and have justly led to an extension of the maxim, "Sic utere tuo ut alienum non laedat," to the rights of landowners over subterranean waters, and to some abridgment of their supposed power to injure their neighbors without benefiting themselves.⁵⁵

These early cases that recognize or at least are hospitable to true sharing rules influenced the drafters of the Second Restatement to announce new limitations on the common law rule of capture. Because water rights have traditionally been governed by tort, rather than property law, water use conflicts have been seen as liability, rather than property rights, questions.⁵⁶ Despite the convergence of these two classifications, this is a distinction with a difference. Liability rules are imposed after the fact and often on an ad hoc basis. The need for certainty in tort law to deter conduct has always been recognized,⁵⁷ but the need to compensate those injured by an activity has led courts to tolerate a much greater degree of uncertainty in the formulation of liability rules, as compared to property rules which are designed to induce reliance. For example, the Restatement of Torts [First Restatement] analogizes water use conflicts to nuisance cases and applies the same open-ended balancing test to both.⁵⁸ The First Restatement's balancing test, however, is inappropriate because it undercompensates⁵⁹ and asks extraneous questions. The balancing test is doubly wrong when applied to groundwater disputes because it prevents the definition of clear property rights. So many factors are relevant to the balancing that it is impossible to tell in advance of a conflict whether a property right will be recognized.⁶⁰ Obviously, no user has any incentive to tailor his conduct so as to avoid infringing on another's property right

⁵⁵ 72 N.E. at 852.

⁵⁶ See RESTATEMENT (SECOND) OF TORTS, ch. 41, introductory note, p. 181-83.

⁵⁷ Cf. PROSSER, HANDBOOK OF THE LAW OF TORTS 16 (4th ed. 1971).

⁵⁸ See RESTATEMENT OF TORTS §§ 850A, 822 (1939).

⁵⁹ See also note 18 *supra*.

⁶⁰ See RESTATEMENT OF TORTS § 850A (1939).

when no one can predict who has such a right. The net result is that balancing is both inefficient and unfair.

The drafters of the Second Restatement sought to mitigate the deficiencies of the First Restatement's approach by incorporating some stability into the sacred balancing test. Balancing was kept in form, but the drafters managed to incorporate prior appropriation principles into the common law by making "the protection of existing values of water uses, land investments and enterprises" a factor in the balancing.⁶¹ The addition of this factor is thought by many to be declarative of what common law courts in fact did⁶² and is a major advancement over the formulation of the abstract common law rules of water allocation.

The groundwater section of the Second Restatement incorporated the protection of prior users into the balancing for the express purpose of protecting small, as against large, users. Section 858 provides:

(1) A proprietor of land or his grantee who withdraws groundwater from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water by another, unless

(a) the withdrawal of groundwater unreasonably causes harm to a proprietor of neighboring land through lowering the water table or reducing artesian pressure,

(b) the withdrawal of groundwater exceeds the proprietor's reasonable share of the annual supply or total store of groundwater, or

(c) the withdrawal of the groundwater has a direct and substantial effect upon a watercourse or lake and unreasonably causes harm to a person entitled to the use of its water.

(2) The determination of liability under clauses (a), (b) and (c) of Subsection (1) is governed by the principles stated in §§ 850 to 857.⁶³

⁶¹ RESTATEMENT (SECOND) OF TORTS § 850A(h) (1979).

⁶² See, e.g., Beuscher, *Appropriation Water Law Elements in Riparian Doctrine States*, 10 BUFFALO L. REV. 448 (1961).

⁶³ RESTATEMENT (SECOND) OF TORTS § 858 (1979).

Restatement envisions a rule of capture among large pumpers who enter the basin at the same time, but contemplates a rule of prior appropriation between preexisting smaller and subsequent larger pumpers.⁶⁴

Section 858's principal change is to extend the protection which overlying owners have long enjoyed from large nonoverlying uses to include protection from large overlying uses as well. The comments make it clear that the determinative factor is whether the plaintiff's expectations of longstanding pumping conditions have been upset:

The withdrawal of a large quantity of water from an artesian formation by natural forces or pumping will reduce the artesian pressure over a similar area. If the land overlying the affected area is held in different ownerships, one person's large deep well equipped with a powerful pump may lower the water beyond the reach of the shallow well of his neighbor or cause the artesian well of a neighbor to cease to flow. There is usually water enough for all users, and the problem is one of who must bear the cost of deepening the prior well, drilling a new deep well, installing a pump, paying increased pumping costs or obtaining water from an alternate source.

