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Diffused Surface Water: Reasonable Use Has Become the Common Enemy

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I. Introduction.

Diffused surface water, caused by precipitation, should be treated as a necessary asset to replenish aquifers used for drinking water, and not as waste to be disposed of by landowners. Groundwater aquifers were created, and can only be replenished, by precipitation that is allowed to seep underground.[2] Ninety-nine percent of the drinking water for people in rural areas of America comes from groundwater aquifers.[3] These aquifers are in danger of being contaminated or depleted, which could result in severe water shortages very soon.[4] Twenty percent of the people in the world, or 1.4 Billion people, do not have adequate clean water.[5] A water crisis will be much more devastating than an energy crisis, because there are alternative energy sources, but no alternatives to clean water.[6] Legislators have failed to enact a comprehensive system to regulate the use of aquifers, relying instead on a plethora of conflicting federal laws, inconsistent state laws, and town ordinances.[7] Courts have dealt with precipitation, and the storm runoff that results, as a "common enemy" of landowners, something to be disposed of, rather than a valuable and necessary asset.[8]

Severe droughts in the northeast in recent years have drawn attention to the problems caused by a lack of water.[9] In 1999, the U.S. Environmental Protection

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[2] Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804 (1996); see also http://www.groundwater.org/GWBasics/gwbasics.htm, last visited July 2, 2003 ("Groundwater begins as precipitation and soaks into the ground where it is stored in underground geological water systems called aquifers"); http://www.edwardsaquifer.net/charts.html#recharge, last visited July 2, 2003 (noting that precipitation is the only source of recharge for the Edwards Aquifer near San Antonio, Texas.)

[3] http://www.groundwater.org/GWBasics/gwbasics.htm, last visited July 2, 2003; see also United States Environmental Protection Agency, Office of Water, "Citizen's Guide to Ground-Water Protection, EPA 440/6-90-004, at iii, April, 1990 ("Approximately one-fourth of all fresh water used inn the nation comes from groundwater".)

[4] Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804 (1996); see also http://www.groundwater.org/GWBasics/gwbasics.htm, last visited July 2, 2003.

[5] Diane Raines Ward, Water Wars, at 2, Riverhead Books, 2002.

[6] Id. at 4.

[7] United States Environmental Protection Agency, Office of Water, "Citizen's Guide to Ground-Water Protection, EPA 440/6-90-004, at iii, April, 1990 ("the responsibility for protecting a community's ground-water supplies rests substantially with the local community."); see also Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804- 805 (1996).

[8] See Joseph W. Dellapenna, "The Legal Regulation of Diffused Surface Water," 2 Vill. Envtl. L.J. 285, 287 (1991).

[9] See Kenneth S. Gould, "An Introduction to Water Rights in the Twenty-First Century: The Challenges Move East," 25 U. Ark. Little Rock L. Rev. 3, 3 (2002).

Agency estimated the drinking water infrastructure needs for this country exceeded $150.9 Billion through 2018.[10] One reason for the water shortage is the diversion of diffused surface water, which is thereby prevented from replenishing aquifers.[11] Aquifers are large underground reservoirs, often underlying several states, which depend on rainwater, snowfall, and streams to replenish or recharge.[12] Precipitation, in the form of rain or snow, is the source of virtually all freshwater available for drinking,[13] yet the diversion of precipitation has been more of a focus than its collection or preservation. Courts have traditionally been concerned with the damages to property caused by draining or diverting storm water runoff, rather than considering it a resource to be used as a water source.[14] The common law regulating use of underground water and diversion of diffused surface water was developed before the science of hydrogeology could predict the impact of such laws on water supply.[15] Hydrogeology is now better able to predict the location of the watershed area where the precipitation recharges the aquifer, the rate of such recharge, and the impact of excessive withdrawals or overdraft.

Many of the largest aquifers in the U.S. are being depleted, which can cause salt water intrusion in aquifers near the ocean[16] or subsidence, where the land surface sinks.[17] Aquifers supply fifty percent of the U.S. population, ninety-nine percent of the U.S. rural population, and ninety-two percent of the population of Florida, with drinking water.[18] Although aquifers straddle state lines, there is no comprehensive federal law to regulate the use of aquifers.[19]

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[10] Water Systems Counsil, "An Analysis of Existing Mandatory Hookup Legislation", http://watersystemscouncil.org, last visited 6/16/03.

[11] See Kenneth S. Gould, "An Introduction to Water Rights in the Twenty-First Century: The Challenges Move East," 25 U. Ark. Little Rock L. Rev. 3, 3 (2002); see, also, William R. Walker et als, "Management of Water Resources for Drought Conditions", R.W. Paulson et als, Compilers, National Water Summary, 1988-1989 – Hydologic Events and Floods and Droughts: U.S. Geological Survey Water-Supply Paper 2375, p. 147-156, at *6, http://geochange.er.usgs.gov/sw/responses/management/.

[12] Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804 (1996); see also http://www.groundwater.org/GWBasics/gwbasics.htm, last visited July 2, 2003 ("Groundwater begins as precipitation and soaks into the ground where it is stored in underground geological water systems called aquifers"); http://www.edwardsaquifer.net/charts.html#recharge, last visited July 2, 2003 (noting that precipitation is the only source of recharge for the Edwards Aquifer near San Antonio, Texas.)

[13] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Natural Processes of Ground-Water and Surface-Water Interaction," at p. 1, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003

[14] See Joseph W. Dellapenna, "The Legal Regulation of Diffused Surface Water," 2 Vill. Envtl. L.J. 285, 287 (1991).

[15] 3 "Waters and Water Rights" §18.01, The Michie Company, 1991.

[16] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 42, http://www.swfwmd.state.fl.us last visited July 9, 2003.

[17] Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804- 805 (1996). Land near Las Vegas has sunk as much as six to eight feet in areas because of depletion of aquifers, with the result that some buildings have been abandoned. Diane Raines Ward, "Water Wars" at 68.

[18] Id. at 806; see also http://www.groundwater.org/GWBasics/gwbasics.htm, last visited July 2, 2003 "According to United States Geological Survey (USGS) figures, groundwater provides an

When soil is covered with a building or paving, diffused surface water is prevented from following its natural course, and either a drought or flood can result. Wetlands surrounding rivers have been drained for development, so floodwaters now flood the buildings that replaced the wetlands.[20] Precipitation cannot reach the aquifer if the land is covered with buildings or pavement.[21] If more than 10-15% of the total surface area of any watershed (the aquifer recharge area) is covered with impervious cover, the rate and volume of runoff increases significantly.[22] Stripping off vegetation and changing the grade of land can also cause silt and sediment to be deposited on neighboring lands or bodies of water.[23] The increased runoff can cause flooding, as it did in May, 2002 in Southwest Virginia and Southern West Virginia.[24]

While some areas are suffering floods, other nearby regions were plagued with droughts. In the summer of 2002, Virginia faced a crisis when stream flows and ground water levels reached record lows.[25] In 1999, Maryland experienced one of the worst droughts in its recorded history.[26] At the same time, many areas were ravaged by local flooding caused by alterations in uphill property.[27] It is hereby suggested that a more comprehensive, unified, and environmentally sound approach to diffused surface water would limit the fluctuations between flood and drought. Municipalities should consider the impact on aquifers and properties at lower elevations when granting building permits. Green islands should be required to break up large areas of paving, allowing absorption of water into the soil and aquifers.