In situations in which neighboring landowners use water for domestic or irrigation purposes on overlying land, both of the common law rules, absolute ownership and reasonable use . . . cast on each water user the burden of improving his own facilities or paying the additional costs when their joint activities lower the water table or reduce artesian pressure. However, in most cases in which a city or industry purchases ground water rights or a small tract of land and installs deep wells and high capacity pumps it increases considerably the demand on the ground water supply and the possibilities of harm to owners of neighboring land who use the common resource for domestic and agricultural purposes. The reasonable use rule in its original form met this problem by imposing liability for interference with neighboring wells and springs by withdrawing large quantities of water and piping it to distant places for municipal and industrial use. As usually stated, the rule gave no protection against identical harm caused by a large industrial plant or apartment house built on neighboring overlying land. Recently it has been

⁶⁴ See *id.* at comments a-h, illustrations 1-7.

recognized however, that the salient factor is not the place of the use but the withdrawal of water in unprecedented quantities for purposes not common to the locality, and that it is fair and just to place the cost of improving neighboring facilities upon the person or organization whose withdrawals render them inadequate, even though the water is used on the land from which it is withdrawn.

The rule of Clause (a) of this Subsection adopts this modern view, and bases the protection against loss of access to the water not on the single arbitrary factor of the place where the water is used, but on a consideration of whether, under all circumstances, the harm done by lowering the water table or pressure is unreasonable.⁶⁵

IV. ADOPTION OF THE SECOND RESTATEMENT AND BEYOND

Section 858 has been applied by the courts of Michigan, Ohio and Wisconsin and has been cited with approval by courts in Nebraska and New Jersey. Indiana alone has rejected it. In all cases where section 858 has been applied or has influenced a decision, a prior user had his supply drained by a subsequent pumper, and the court has applied section 858 to protect the prior against the subsequent user.

Wisconsin was the first state to apply section 858, and that state's adoption of the section was significant in light of the state's long adherence to the English rule.⁶⁶ In *State v. Michels Pipeline Construction Co.*⁶⁷ a sewage district contractor dewatered the soil around a sixty-inch diameter sewer line that he was constructing, and as a result, certain landowners suffered subsidence and decreased well capacity.⁶⁸ *Michels* reversed the leading Wisconsin case which had applied the full English rule, and adopted section 858 because "[w]ater users with superior economic resources should not be allowed to impose costs on smaller water users that are beyond their economic capacity."⁶⁹

⁶⁵ *Id.* at comment e.

⁶⁶ See *Huber v. Merkel*, 94 N.W. 354, 356 (Wis. 1903).

⁶⁷ 217 N.W.2d 339 (Wis. 1974).

⁶⁸ *Id.* at 340.

⁶⁹ *Id.* at 351 (overruling 94 N.W. 354).

Michigan has also applied section 858 in a case where the extractor would win at common law. In *Maerz v. United States Steel Corp.*,⁷⁰ a quarry dewatering operation caused nearby domestic wells to fail.⁷¹ The Michigan Court of Appeals reversed a partial summary judgment for the quarry owner, stating that section 858 is "more fair and just than the English rule or lesser modifications of the English rule, and should be followed in Michigan."⁷²

The Nebraska Supreme Court, in *Prather v. Eisenmann*,⁷³ held that a large center pivot irrigator who causes significant pressure level declines to domestic wells must pay the costs of deepening the wells.⁷⁴ The trial court had applied section 858,⁷⁵ but the supreme court chose to affirm the decision because of a statutory preference for domestic, as against agricultural, uses.⁷⁶ *Prather* creates a rule of competition within, not between, classes of users:

It is our statute which distinguishes the Nebraska rule from other rules. Under the statute, the use of underground water for domestic purposes has first preference. It takes priority over all other uses. As between domestic users, however, there is no preference or priority. Every overlying owner has an equal right to a fair share of the underground water for domestic purposes. If the artesian head in the present situation had been lowered by other domestic users, plaintiffs would be entitled to no relief so long as they still could obtain water by deepening their wells. If the water became insufficient for the use of all domestic users, each domestic user would be entitled to a proportionate share of the water. All domestic users, regardless of priority in time, are entitled to a fair share of the water in the aquifer.⁷⁷

⁷⁰ 323 N.W.2d 524 (Mich. 1982). On the last day of 1984, Ohio adopted § 858 and remanded for further proceedings a suit between 26 domestic well users and a quarry. See also *Cline v. American Aggregates Corp.*, 474 N.E.2d 324 (Ohio 1984).

⁷¹ 323 N.W.2d at 526.

⁷² 323 N.W.2d at 530.

⁷³ 261 N.W.2d 766 (Neb. 1978).

⁷⁴ *Id.* at 768.

⁷⁵ *Id.* at 770.

⁷⁶ See *id.* at 771 (applying NEB. REV. STAT. § 46-613 (1978) which provides that domestic use be given preference in the use of underground water).

⁷⁷ *Id.* at 766.

All states have a preference for domestic as against other uses so the *Prather* result could obtain in any state,⁷⁸ but at least one trial judge has not applied the statutory preference in a situation similar to that presented in *Prather*. In *Woodsum v. Township of Pemberton*,⁷⁹ a New Jersey trial court held that a small domestic well owner who suffered a well decline when a municipal well field was put in nearby could not recover any damages for pressure declines.⁸⁰ The plaintiffs abandoned their property after the water loss and claimed damages for the difference between the value of the land before and after the dewatering.⁸¹ The well could have been deepened at a cost of \$750.00 to \$1,700.00, but plaintiffs claimed that they had no funds for this purpose.⁸² On appeal, the superior court judge noted that the Second Restatement rule was close to the correlative rights rule,⁸³ and concluded that in an old leading decision, *Meeker v. City of East Orange*,⁸⁴ New Jersey had adopted the correlative rights rule.⁸⁵ Since the city in *Woodsum* was making a nonoverlying use, the plaintiffs could have probably prevailed under either the American or the correlative rights rules.⁸⁶ However, the trial judge faced squarely an issue that most courts have avoided: whether a right to a fixed pressure level is part of a groundwater right? The *Woodsum* court relied on the reasonable pumping level rules formulated in the Far West⁸⁷ in addressing this issue:

The landowner who provides for his domestic supply of water through a shallow well, possibly because of a high subterranean water table, and who constructs that well at a time when no other users affect his water supply, does so with the knowledge that other users may appear who may lower the

⁷⁸ E.g., *Evans v. Merriweather*, 4 III. (3 Scam.) 492 (1842).

⁷⁹ 412 A.2d 1064 (N.J. Super. Ct. Law Div. 1980), *aff'd*, 427 A.2d 615 (N.J. Super. Ct. App. Div. 1981).

⁸⁰ See *id.* at 1076.

⁸¹ *Id.* at 1067.

⁸² *Id.*

⁸³ *Id.* at 1072.

⁸⁴ 74 A. 379 (N.J. 1909).

⁸⁵ The court adopted this interpretation of *Meeker* from Hanks & Hanks, *The Law of Water in New Jersey: Ground Water*, 24 RUTGERS L. REV. 621, 650-61 (1969-70). See 412 A.2d at 1072.

⁸⁶ See 412 A.2d at 1070-72.

⁸⁷ See *id.* at 1074 (citing *Wayman v. Murray City Corp.*, 458 P.2d 861, 864-66 (Utah 1969)).

water table and diminish or eliminate his water supply. He is bound to share his water with such other users on a reasonable basis. Therefore, if his use is to be described as "reasonable," he must dig his well to a depth which anticipates the lowering of the water table by virtue of other "proper users". A subsequent purchaser of the property on which the well is located must take title subject to these continuing requirements. It would make no sense at all to permit a conveyance to defeat the rights of the third parties.⁸⁸

Woodsum was subsequently affirmed on different grounds. Since the plaintiffs had recovered more than the maximum possible damages—the costs of deepening the well—in a settlement from one defendant, all taking issues were adjudged moot at the time of the trial court's decision.⁸⁹

The trial judge's analysis, influenced by section 858, illustrates both the strengths and weaknesses of the balancing approach. First, any definition of groundwater rights must include both pressure and quantity components. However, the judge addressed the pressure component through the use of a fallacious balancing test. He asked whether the public need for the water was greater than the plaintiff's need. Not surprisingly, the judge decided that the public need for the water outweighed the plaintiff's right to an historic pressure level: "It is now even more necessary that private users of subterranean water acknowledge the public interest in that water source, an interest to which the Legislature has given increasing recognition. A reasonable use of such water is one which accommodates that public need."⁹⁰ This is an incomplete efficiency analysis because it assumes that rights should be assigned to persons who most likely would have purchased the resource in the open market. Clearly, if put to a choice, the township would have purchased plaintiff's water right to operate the well field, but this is not the end of the inquiry.