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estimated: **22%** of all freshwater withdrawals; **37%** of agricultural use (mostly for irrigation); **37%** of the public water supply withdrawals; **51%** of all drinking water for the total population;**99%** of drinking water for the rural population."

[19] 30 U.S.F. L. Rev at 820. (arguing for the benefit of a comprehensive federal total aquifer management act.); "Currently, there is rapidly growing concern over existing and possible future pollution of groundwater and the inadequacy of the current federal scheme to deal with it. Although it has been argued that the Clean Water Act (CWA) generally authorizes regulation of groundwater pollution, the Act is ambiguous, and the courts in a series of well injection cases came to differing conclusions." 5 "Waters and Water Rights" §55.01, The Michie Company, 1991

[20] Diane Raines Ward, "Water Wars" at 165.

[21] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 52, 84 http://www.swfwmd.state.fl.us last visited July 9, 2003.

[22] Carol R. Collier and Jan Bowers, "Droughts, Floods and Sprawl – They're All Connected", http://www.state.nj.us/drbc/stormwater.htm, last visited June 12, 2003.

[23] Hall v. Wood, 443 S.2d 834, 837 (Miss. 1983).

[24] http://www.redcross.org/news/ds/floods/020507wvfloods.html. last visited June 30, 2003

[25] Ellen Qualls, "Governor Warner Appoints Drought Co-ordinator" August 26, 2002 press release, http://vdem.state.va.us/newsroom/warnerreleases/drought_coord.htm.

[26] F. Pierce Linaweaver, Chairman, "Maryland Technical Advisory Committee on Water Supply Infrastructure", Final Report October 2000.

[27] http://www.redcross.org/news/ds/floods/020507wvfloods.html. last visited June 30, 2003. Although reports of the May 2003 flooding in Appalachia note the unusual volume of rainfall, there is no dispute that the impact of the heavy rain was made more devastating by the alterations made at higher elevations by strip mining operations. *See* GERALD M. STERN, THE BUFFALO CREEK DISASTER 11 (1976) (quoting one West Virginia flood survivor as stating, "I didn't see God running any bulldozer"); RANDALL NORRIS AND JEAN-PHILIPPE CYPRÉS, WOMEN OF COAL 16 (Univ. Press of Ky. 1996)

There are currently four different standards applied by courts to determine liability when a property owner's diversion of diffused surface water damages the property of an owner at a lower elevation. The existence of four standards creates confusion and a lack of predictability. Landowners are unable to avoid liability because of the difficulty of predicting how a court will view the result of their actions. Additional confusion is caused by the different standards that are applied by courts to riparian rights of landowners who own property adjacent to streams and lakes, as well as ownership of groundwater, or rights to ocean coastlines.[28] These types of water are inter-related; rainwater collects on the surface as diffused surface water, then flows into streams that flow into ponds or seep into aquifers.[29] Another problem is that state law applies to surface water that knows no legal boundaries and may flow across state lines.[30] For example, the Floridan aquifer underlies Alabama, Georgia, South Carolina, and Florida.[31] Surface water flowing into the Floridan aquifer is subject to the Modified Common Enemy rule in Alabama and South Carolina, the Civil Law rule in Georgia, and the Reasonable Use rule in Florida.[32] A single standard that takes into consideration the recharge of aquifers would be simpler to apply, result in greater fairness and predictability, and protect fresh drinking water.

This article suggests standards to be applied by courts to determine what is reasonable use, and argues that all states should use one consistent standard for diffused surface water. It is also suggested that land development and water use must be treated as inter-dependent resources, and comprehensive federal legislation to protect groundwater should include regulation of diffused surface water.

The focus of this article is the right to divert or use surface water, liability for such diversion, and the problems caused by such diversion, including aquifer overdraft and depletion. This article does not address pollution of groundwater, which is a serious and life-threatening problem.[33] This article will be limited to the quantity of surface water, with only a limited discussion of its impact on groundwater quality. This limitation is not intended to belittle the devastating problem of aquifer contamination, and other forms of water pollution.

II. Definition of Diffused Surface Water

Diffused surface water has been defined as "the water from rains, springs, or melting snows which lies or flows on the surface of the earth but does not form part of a well-defined body of water or a natural watercourse. It does not lose its character as

[28] See, e.g., Water Systems Council, "Who Owns the Water: A Summary of Existing Water Rights Laws", http://www.watersystemscouncil.org, last visited 6/16/03.
[29] See 5 "Waters and Water Rights" §59.01, The Michie Company, 1991.
[30] See Kenneth S. Gould, "An Introduction to Water Rights in the Twenty-First Century: The Challenges Move East," 25 U. Ark. Little Rock L. Rev. 3, 6 (2002).
[31] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 53, http://www.swfwmd.state.fl.us last visited July 9, 2003.

[32] Westland Skating Center, Inc. v. Gus Machado Buick, Inc., 542 So.2d 959, 962 (Fla. 1989).
[33] See Jonathan Harr, "A Civil Action," Random House, New York, 1995.

surface water merely because some of it may be absorbed by or soaked into the marshy or boggy ground where it collects." [34] A natural watercourse, the water from which is excepted from the rules pertaining to diffused surface water, has been defined as "[o]ne through which water regularly, though not constantly, flows along and through an identifiable and more or less permanent course, which includes among its features a bed where a natural stream of water runs."[35]

III. Description of the Four Rules

Courts currently apply one of four different rules or standards to determine liability for diversion of diffused surface water:

1. The Common Enemy Doctrine: all landowners can divert or block diffused surface water without liability
2. Modified Common Enemy: landowners are not liable for diverting water unless they block a natural drainway, collect water and channel it, or fail to exercise due care.
3. Civil Law or Natural Flow: a landowner who interferes with the natural flow of diffused surface water is liable.
4. Reasonable Use: landowners will not be liable so long as the resulting interference with the plaintiff's land is not unreasonable.

Several states impose even more complex schemes by statutes that use a different standard depending on whether the land is within city limits[36], or has been artificially improved[37], or if the water has reached a drainway.[38] Some states impose different rules depending on whether the property is considered urban or rural.[39]

To illustrate the differences between the four rules, suppose A paves his entire lot, causing B, a landowner at lower elevation, to suffer a flooded basement. In response, B builds a flood- wall at his property line, causing the storm runoff from A's lot to back up and pool on a portion of A's lot. A and B bring actions against each other.

1. Under the Common Enemy rule, A is not liable and B is not liable.
2. Under the Modified Common Enemy rule, A is not liable unless he acted in bad faith, but B is liable.
3. Under the Civil Law rule, A is liable, B is not liable.
4. Under the Reasonable Use rule, it is necessary to balance the benefits and harm to each party to determine liability.

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[34] Butler v. Bruno, 341 A.2d 735, 737 (R.I. 1975); see also Prof. Ronald A. Kaiser, "A Primer on Texas Surface Water Law For The Regional Planning Process," presented October 1, 1998, http:// www.bickerstaff.com/waterlawfeature/kaiser.htm last reviewed 6/16/03.
[35] Romine v. Gagle, 782 N.E.2d 369, 381 (In. 2003)
[36] Williamson v. Hays, 64 P.2d 364 (Kan. 2003).
[37] Westbury Realty Corp. v. Lancaster Shopping Center, Inc., 152 A.2d 669, 671-72 (Pa. 1959); Westland Skating Center Inc. v. Gus Machado Buick, Inc., 542 S.2d 959, 963 (Fla. 1989).
[38] Nu-Dwarf Farms v. Stratbucker Farms, 470 N.W.2d 772 (Neb. 1991).
[39] Stanley v. Kinyon and Robert C. McClure, "Interferences with Surfaced Waters," 24 Minn. L. Rev. 891, 931 (1940).