Efficiency is a compelling rationale for the assignment of property rights. However, allowing courts to assign rights, as the Second Restatement does, by choosing the higher over the lower valued use presents too many risks of arbitrary public

⁸⁸ *Id.* at 1076.

⁸⁹ *Woodsum v. Township of Pemberton*, 427 A.2d 615, 618 (N.J. Super. Ct. App. Div. 1981).

⁹⁰ See 412 A.2d at 1076.

action. Any welfare gain should be net of losses suffered to private individuals. To ensure the social gains of public actions are in fact net of individual losses, the law has sensibly insisted that compensation is due when property is taken.⁹¹ The trial judge in *Woodsum* correctly understood that he had to decide whether the plaintiff did have a recognized property right. But, instead of adopting a Restatement-based balancing test,⁹² he should have asked the traditional question which is more consonant with the compensation rationale: whether plaintiff's water use, including the pressure level, was customary in the community. At a minimum, any sharing rule should compensate a well owner who has drilled a well to a depth commonly found in the community and who suffers losses from subsequently drilled high-capacity wells.⁹³ Small, shallow wells present problems, because a court can reasonably conclude that such a well is substandard and thus has no protected preexisting pressure level. Well drilling codes could be a basis for distinguishing standard from substandard wells, but such codes ought not to be applied retroactively to deny compensation to average, yet substandard, wells.

Only one state, Indiana, has considered section 858 and rejected it. In *Wiggins v. Brazil Coal & Clay Corp.*,⁹⁴ a strip miner drained an artificial recreational lake, around which a

⁹¹ Cf. U.S. CONST. amend. IV.

⁹² See notes 58-66 *supra* and accompanying text.

⁹³ One commentator has suggested:

[E]astern groundwater allocation rules should be modified to reflect the current state of knowledge and the expense of hydrologic testing. There should be two rules, one applying to high-capacity wells and the other applying to small wells. High capacity wells should be defined as those wells that a reasonable man would not install without first making hydrologic tests to determine the availability of adequate groundwater supplies, or obtaining information previously developed by others yielding substantially the same results as new tests. With respect to such wells, the landowner should be charged with the knowledge the tests revealed about groundwater movement and effects on neighboring users of groundwater and stream water or, if the tests are not made, what they would have revealed. He should be held liable for any unreasonable injurious consequences which could have been predicted from the test results under the correlative rights rule of groundwater or some similar rule requiring a comparison of the reasonableness of conflicting uses.

Davis, *Wells and Streams: Relationship At Law*, 37 Mo. L. Rev. 189, 236 (1972).

⁹⁴ 440 N.E.2d 495 (Ind. Ct. App. 1982), *vacated*, 452 N.E.2d 958 (Ind. 1983).

small subdivision had been developed.⁹⁵ The trial court had ruled that the coal company was not liable because Indiana law prohibited only the intentional and malicious waste of groundwater,⁹⁶ but an intermediate appeals court reversed.⁹⁷ The Surface Mine Control and Reclamation Act's hydrologic balance requirements, which protect water tables from diminution because of surface mining,⁹⁸ were construed to require that state law protect water users from the adverse effects of strip mining.⁹⁹ Section 858 was identified as a proper avenue through which to protect the plaintiff's federally mandated rights.¹⁰⁰ The theory that federal law requires the adoption of section 858 was probably wrong, but the court's reading of the hydrologic balance requirement is at least consistent with another court's subsequent construction of United States Department of Interior regulations.¹⁰¹ On a motion to transfer, the court of appeals' decision was vacated and the trial judge's ruling was reinstated.¹⁰²

In *Wiggins*, section 858 was brushed aside with the conclusion that it was not applicable because it did not directly govern the case.¹⁰³ To support its holding that the strip miner was not liable, the court misread the Indiana decision in *Gagnon v. French Lick Springs Hotel Co.*¹⁰⁴ Instead of recognizing, as have other courts and scholars, that *Gagnon* departed from the Eng-

⁹⁵ *Id.* at 496.