In recent years, there has been a shift toward the Reasonable Use rule.[40] The following twenty-one states have adopted the **Reasonable Use** rule: Alaska[41], California[42], Connecticut[43], Delaware[44], Florida[45], Hawaii[46], Kentucky[47], Massachusetts[48], Minnesota[49], Mississippi[50], Missouri[51], Nevada[52], New Hampshire[53], New Jersey[54], North Carolina[55], North Dakota[56], Ohio[57], Rhode Island[58], Utah[59], West Virginia[60], and Wisconsin.[61] Only Pennsylvania adheres to the **Common Enemy** rule without modification, and then only for land in urban areas.[62] The **Modified Common Enemy** Rule is used in the following twelve states and district: Alabama[63], District of Columbia[64], Washington[65], Arkansas[66], Virginia[67], Kansas[68], Indiana[69], Maine[70], Montana[71], Nebraska[72], Oklahoma[73], and South Carolina[74]. **Civil Law or Natural Flow,**

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[40] Joseph W. Dellapenna, 2 Vill. Envtl. L.J. at 287.
[41] Weinberg v. Northern Alaska Development Corp, 384 P.2d 450 (Alaska 1963).
[42] Bunch v. Coachella Valley Water District, 15 Cal. 4th 432, 442, 63 Cal. Rptr 2d 89, 94 (1997).
[43] Bielonko v. Blanchette Builders, Inc., 1999 WL 68650 (Conn. Super. Feb. 2, 1999); Page Motor Co. v. Baker, 438 A.2d 739 (Conn. 1980).
[44] Weldin Farms, Inc. v. Glassman, 414 A.2d 500 (Del. 1980); Trustees of the Village of Arden v. Unity Construction Company, 2002 WL 1271677 (Del. Ch. May 31, 2002).
[45] Westland Skating Center, Inc. v. Gus Machado Buick, Inc., 542 So.2d 959, 962 (Fla. 1989).
[46] Association of Apartment Owners of Wailea Elua v. Wailea Resort Co., 58 P.3d 608, 617 (Hawaii 2002).
[47] Klutey v. Commonwealth, Dept. of Highways, 428 S.W.2d766 (Ky. 1967); Transportation Cabinet, Bureau of Highways v. Leneave, 751 S.W.2d 36, 37 (Ky. 1988).
[48] DeSanctis v. Lynn Water and Sewer Commission, 666 N.E.2d 1292 (Mass. 1996).
[49] Kral v. Boesch, 557 N.W.2d 597 (Minn. 1996).
[50] Hall v. Wood, 443 S.2d 834, 840, n.1 (Miss. 1983); Martin v. Flanagan, 818 S.2d 1124, 1126 (Miss. 2002). .
[51] Heins Implement Co. v. Missouri Highway & Transportation Commission, 859 S.W.2d 681, 689 (Mo. 1993).
[52] County of Clark v. Powers, 611 P.2d 1072 (Nev. 1980).
[53] Dudley v. Beckley, 567 A.2d 573, 574 (N.H. 1989); Franklin v. Durgee, 51 A.911 (N.H. 1901).
[54] Sheppard v. Frankford, 617 A.2d 666, 668 (N.J. 1992).
[55] BNT Company v. Baker Precythe Dev. Co., 564 S.E.2d 891, 896 (N.C. 2002); Pendergrast v. Aiken, 236 S.E.2d 787 (1977).
[56] Burlington Northern and Santa Fe Railway Company, v. Benson County Water Resource District, 618 N.W.2d 155, 160 (N.D. 2000).
[57] McGlashan v. Spade Rockledge Terrace Condo Development Corp., 402 N.E.2d 1196 (Ohio 1980); Mays v. Moran, 1999 WL 181400 at *5 (Ohio App. 4 Dist. March 18, 1999).
[58] Zannini v. Arboretum Development, 1998 WL 1017288 (R.I. Super. July 7, 1988) (unpublished).
[59] Morgan v. Quailbrook Condominium Co., 704 P.2d 573 (Utah 1985).
[60] Graham V. Beverage, 566 S.E.2d 603, 612 (W. Va. 2002).
[61] Wisconsin v. Deetz, 224 N.W.2d 407 (Wisc. 1974); Getka v. Lader, 238 N.W.2d 87 (Wisc. 1976).
[62] Fazio v. Fegley Oil Co. , Inc., 714 A.2d 510 (Penn. 1998).
[63] Peak v. Parks, 2003 WL 21489412 (Ala. Civ. App. June 30, 2003) (although the court does not use the term Modified Common Enemy, the court requires that the plaintiff prove the defendant acted with wontonness, which is similar to the requirements of this rule); see also Wal-Mart Stores v. Langham, 794 So.2d 1170 (Ala. 2001); Easterling v. Awtrey Building Corp., 770 So.2d 606 (Ala. 1999).
[64] Ballard v. Ace Wrecking Co., 289 A.2d 888, 890 (D.C. 1971).
[65] Currens v. Sleek, 983 P.2d 626 (Wa. 1999).
[66] Michael v. Roberson, 1998 WL 712745 (Ark. App. Oct. 7, 1998).
[67] Mullins v. Greer, 311 S.E.2d 110, 112 (Va. 1984).
[68] Williamson v. Hays, 64 P.3d 364 (Kan. 2003).
[69] Romine v. Gagle, 782 N.E.2d 369 (In. 2003).
[70] Johnson v. Whitten, 384 A.2d 698 (Me 1978).
[71] Montana Dept. of Highways v. Feenan, 752 P.2d 182, 184 (Mont. 1988).

sometimes with a reasonableness requirement, is used the following fifteen states: Arizona[75], Colorado[76], Georgia[77], Idaho[78], Illinois[79], Iowa[80], Louisiana[81], Maryland[82], Michigan[83], New Mexico[84], New York[85], Oregon[86], Tennessee[87], Texas[88], and South Dakota[89] (with significant exceptions). Vermont uses nuisance language, similar to the Reasonable Use rule, but also uses trespass analysis to determine liability.[90] Wyoming has not yet adopted any of the standard rules, relying instead on negligence theories.[91]

It is important to remember that under any of the four current rules for diffused surface water, a defendant who takes no action to alter the natural state of his land or the natural flow of storm runoff is not liable, even if the natural flow of storm runoff causes damage to the plaintiff's land.[92] This principal is illustrated in a dramatic case in Mississippi

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[72] Schott v. Hennings, 2000 WL 279898 (March 14, 2000); Nu-Dwarf Farms, Inc. v. Stratbucker Farms, Ltd., 470 N.W.2d 772, 777 (Neb. 1991).
[73] Mattoon v. City of Norman, 617 P.2d 1347, 1349 (Ok. 1980).
[74] Silvester v. Spring Valley Country Club, 543 S.E.2d 563 (S.C. 2001).
[75] Gillespie Land & Irrigation Co. v. Gonzalez, 379 P.2d 135, 146 (Az. 1963) (holding that one who alters a natural watercourse will be liable for its inability to carry away waters flowing into it); see also West Maricopa Combine, Inc. v. Arizona Dept. of Water Resources, 26 P.3d 1171 (Az. 2001)(holding that landowner did not have the right to exclude others from using a riverbed to transport or store water). The courts' analysis most closely resembles the Civil Law rule.