⁹⁶ *Id.* at 497.

⁹⁷ *Id.* at 496.

⁹⁸ See 30 U.S.C. § 1260(b)(3) (1982). See generally Israel, *Emerging Federal and State Conflicts Affecting Western Coal Development*, 26 ROCKY MT. MIN. L. FDN. 157 (1980).

⁹⁹ 440 N.E.2d at 498-500.

¹⁰⁰ See *id.* at 500-01.

¹⁰¹ See *In re Permanent Surface Mining Regulation Litigation*, 21 ENV'T REP. CAS. (BNA) 1724 (D.D.C. 1984) (hydrologic balance requirement applies regardless of whether farming occurs). Cf. *Wiggins v. Brazil Coal & Clay Corp.*, 452 N.E.2d 958, 965 (Ind. 1983) (Hunter, J., dissenting).

¹⁰² See 452 N.E.2d 958, 959 (Ind. 1983). See also *Irving Materials, Inc. v. Carmody*, 436 N.E.2d 1163, 1164-65 (Ind. Ct. App. 1982) (applying *Gagnon* in holding that reasonable land use is legal and permits no award for damages). Vermont reaffirmed the absolute ownership rule in 1973. See *Drinkwine v. State*, 300 A.2d 616, 617-18 (Vt. 1973).

¹⁰³ See 452 N.E.2d at 963.

¹⁰⁴ See notes 48-53 *supra* and accompanying text for a discussion of *Gagnon*.

lish rule,¹⁰⁵ the Indiana Supreme Court incorrectly read the case as applying the "law governing property in water as that law had been previously applied in Indiana."¹⁰⁶ Prior cases had adopted the English rule with no qualifications, and *Gagnon* not only rejected the full force of the English rule but looked toward a true sharing rule. To compound its error, the court analogized the case to surface run-off conflicts and applied an Indiana case¹⁰⁷ which holds that a surface owner can repel water and "throw such water back upon higher land, so long as it is not passing through a natural channel or watercourse."¹⁰⁸

The analogy between the rules of surface drainage and those governing groundwater rights is often urged in dewatering cases, but it is a false comparison.¹⁰⁹ There is more need for a sharing rule for the allocation of groundwater among competing users than for rules, such as the law of drainage and surface water repulsion, which constrain the development of property. Because a landowner has a well-defined package of property rights, he can more easily protect himself from interference through a combination of bargains with surrounding landowners and the use of established common law tort rules restricting the improv-

¹⁰⁵ An Indiana study concluded:

Even if the absolute ownership doctrine pertaining to groundwater still applied in Indiana after [*Gagnon*], it is unlikely that the rationale for applying it exists today. The reason given by the early courts for using the absolute ownership doctrine was that the location and quantity of groundwater was unknown and unknowable. However, in the years since those early cases were decided, the sciences of hydrology and geology have evolved to the point that there is a greatly increased potential for predicting the location, amount, and flow patterns of water below the earth's surface. Therefore, in light of the more equitable doctrines that have evolved in other areas of water law such as the reasonable use doctrine for riparian owners it is unlikely that the absolute ownership doctrine would be strictly applied today.

THE GOVERNOR'S WATER RESOURCE STUDY COMMISSION, *THE INDIANA WATER RESOURCE: AVAILABILITY, USES AND NEEDS* 96 (1980).

¹⁰⁶ 452 N.E.2d at 964. The two groundwater cases which preceded *Gagnon* were *New Albany & Salem R.R. v. Peterson*, 14 Ind. 112 (1860) and *City of Greencastle v. Hazelett*, 23 Ind. 186 (1864). These cases did apply the English, or absolute ownership, rule, but *Gagnon* expressly refused to follow this rule to its logical end. See 72 N.E. at 851.

¹⁰⁷ *Taylor, Adm'r v. Fickas*, 64 Ind. 167 (1878).

¹⁰⁸ 452 N.E.2d at 963.

¹⁰⁹ See generally *Hanks & Hanks*, *supra* note 85, at 630-48. See also *Friendswood Dev. Co. v. Smith-Southwest Indus.*, 576 S.W.2d 21, 27-28, 30 (Tex. 1978) (even under English rule, groundwater users prospectively liable for negligent pumping).

er's right to change natural drainage patterns. Where property rights are undefined, as they are with respect to Indiana groundwater, a claimant cannot protect himself against other users in this manner, and if many pumpers exist, there will be very little incentive to cooperate to restrain the rate of pumping.¹¹⁰ There is therefore a need to define the rights of competing users in a way that promotes sharing.