[76] Bittersweet Farms, Inc., v. Zimbelman, 976 P.2d 326 (Colo. 1998); Hoff v. Ehrlich, 511 P.2d 523 (Colo. 1973) (finding that dominant estate has easement in lower estate for drainage of surface water; the court does not use the term Civil Law, but the rule of law is similar).
[77] McMillen Development Corp. v. Bull, 188 S.E.2d 491 (Ga. 1972); West v. CSX corp., 498 S.E.2d 67 (Ga. App. 1998).
[78] Utter v. Gibbins, 48 P.3d 1250 (Idaho 2002).
[79] Dessen v. Jones, 551 N.E.2d 782, 786 (Ill. 1990).
[80] Grace Hodgson Trust v. McClannahan, 569 N.W.2d 397 (Iowa 1997); O'Tool v. Hathaway, 461 N.W.2d 161 (Iowa 1990).
[81] Crr v. Oake Tree Apartments, 786 So.2d 230, 235 (La. 2001); Eubanks v. Bayou D'Arbonne Lake Watershed District, 742 So.2d 113, 118 (La. 1999).
[82] Mark Downs, Inc., v. McCormick Properties, Inc., 441`A.2d 1119 (Md. App. 1982)(explaining that the civil law rule, while still applicable, has been modified by a reasonableness of use qualifier) ; Sainto v. Potter, 159 A.2d 632 (Md. 1960).
[83] Kernan v. Homestead Development Co., 591 N.W.2d 369, 372 (Mich. 1998).
[84] Walker v. L.G.Everist, Inc., 701 P.2d 382 (N.M. 1985).
[85] Selter v. MCM Distributors, Inc., 299 A.2d 332, 749 N.Y.S.2d 94 (N.Y. 2002) (although the court does not use the terms Civil Law or Natural Flow, the court found the defendant liable for artificially diverting surface waters onto plaintiff's property.); see also Marzo v. Fast Trak Structures, Inc., 298 A.D.2d 909, 747 N.Y.S. 2d 637 (N.Y. 2002); Lawrence Wolf, Inc. v. Kissing Bridge Corp., 288 A.D.2d 935, 733 N.Y.S.2d 322 (N.Y. 2001).
[86] Wellman v. Kelley, 252 P.2d 816, 821 (Oregon 1953); in accord Wimmer v. Compton, 560 P.2d 626 (Oregon 1977).
[87] Zollinger v. Carter, 837 S.W.2d 613 (Tenn. 1992); Genua v. Emory Associates, 2002 WL 753214 (Ct. App. Tenn. April 26, 2002).
[88] Jefferson County Drainage District No. 6 v. Lower Neches Valley Authority, 876 S.W.2d 940 (Texas 1994).
[89] Knodel v. Kassel Township, 581 N.W.2d 504 (S.D. 1998).
[90] Canton v. Graniteville Fire District No. 4, 762 A.2d 808 (Vt. 2000).
[91] Lee v. Brown, 357 P.2d 1106, 1109 (Wyo. 1960); Tompkins v. Byrtus, 267 P.2d 753 (Wyo. 1954).
[92] See, e.g., Martin v. Flanagan, 818 S.2d 1124, 1127 (Miss. 2002).

where three people were killed and five injured in an automobile accident when ice accumulated on a road.[93] Although the defendant maintained roads on his property, it was otherwise unimproved, and therefore the court found that there was no affirmative act creating an artificial condition that could lead to liability.[94]

The required affirmative act by the defendant was evident in a Missouri case that demonstrated the devastating effects of surface water when a man drowned when his car became inoperable on a flooded highway.[95] Adjoining landowners had constructed levees that rose ten feet about the grade of the highway to protect their crops.[96] The man drove his car into the flooded section of highway, then exited his car after it stalled.[97] He suffered a cardiac arrhythmia, fell into the puddle on the highway, and drowned.[98] The court stated that life is valued over property, and in applying the reasonable use doctrine, diverting water from land to a highway may violate a reasonable duty of care.[99]

As illustrated by these cases, and others discussed below, diffused surface water can create hazardous road conditions, pollution of lakes and streams, damage to spawning habitats, flooding of homes, damage to crops, and other harm. Nonetheless, diffused surface water is also a valuable asset, critical for the recharge of aquifers on which most Americans depend for drinking water. One problem with all four rules discussed above is the failure to consider the impact of the parties' action on recharge of aquifers. In the illustration discussed earlier, where A paves his entire lot, A has prevented all precipitation from seeping through the soil, which could cause complete depletion of any underlying aquifer if A's lot is large, or if other surrounding lot owners act similarly. Notwithstanding, in the majority of jurisdictions, if A could prove he acted in good faith and benefited from the paving, A would incur no liability for his actions. It is herein suggested that courts should give significant weight to the impact of the defendant's actions on the recharge of aquifers.

1. Common Enemy Doctrine

One of the earliest cases to discuss the diversion of surface water was an 1865 Massachusetts case that held each landowner had an unlimited legal privilege to divert or deflect surface water without regard to the consequences suffered by neighbors or landowners in lower elevations.[100] This view was named the "common enemy" doctrine by a later New Jersey Court.[101] "Surface water … is regarded as an outlaw and a common enemy against which anyone may

[93] Id. at 1125.
[94] Id. at 1127.
[95] Robinson v. Missouri State Highway and Transportation Commission, 24 S.W.3d 67 (Mo. Ct. App. 2000).
[96] Id. at 71.
[97] Id.
[98] Id.
[99] Id.; see also Blake J. Pryor, "In the Wake of Heins: Break Out Your Rulers Missouri It's Time to Measure Your Levees," 66 Mo. L. Rev. 469 (2001).
[100] Gannon v. Hargadon, 92 Mass. (10 Allen) 106 (1865).
[101] Town of Union v. Durkes, 38 N.J.L. 21 (1875).

defend himself, even though by so doing injury may result to others." [102] Massachusetts later abandoned the Common Enemy doctrine in favor of the Reasonable Use rule.[103] Although the Common Enemy rule is simple in application, and avoids litigation, it encourages contests between neighbors that could lead to a breach of the peace.[104] This rule is also harmful to aquifers, permitting a landowner to divert all precipitation off his land, such as by paving the entire lot. This could prevent absorption of the precipitation into the soil, thereby causing depletion of aquifers.

Pennsylvania is one of the last states to still apply the Common Enemy doctrine, at least in urban areas. A pedestrian who slipped and fell on ice that was created by the defendant's diversion of surface water onto an adjacent public alleyway was denied recovery.[105] The court found that the Common Enemy doctrine applied in Pennsylvania urban areas, where a landowner is "liable for the effects of surface water running off his or her property only where he either (a) diverted the water from its natural channel by artificial means, or (b) unreasonably or unnecessarily increased the quantity or changed the quality of water discharged from his property."[106] Although the defendant had covered his property with macadam, thereby causing the runoff to flow into the alley, the court found this was not an artificial condition because there was no evidence that the grade of the land had changed.[107] The court ignores the fact that the water would likely have been absorbed into the soil had not the artifical coverage of macadam been added by the defendant.