A federal district court refused to follow *Wiggins* in *Prohosky v. Prudential Insurance Co.*,¹¹¹ a conflict between a large-scale supplemental irrigator and a number of small farmers and domestic well owners. The insurance company in *Prohosky* purchased a 21,000 acre ranch in northern Indiana and leased large tracts of land to farmers for the purpose of growing corn, with the stipulation that the lessees install and use center pivot irrigation systems. During the summers of 1982, 1983 and 1984, a number of small wells in areas around Prudential's land went dry and some of the well owners who claimed to be affected by the irrigation pumping sued in federal district court.

Wiggins suggested that either malicious or gratuitous pumping might be actionable.¹¹² Malicious pumping is a well understood concept, but gratuitous pumping is not, and the federal district court took seriously its *Erie* duties to look to both case law and statutory sources to resolve doubtful questions of state law. After an examination of the evolution of Indiana common law and of state laws which restrict ground water uses in emergency situations, the court concluded:

When one looks at the totality of the common law and the full sweep of the aforesaid enactments by the Indiana General Assembly there is a clearly emerging legislative intent in the State of Indiana to rub off the hard edges of the common law in regard to the absolute right of an owner of land to extract ground water from the area underlying that land for any purpose in an unlimited amount. Given its factual

¹¹⁰ A recent study of cooperative operations of Texas and Oklahoma oil fields from 1926-1935 concludes that voluntary cooperation is most likely when there are only a few large operators. See Libecap & Wiggins, *Contractual Responses to the Common Pool*, 74 AM. ECON. REV. 87, 92-97 (1984). See generally M. OLSON, *THE LOGIC OF COLLECTIVE ACTION* (1966).

¹¹¹ 584 F. Supp. 1337 (N.D. Ind. 1984).

¹¹² See 452 N.E.2d at 964.

setting, *Wiggins* is only of limited value in deciding this case and in fixing the relative rights of adjacent landowners with regard to the extraction of ground water in massive amounts from beneath closely located tracts of land.¹¹³

The court then construed "gratuitous pumping" expansively to include the use of water for no valid or an extremely limited social purpose. The relevant issues were defined as "(1) whether the water is being used to further the enjoyment of the user's land; (2) whether use of the water is proceeding in a usual and proper manner; or, alternatively, (3) whether water is being wasted."¹¹⁴ Applying these criteria, the court concluded that some plaintiffs may have demonstrated a sufficient interconnection between Prudential's pumping and their water supply to merit damages,¹¹⁵ but the level of proof was insufficient for injunctive relief.¹¹⁶ The court did enjoin one wasteful pumping practice, *i.e.*, spraying water from endguns on the irrigation system on the public highways,¹¹⁷ and appointed a monitor to evaluate plaintiffs' complaints about lost water.¹¹⁸ Jurisdiction was retained to decide if plaintiffs were entitled to damages.¹¹⁹ The Seventh Circuit held that the injunction against endgun spraying was an abuse of the trial court's discretion under Indiana law because plaintiffs failed to introduce sufficient evidence to show a causal connection between the spraying and any resulting injury to individual water users. The case was remanded for trial on the damage issue, and the court of appeals did not discuss the trial judge's analysis of "gratuitous" pumping so, at least in the Seventh Circuit, there may be real limitations on large-scale groundwater use in Indiana.¹²⁰

All groundwater conflicts present difficult cause-in-fact issues given the inexactitude of the science of geohydrology. But once an interconnection between pumping and subsequent drawdown is established, a plaintiff should not be *per se* barred from recovery by capture rules.

¹¹³ 584 F. Supp. at 1344.

¹¹⁴ *Id.* at 1343. See generally *Kramer & Turner*, *supra* note 36.

¹¹⁵ See 584 F. Supp. at 1343.

¹¹⁶ *Id.* at 1350-52.

¹¹⁷ See *id.* at 1351.

¹¹⁸ See *id.* at 1352.

¹¹⁹ *Id.*

¹²⁰ *Prohosky v. Prudential Insurance Co.*, 767 F.2d 387 (7th Cir. 1985).