2. Modified Common Enemy

Nearly every jurisdiction that still follows the Common Enemy rule has adopted some exceptions or limitations to it. A recent Washington court[108] recognized three usual exceptions:

A. Landowners may block the flow of diffused surface water, but are prohibited from inhibiting the flow of a watercourse or natural drainway.[109]

B. Landowners are prohibited from collecting water and channeling it onto land of a lower elevation or their neighbor's land.[110]

C. Landowners who block the flow of diffused surface water must exercise due care or act reasonably, or in good faith, or with such care as to avoid unnecessary damage to the property of others.[111]

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[102] Currens v. Sleek, 983 P.2d 626, 628 (Wa. 1999), quoting Cass v. Dicks, 44 P. 113, 113 (1896).
[103] See Tucker v. Badoian, 384 N.E.2d 1195 (Mass. 1978); DeSanctis v. Lynn Water and Sewer Commission, 666 N.E.2d 1292 (Mass. 1996).
[104] Diffused Surface Water: Scourge or Boounty, 8 Nat. Resources J. 73, 78 (1968).
[105] Fazio v. Fegley Oil Co., Inc., 714 A.2d 510 (Penn. 1998).
[106] Id. at 513.
[107] Id. at 514.
[108] Currens v. Sleek, 983 P.2d 626 (Wa. 1999)
[109] Id. at 629.
[110] Id.
[111] Id.; in accord, Ballard v. Ace Wrecking Co., 289 A.2d 888, 890 (D.C. 1971).

The Washington court refused to abandon the Common Enemy doctrine, but adopted the third exception, holding "landowners who alter the flow of surface water on their property must exercise their rights with due care by acting in good faith and by avoiding unnecessary damage to the property of others."[112]

Arkansas also follows the Modified Common Enemy approach, finding that the right to divert surface water must be exercised with "due care so as not to inflect injury on a neighboring landowner beyond what may be fairly necessary."[113] The court required the defendant to remove fill dirt and shrubbery that obstructed the drainage, causing pooling of water on the plaintiff's property.[114] An earlier Arkansas court similarly required the removal of an obstruction to drainage.[115]

Virginia courts also follow the Modified Common Enemy approach, defining the rule as, "surface water is a common enemy, and each landowner may fight it off as best he can, provided he does so reasonably and in good faith and not wantonly, unnecessarily, or carelessly."[116] In a 1984 case, the court ordered a defendant to remove a 125 foot long embankment that diverted surface water from a natural channel.[117] The defendant constructed his home in the natural drainage area and the court found his actions to be unreasonable.[118] A 1975 Virginia court applying the same rule found no liability where the defendant erected a drainage system to channel water around his buildings, because the defendant did not act negligently, carelessly, or with malice, despite the three to eight inches of standing water left on plaintiff's property.[119] The difficulty in predicting results is obvious in these decisions, where the Virginia defendant in the 1975 case was not liable, but the 1984 Virginia defendant and the Arkansas defendant were liable.

A recent Kansas court found no liability where a subdivision storm sewer system dumped water on the plaintiff's property at a higher velocity and increased flow.[120] The court rejected the claim of negligence, finding that the storm sewer system was constructed according to prevailing standards.[121] The court also rejected the plaintiff's claim of trespass, finding no evidence of pollution or evidence that the water changed its "ordinary and regular

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[112] 983 P.2d at 630
[113] Michael v. Roberson, 1998 WL 712745 (Ark. App. Oct. 7, 1998) (quoting Pirtle v. Opco, Inc., 601 S.W.2d 265 (Ark. 1980).
[114] 1998 WL 712745 at *1,2.
[115] Pirtle v. Opco, Inc., 601 S.W.2d 265 (Ark. 1980).
[116] Mullins v. Greer, 311 S.E.2d 110,112 (Va. 1984) (quoting McCauley v. Phillips, 219 S.E.2d 854, 858 (Va. 1975)).
[117] 311 S.E.2d at 111.
[118] Id.
[119] McCauley v. Phillips, 219 S.E.2d 854 (Va. 1975).
[120] Williamson v. Hays, 64 P.3d 364 (Kan. 2003).
[121] Id. at 372.

course."[122] Because the water followed its normal course through the plaintiff's property, the increased velocity and volume of the water was not actionable by the plaintiff.[123]

An Indiana court awarded punitive and compensatory damages, as well as required the defendant to remove an obstruction, after the defendants filled a ditch with dirt.[124] The court acknowledged that the Common Enemy doctrine would allow the defendants to divert or dam surface water, but found that the water in question flowed through a natural watercourse.[125] The court defined "natural watercourse" as "one through which water regularly, though not constantly, flows along and through an identifiable and more or less permanent course, which includes among its features a bed where a natural stream of water runs."[126] Because the water flowed in a channel across the parties' properties, the Common Enemy doctrine did not protect the defendants.[127] The facts of this case are similar to the Arkansas case, with a similar result.[128]

In another case discussing the natural water course exception, a more recent Federal District Court applying Indiana law denied summary judgment to Wal-Mart, indicating that a factual issue had been raised as to whether the Common Enemy rule should apply where Wal-Mart had placed fill dirt and construction materials in a creek floodway.[129] If the water causing the flooding was determined to be diffused surface water, then the Common Enemy doctrine would protect Wal-Mart.[130] If, however, the water was determined to be a natural watercourse, a lower landowner cannot obstruct the watercourse to the detriment of the upper landowner.[131] It is this type of conundrum that suggest a more unified approach to all water issues is necessary.

As the foregoing cases illustrate, it is difficult to predict when a court will determine that a defendant has been unreasonable or acted in bad faith. The difference between natural watercourse and diffused surface water is not always clear. The court's analysis of the necessity of the harm to the plaintiff is not easy to predict. Also, courts fail to consider the extent of the impact on aquifer recharge caused by diversion of surface water in applying this rule. Notwithstanding these issues, the Modified Common Enemy rule remains more predictable than the Reasonable Use rule, as currently applied by courts.

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[122] Id. at 371.
[123] Id. at 372.
[124] Romine v. Gagle, 782 N.E.2d 369 (In. 2003).
[125] Id. at 381.
[126] Id.
[127] Id.
[128] Michael, 1998 WL 712745.
[129] Heath v. Wal-Mart Stores, Inc., 113 F. Supp. 2d 1294 (S.D. Ind. 2000).
[130] Id. at 1301.
[131] Idd.

3. Civil Law or Natural Flow Rule

Louisiana first adopted the natural flow doctrine, holding that the owner of land at lower elevations must accept the surface water that naturally flows onto his property, but the owner of higher elevations may do nothing to increase the flow.[132] "A person who interferes with the natural flow of surface water so as to cause an invasion of another's interests in the use and enjoyment of his land is subject to liability to the others."[133] Some courts used easement language, finding that landowners at higher elevations had an easement to discharge water on the lower elevations.[134] Most courts add a limitation that the defendant must act with reasonable care.[135]

A New York court used classic Natural Flow analysis in granting summary judgment to a plaintiff where the record indicated that the defendants had "artificially diverted surface waters onto the plaintiffs' property."[136] The one-page opinion has no discussion of reasonableness or balancing of burdens.

Similar to the New York court, a Tennessee court did not discuss whether the clearing by defendants' was reasonably necessary or was significantly beneficial to defendants. The Court affirmed a jury award of $25,000 plus an injunction against defendants who cleared land of trees and other vegetation to develop a residential subdivision.[137] The changes to defendants' land caused flooding and damage to plaintiff's home, located at a lower elevation.[138] There was no balancing of the benefits, unlike the Illinois case discussed below[139], and no reasonable care requirement, as in the Idaho case below.[140]

Idaho continues to follow the traditional civil law rule, finding "a servitude for natural drainage exists between adjoining landowners."[141] An Idaho court added a duty of reasonable care when the upper landowner operated a dam to divert water from its natural course into an artificial channel.[142] The court considered the purposes for which the artificial channel and dam were created, as well as the property's use for recreation, fish and wildlife, flood control, and power generation.[143]

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[132] Orleans Navigation Company v. City of New Orleans, 2 Mart. 214 (La. 1812).
[133] Butler v. Bruno, 341 A. 2d at 738, quoting Kinyon & McClure, Interferences with Surface Waters, 24 Minn. L. Rev. 891 (1940).
[134] Dessen v. Jones, 551 N.E.2d 782 (Ill. 1990); Nininger v. Norwood, 72 Ala. 277, 282-83, 47 Am. Rep. 412 (1882); see also Stanley v. Kinyon and Robert C. McClure, "Interferences with Surfaced Waters," 24 Minn. L. Rev. 891, 894 (1940).
[135] Burgess v. Salmon River Canal Company, 805 P.2d 1223, 1229 (Idaho 1991).
[136] Selter v. MCM Distributors, Inc., 299 A.D.2d 332, 749 N.Y.S.2d 94 (2002).
[137] Genua v. Emory Associates, 2002 WL 753214 (Tenn. Ct. App. April 26, 2002.)
[138] Id. at *2.
[139] Dessen v. Jones, 551 N.E.2d 782, 786 (Ill. 1990).
[140] Utter v. Gibbins, 48 P.3d 1250 (Idaho 2002).
[141] Utter v. Gibbins, 48 P.3d 1250 (Idaho 2002).
[142] Burgess v. Salmon River Canal Company, Ltd., 805 P.2d 1223, 1229 (Idaho 1991).
[143] Id. at 1230.

Illinios also claims to use the Civil Law rule, with two exceptions: (1) "the good husbandry rule… permits the owner of dominant agricultural land to increase or alter the flow of water upon a servient estate if this is required for proper husbandry of the dominant land;[144]" and (2) an exception that pertains only to railroads.[145] In addition to these two exceptions, there is a reasonable use qualification, where the dominant estate has increased the drainage on the servient estate, permitting "those defendants to change the drainage if the advantage to the dominant land sufficiently outweighed the damage to the use of the servient land."[146] In balancing these advantages, the court should consider "(1) the extent and nature of the harm; (2) the social value attached to the type of use or enjoyment interfered with; (3) the suitability of the particular use or enjoyment involved; (4) the burden on those harmed of avoiding harm; (5) the usefulness of the improvement to the street."[147] These qualifications cause difficulty in distinguishing the modified Civil Law rule from the Reasonable Use rule. This qualification does not apply where the servient estate has obstructed the drainage flow from the dominant estate, where the traditional civil law rule applies, making the servient owner liable for blocking the drainage.[148]

The benefit of the traditional Civil Law rule is that aquifers can be recharged without interference from artificial drainage systems, and the potential liability may cause landowners to avoid excess paving and other impervious covering of the land. This rule is more predictable in application, but may result in a breach of the peace. The classic Civil Law rule, as applied in New York and Tennessee, is simple in application and protects aquifers. The modifications added by Idaho and Illinois make the rule less predictable in application, and result in greater impact on recharge of aquifers.

4. Reasonable Use Rule

Twenty- one states now follow the Reasonable Use rule, which requires that a property owner who diverts or block surface water must act reasonably, which is a fact to be determined by a jury.[149] The jury must also balance the harm to the plaintiff's land caused by the altered flow of surface water with the utility of the defendant's use of his land.[150] This balancing test is not required where the defendant is a municipality, because the municipality is "always free to limit its costs by acquiring drainage or other easements through exercise of the power of eminent domain."[151]

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[144] Dessen v. Jones, 551 N.E.2d 782, 786 (Ill. 1990).
[145] Coomer v. Chicago & North Western Transportation Co., 414 N.E.2d 865 (Ill. 1980).
[146] Dessen, 551 N.E.2d at 786.
[147] Id. at 787.
[148] Id. at 789; in accord, Mileur v. McBride, 498 N.E.2d 581 (Ill. 1986).
[149] Butler v. Bruno, 341 A.2d at 739.
[150] DeSanctis v. Lynn Water and Sewer Commission, 666 N.E.2d 1292, 1296 (Ma. 1996).
[151] Schleissner v. Provincetown, 538 N.E.2d 995, 997 (Ma. 1989).

The trend toward the Reasonable Use rule is recent; as of 1940, only two states, New Hampshire and Minnesota, had adopted this rule, according to the seminal article on the subject by Kinyon and McClure.[152] This trend may be due in part to the Kinyon and McClure article, which advocated for the Reasonable Use rule.[153] Some courts acknowledge the lack of predictability in this rule, but find it encourages the development of land.[154]

This rule differs from the Modified Common Enemy rule, because the Modified Common Enemy rule requires some degree of negligence, malice, or lack of good faith for liability.[155] The Reasonable Use rule focuses on the results of the defendant's actions and the interference caused thereby with the plaintiff's use of his land.[156] The Reasonable Use rule uses analysis similar to a tort action in nuisance.[157] The negligence of the defendant is not relevant, but rather unreasonable use by the defendant.[158] The factors to be considered by courts applying this rule include the following, as first set forth in the Minnesota case of *Enderson v. Kelehan*:

"a. Is there a reasonable necessity for such draining?
b. Has reasonable care been taken to avoid unnecessary injury to the land receiving the water?
c. Does the benefit accruing to the land drained reasonably outweigh the resulting harm?
d. When practicable, is the diversion accomplished by reasonably improving the normal and natural system of draining, or if such a procedure is not practicable, has a reasonable and feasible artificial draining system been installed?"[159]

Professor Joseph W. Dellapenna, in his excellent 1991 article[160], suggests that courts have considered eleven factors to determine whether an alteration of natural drainage was reasonable:

"(1) The injury to neighboring lands;
(2) The benefit to the drained land;
(3) The burden on either party of ameliorating the injury;
(4) The extent of the change to the drainage system;
(5) The necessity for changing the drainage system;
(6) The motive for changing the drainage system;

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[152] Stanley v. Kinyon and Robert C. McClure, "Interferences with Surfaced Waters," 24 Minn. L. Rev. 891, 894 (1940).
[153] Id at 935-939.
[154] Weldin Farms, Inc. v. Glassman, 414 A.2d 500, 505 (Del. 1980).
[155] Butler, 341 A.2d at 740.
[156] Id.
[157] Id.
[158] DeSanctis, 666 N.E.2d at 1296.
[159] Butler, 341 A.2d at 740, citing Enderson v. Kelehan, 32 N.W.2d 286 (Minn. 1948). In accord, Clark v. Powers, 611 P.2d 1072, 1075 (Nev. 1980).
[160] Joseph W. Dellapenna, "The Legal Regulation of Diffused Surface Water," 2 Vill. Envtl. L. J. 285, 316-318 (1991).