VI. LEGISLATIVE MODIFICATION OF THE COMMON LAW

Some nonappropriation states have recently moved to the administrative regulation of groundwater use, but the regulatory schemes have just begun to address the problem of supplemental irrigation. The situation in Kentucky illustrates the ineffectiveness of permit systems. Groundwater withdrawals are covered in the state's 1966 permit system, but all domestic and agricultural withdrawals are exempt from the permit requirement.¹²¹ A few states such as Iowa have comprehensive permit programs,¹²² but the impact on groundwater withdrawals has been minimal. Indiana,¹²³ New Jersey,¹²⁴ Georgia¹²⁵ and Virginia¹²⁶ have statutes that allow the state to limit high capacity wells on an emergency basis in times of drought, but these statutes permit only ad hoc responses to specific problems. In response to the problem that caused the litigation in *Prohosky*, Indiana passed legislation in 1982 which applied only to the two counties affected by the corn irrigation supplemental withdrawals.¹²⁷ The Director of Natural Resources is authorized to shut down or limit high capacity wells that substantially lower the water table and cause domestic and livestock use wells, which comply with state law, to fail to deliver their normal supply.¹²⁸ In the summer of 1984, the Director of the Department of Natural Resources shut down four of Prudential's wells "until such time as the Department determines that groundwater levels have sufficiently recovered to protect neighboring and livestock and domestic wells."¹²⁹ In 1985, Indiana adopted a statewide system that allows the Director of Natural Resources to declare restricted use areas and to limit pumping by sources withdrawing over 100,000 gallons per day.¹³⁰

¹²¹ See KY. REV. STAT. ANN. § 151.140 (Bobbs-Merrill 1980). See generally Ausness, *Water Rights Legislation in the East: A Program For Reform*, 24 WM. & MARY L. REV. 547 (1983); Ausness, *Water Use Permits in A Riparian State: Problems and Proposals*, 66 KY. L.J. 191 (1977-78).

¹²² See IOWA CODE ANN. §§ 455B.268-.269 (West Supp. 1984-85).

¹²³ See IND. CODE ANN. § 13-2-2-5 (Burns 1981).

¹²⁴ See N.J. STAT. ANN. § 58:1A-15 (West 1982).

¹²⁵ See GA. CODE ANN. §§ 12-5-95 to 12-5-422 (1982).

¹²⁶ See VA. CODE §§ 62.1-44.35 to 62.1-44.44 (Michie Cum. Supp. 1984).

¹²⁷ See IND. CODE ANN. § 13-2-2.5-1 (Cum. Supp. 1984).

¹²⁸ IND. CODE ANN. § 13-2-2.5-3 (Cum. Supp. 1984).

¹²⁹ Emergency Order of the Indiana Department of Natural Resources, July 23, 1984.

¹³⁰ IND. CODE ANN. § 13-2-2.5-2-12 (Cum. Supp. 1985).

Minnesota has the most extensive regulation of agricultural groundwater withdrawals in the eastern United States, but it is too early to tell if the Minnesota scheme is a worthy model for other Middle Western and South Eastern states. All major agricultural withdrawals in Minnesota require a state permit.¹³¹ The state has five priorities or use preferences.¹³² Domestic use "excluding industrial and commercial uses of municipal water supply" is first¹³³ and agricultural irrigation in excess of 10,000 gallons per day is third.¹³⁴ There are two classes of groundwater permits.¹³⁵ Class A permits are for areas of the state where adequate groundwater data exists and Class B permits are for all other areas.¹³⁶ Nonetheless, extensive geological and hydrologic information, including a pumping test, must accompany a Class B permit application.¹³⁷ The statute speaks of irrigation appropriations, but the term does not refer precisely to the classic doctrine of prior appropriation in force in the western states for surface waters.¹³⁸ The statute requires all well owners to construct wells in accordance with a state code. Once this is done the statute protects these well owners from interference from subsequent pumpers:

The commissioner shall issue permits for irrigation appropriation from groundwater only where he determines that proposed soil and water conservation measures are adequate based on recommendations of the soil and water conservation districts and that water supply is available for the proposed use without reducing water levels beyond the reach of vicinity wells constructed in accordance with the water well construction code. . . .¹³⁹

There is, however, no attempt to allocate supplies in times of shortage by a priority schedule. Minnesota has done what, in

¹³¹ MINN. STAT. ANN. § 105.41 (West. Supp. 1985).