(7) The foreseeability of impact on neighboring lands;
(8) Justice and other social values;
(9) The location of the lands;
(10) The extent and intended effect of any public authorization;
(11) The protection of existing values."[161]

Unfortunately, none of the above factors considers the impact that diversion of surface water has on recharge of aquifers. Without consideration of aquifer recharge, we are endangering the drinking water supply of this nation. If all courts used the same rule and factors, consistency and predictability would be enhanced. Few of the courts that currently apply the Reasonable Use rule use either group of factors noted above.

Alaska follows the Reasonable Use rule, but made no attempt to analyze the factors listed above.[162] The court stated that the reasonableness of the defendant's actions must be determined by the trial judge.[163]

Delaware courts have developed a different set of factors to be considered in applying the Reasonable Use rule: "the amount of harm caused, the foreseeability of such harm, the utility of the upland owners' use of their land as contrasted with the degree of harm resulting from such use, and whether the upland owners' conduct is unreasonable, reckless, or negligent."[164]

California claims to use a modified version of the Civil Law rule, requiring that each property owner must leave the natural flow of surface water undisturbed; however the modifications make the rule the same as the Reasonable Use rule.[165] A recent California court noted that the Civil Law rule has the advantage of predictability, but then went on to say, "we cannot permit certainty of liability to be an excuse for tolerating unreasonable conduct by any landowners."[166] The court determined the reasonableness of the conduct by weighing the utility of the defendant's use with the gravity of the harm to the plaintiff, and decided that if the harm to the plaintiff was unreasonably severe, then the defendant must be liable.[167] This court has added a significant level of unpredictability to California water law.

Minnesota and Kentucky courts have adopted the reasonable use rule, as well as the four *Enderson* factors.[168] The Kentucky court relied heavily on nuisance

[161] Id. at 316-318 (citations omitted).
[162] Weinberg v. Northern Alaska Dev. Corp., 384 P.2d 450 (Alaska 1963).
[163] Id. at 452.
[164] Trustees of the Village of Arden v. Unity Construction Co., 2002 WL 1271677 at *4 (Del. Ch. May 31, 2002).
[165] Gdowski v. Louie, 84 Cal. App. 4th 1395, 1402, 101 Cal. Rptr. 2d 609, 614 (2000).
[166] Id. at 1403, 614.
[167] Id.
[168] Klutey v. Kentucky, Dept. of Highways, 428 S.W.2d 766, 770 (Ky. 1967); Kral v. Boesch, 557 N.W.2d 597 (Minn. 1996); see also Pulkrabek v. Novacek, 2001 WL 50886 (Minn. App. Jan. 23, 2001).

anaysis, balancing the reasonableness of the defendant's use of his property with the extent of harm to the plaintiff's property.[169] A dissent noted the confusion and consternation caused by the change from the well- settled Civil Law doctrine to the Reasonable Use test.[170]

A Mississippi decision is unusual because of the court's sensitivity to ecological and environmental impact.[171] The defendant had stripped off all vegetation in preparation of selling the property to a department store.[172] The deal fell through, and the defendant left the stripped parcel as is, without erosion prevention.[173] Eighty to one hundred tons of silt, sediment, and other pollutants were washed into a nearby lake per year, creating a mud bar and destroying spawning habitat. [174] The court found that the defendant did not do what was reasonable to minimize the foreseeable damage, and therefore issued an injunction requiring the defendant to remove all silt and prevent further pollution of the lake.[175]

Missouri courts have followed the Restatement (Second) of Torts, § 833 (1977) suggestion that interfering with the flow of surface water is to be analyzed as a form of nuisance.[176] The court found a cause of action was stated by plaintiffs whose land was flooded repeatedly after a highway bypass project was completed with a culvert that was designed to divert only normal flow, not common overflows.[177] A more recent Missouri court found that a nuisance claim was stated, where the plaintiff claimed that the towns had negligently designed storm drainage and sewer systems that caused repeated flooding of their downhill property. [178] The court found that common law actions of negligence and trespass were made obsolete by the Reasonable Use rule, which requires that nuisance be proven, and remanded the case for such a determination.[179]

A New Jersey court illustrated the lack of predictability in outcome by finding that hurricanes are reasonably foreseeable, enjoining a town from the continuing nuisance of an eighteen inch outfall pipe releasing water onto a ditch on plaintiff's property.[180] The pipe drained an area of forty eight to one

[169] Id.
[170] Id. at 771 (Osborne, J., dissenting).
[171] Hall v. Wood, 443 S.2d 834 (Miss. 1983).
[172] Id. at 837.
[173] Id.
[174] Id.
[175] Id. at 841.
[176] Heins Implement Co. v. Missouri Highway & Transportation Commission, 859 S.W.2d 681, 689 (Mo. 1993).
[177] 859 S.W.2d at 684.
[178] Thomas v. Kansas City, 92 S.W.3d 92 (Mo. 2002).
[179] Id. at 98.
[180] Sheppard v. Frankford, 617 A.2d 666, 668 (N.J. 1992).

hundred acres, including three hundred feet of pipe.[181] The court mentioned no factors in concluding the impact was unreasonable.

Ohio courts use a different set of factors to determine reasonable use, partially adopted from the Restatement Second of Torts: (1) the foreseeability and gravity of plaintiff's harm; (2) the utility of defendant's development; and (3) the practicality of preventing the harm to the plaintiff.[182]

A Rhode Island plaintiff was successful in obtaining an order requiring the defendant condominium developer to construct a more effective drainage system.[183] The court adopted the four *Enderson* factors listed above in applying the reasonable use rule.[184] The plaintiff suffered water in his basement, cracked cement walkways, and stains and mold on basement walls.[185] The Defendant had constructed a street and a duplex condominium project with only a timber wall to halt the drainage from roofs and pavement.[186] Prior to the defendant's alterations, the runoff directed at plaintiff's property was an average of 35% of the post alteration runoff, and when the surface was frozen, the pre-alteration flow was 25% less.[187] The court found that the plaintiff should have either made a reasonable improvement to the natural drainage system or installed an artificial system to avoid liability.[188] The court found the defendant's actions to be a nuisance, and awarded both injunctive relief and compensatory damages.[189]

In another case the illustrates the lack of predictability and general unfairness of the Reasonable Use rule, a Massachusetts court found that the defendant, a municipal water commission, was not liable, even though a jury found it to be negligent, in flooding the plaintiff's land.[190] The Defendant would only be liable if its interference with the flow of surface waters was found by a jury to be unreasonable.[191] The defendant escaped liability when the jury found they were negligent but that their use was not unreasonable.[192]

In one of the few areas where West Virginia law differs from Virginia law, West Virginia follows the reasonable use rule.[193] A West Virginia Court denied summary judgment to the defendant, finding that a jury must determine whether the drainage system for the defendant's new housing development,