¹³² *See id.*

¹³³ *Id.*

¹³⁴ *See id.*

¹³⁵ MINN. STAT. ANN. § 105.416 (West Supp. 1985).

¹³⁶ *See id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ MINN. STAT. ANN. § 105.416(3).

effect, many western states have done to allocate groundwater.¹⁴⁰ The state decides how many pumpers may enter a basin but does not attempt to allocate further supplies among the pumpers once the basic entry decision is made.

Any legislative redefinition of groundwater rights will be challenged as a taking of private property without due process of law. The landowner's argument is always that the common law rule creates a vested property right that cannot be abridged by the legislature. Courts have not accepted this taking argument and have sustained legislative redefinitions against taking challenges.¹⁴¹ The issue is not difficult when compared with other taking issues.¹⁴² Unlike rights to surface estates and infringements on development potential, groundwater claimants never knew just what they had at common law until rights among pumpers were adjudicated. For this reason groundwater claims were always inherently unstable because of the reciprocal external effects of pumping, and thus any expectations as to quantity and fixed pumping levels were inherently speculative. Legislatures have long had the power to redefine property rights among common pool owners to *enhance* the protection of correlative rights,¹⁴³ and under most legislative redefinitions of groundwater rights, pumpers as a class end up with more secure rights than they had before the regulation. This special characteristic of groundwater has been a sufficient basis for courts to conclude that there has been no taking.¹⁴⁴

CONCLUSION

As groundwater use for supplemental irrigation increases, conflicts among pumpers will occur. Courts and, to a lesser

¹⁴⁰ C. MEYERS & A.D. TARLOCK, *WATER RESOURCE MANAGEMENT* 689-90 (2d ed. 1980).

¹⁴¹ See, e.g., *Town of Chino Valley v. City of Prescott*, 638 P.2d 1324, 1326-27 (Ariz. 1981); *Williams v. City of Wichita*, 374 P.2d 578, 595 (Kan. 1962), *appeal dismissed*, 375 U.S. 7 (1963); *Crookston Cattle Co. v. Minnesota Dep't of Natural Resources*, 300 N.W.2d 769, 774-75 (Minn. 1980).

¹⁴² See Epstein, *Not Deference, But Doctrine: The Eminent Domain Clause*, 1982 SUP. CT. REV. 351.

¹⁴³ See, e.g., *Lindsley v. Natural Carbonic Gas Co.*, 220 U.S. 61, 75-76 (1911); *Ohio Oil Co. v. Indiana*, 177 U.S. 190, 211-12 (1900).

¹⁴⁴ See Kelly, *Management of Groundwater Through Mandatory Conservation*, 61 DEN. L.J. 1, 21-24 (1983) (analyzes traditional taking theories, focusing on the diminution in value theory).

extent, legislatures will be called upon to replace capture with sharing rules. This Article has suggested that there are both efficiency and fairness reasons which point toward such reform. Sharing rules are the first step toward the definition of property rights which promote groundwater conservation and the more efficient allocation of resources. A fairness analysis suggests that courts divide supplemental irrigation conflicts into two classes. A suit by a prior, small well owner against a subsequent large-scale pumper ought to be treated differently from suits among high capacity pumpers. In the first case compensation (and, in appropriate cases, injunctive relief) ought to be the presumptive rule where the plaintiff can prove physical interference among wells. At the present time, there is less need for judicial intervention in the second class of cases. If supplemental irrigation conflicts approach the scale of western conflicts, there will be a great incentive for the pumpers themselves to seek legislative and administrative conservation regimes.¹⁴⁵ There are no constitutional impediments to the redefinition of property rights, but modification of the rule of capture for conflicts among large scale pumpers in the Middle West and South East may be premature. If, however, substantial pumping restrictions among large-scale supplemental irrigators are necessary to conserve a common supply, the modest steps discussed in this Article toward the adoption of sharing rules will be important precedents for legislative schemes which assign firmer correlative rights.

¹⁴⁵ One commentator, for example, recommends the creation of critical area districts with the power to mandate across the board cutbacks as the best method to conserve supplemental irrigation supplies in impacted areas. See Trelease, *A Water Management Law for Arkansas*, 6 U. ARK. LITTLE ROCK L.J. 369, 374-82 (1983).