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[181] Id. at 667-668.
[182] McGlashan v. Spade Rockledge Terrace Condo Dev. Corp., 402 N.E.2d 1196, 1201 (Ohio 1980).
[183] Zannini v. Arboretum Development, 1988 WL 1017288 (R.I. Super. July 7, 1988) (unpublished).
[184] Id. at *2, n. 1.
[185] Id. at *1.
[186] Id. at *1.
[187] Id.
[188] Id. at *3.
[189] Id. at *4.
[190] DeSanctis v. Lynn Water and Sewer Commission, 666 N.E.2d 1292 (Mass. 1996).
[191] Id. at 1296.
[192] Id. at 1296.
[193] Graham v. Beverage, 566 S.E.2d 603, 612 (W.Va. 2002).

which drained the runoff from two acres of land on to plaintiff's property, was reasonable.[194]

IV. Problems with the Reasonable Use Standard

The most commonly stated problems with the Reasonable Use rule are the lack of certainty and predictability.[195] Because states apply such different standards, and there is no consistency even within jurisdictions as to how the factors are weighed and balanced, landowners cannot predict how a court will decide. As discussed above, a defendant who is negligent may not be liable in Massachusetts[196], and a defendant may be required to predict the effects of hurricanes in New Jersey.[197]

Some courts have stated that the reasonable exception to the Modified Common Enemy rule and the Reasonable Use rule are identical in application; "the so-called exception … devour[s] the rule."[198] A Missouri Court referred to it as a "distinction without a difference."[199] These courts have failed to distinguish the different focus, where the Modified Common Enemy rule imposes liability for negligence by the defendant while the Reasonable Use rule imposes liability if the action results in a nuisance. This failure highlights the problem with the multiple rules and difficulty in prediction of outcome.

A more important problem with the Reasonable Use rule is the failure to consider the impact of diversion of surface water on aquifer recharge. Among the various factors considered by courts, no court has considered whether the defendant's property is located in a watershed, or the impact of the defendant's actions on the recharge of the aquifer. Landowners in an aquifer recharge area should be held to a higher standard, prohibited from diverting surface waters in such a way that inhibits recharge of the aquifer. Courts should consider the impact of paving or impervious cover, which not only increases the flow of surface water, thereby increasing the potential harm to other property, but prohibits aquifer recharge.[200]

V. Environmental Impact

Alterations to the surface, grade, irrigation, or vegetation of land, or construction of improvements, all impact the storm runoff, and thereby affect the quantity and quality of recharge of aquifers. Merely tilling the land changes "the infiltration and runoff characteristics of the land surface, which affects recharge to groundwater, delivery of water and sediment to surface-water bodies, and evapotranspiration."[201] Surface water, the result of rain or snow, is directly related to the quantity and quality of

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[194] Graham v. Beverage, 566 S.E.2d 603 (W.Va. 2002).
[195] Id. at 632, (Sanders, J. dissenting)
[196] DeSanctis v. Lynn Water and Sewer Commission, 666 N.E.2d 1292 (Mass. 1996).
[197] Sheppard v. Frankford, 617 A.2d 666, 668 (N.J. 1992).
[198] Graham v. Beverage, 566 S.E.2d 603 (W.Va. 2002)(Sanders, J. dissenting).
[199] Heins, 859 S.W.2d at 690.
[200] See, e.g., Fazio v. Fegley Oil Co., 714 A.2d 510 (Penn. 1998).
[201] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Effects of Human Activities on the Interaction of Ground Water and Surface Water," at p. 1, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003.

groundwater aquifers; the two water sources should not be treated as separate assets by the law.

Aquifer water quality is affected by development of surface water property. Drinking water aquifers become contaminated by ammonium, a major component of fertilizer and manure, which dissolves in the precipitation and enters the groundwater.[202] In more urban areas, sewage treatment plants, industrial facilities, septic tanks, and stormwater drains carry contaminants through the surface water to aquifers.[203] More rapid drainage caused by artificial drainage systems results in less time in contact with deep subsurface materials, which reduces the buffering of acid precipitation, resulting in higher acidity in lakes and streams.[204] Lowering the level of water in aquifers caused by development can result in salt water intrusion near the coast, where sea water moves into the aquifer or rises up from the bottom of the aquifer and contaminates the fresh water.[205]

The layers of soil and gravel through which the surface water and precipitation must pass were once thought to act as filters to protect the purity of the water reaching the aquifer.[206] It has now become painfully obvious that impurities pass through this filtration: in 1990 the U.S. Environmental Protection Agency reported "[b]etween 1971 and 1985, ground-water related disease outbreaks, with 52,181 associated illnesses, were reported…. About 10 percent of all ground-water public water supply systems are in violation of drinking water standards for biological contamination. In addition, approximately 74 pesticides, a number of which are known carcinogens, have been detected in the ground water of 38 states."[207]

The quantity of aquifer recharge is also affected by development. Before land is used for agriculture or construction, excess water is often drained from the land.[208] In Iowa, more than 90 percent of the original wetland areas have been destroyed in this manner; in the upper Midwest, nearly 50 percent have been destroyed.[209] These changes impact the amount of surface water available to recharge aquifers.[210]

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[202] Id. at 4.
[203] Id.; "Land use control in the recharge area is the way to keep the water clean in the well field. If you don't protect that well field, what they spill on Interstate 75 on Monday will be in your coffee on Tuesday, coming right through that spigot." Debra Raines Ward, "Water Wars", at 218.
[204] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Effects of Human Activities on the Interaction of Ground Water and Surface Water," at p. 7, Box S, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003.
[205] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 42, 43, http://www.swfwmd.state.fl.us last visited July 9, 2003.

[206] United States Environmental Protection Agency, Office of Water, "Citizen's Guide to Ground-Water Protection, EPA 440/6-90-004, at 3, April, 1990.
[207] Id.
[208] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Effects of Human Activities on the Interaction of Ground Water and Surface Water," at p. 5, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003
[209] Id.
[210] Id. at 5.

Construction of improvements and paving land necessitates construction of drainage systems to carry off the storm water that is no longer able to seep into the soil. "More efficient runoff caused by drainage systems results in decreased recharge to ground water and greater contribution to flooding."[211] Removing vegetation also increases storm runoff and soil erosion, thereby decreasing infiltration to ground water.[212] Statistics proving the measured impact on aquifers when acres of land are covered with paving or buildings are not available. The exact quantity of recharge from streams fed by precipitation "remains highly uncertain," although "promising new methods of estimating ground-water recharge…are being developed."[213] Because we are unable at this time to measure the damage to aquifers caused by development, we must be cautious to ensure that irreversible damage is prevented.

Global warming may also negatively impact the quantity and quality of groundwater aquifers, but "little attention has been directed at determining the effects of climate change" and the effects on the hydrologic cycle "can only be described with great uncertainty."[214] Because of the uncertainty of impact, it is imperative that we take reasonable steps to protect aquifers now before global warming exacerbates the problem.[215]

VI. Problems with Local Ordinances

Because there is no comprehensive federal legislation of aquifer use, control of aquifers is primarily controlled by local town ordinances.[216] Numerous federal laws are intended to protect the quality of the groundwater, but none address the

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[211] Id. at 5.

[212] Id. at 7 "Some of the important functions of riparian vegetation and riparian wetlands include preservation of aquatic habitat, protection of the land from erosion, flood mitigation, and maintenance of water quality. Destruction of riparian vegetation and wetlands removes the benefits of erosion control and flood mitigation, while altering aquatic habitat and chemical processes that maintain water quality"; see also Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 42, http://www.swfwmd.state.fl.us last visited July 9, 2003; Hall v. Wood, 443 S.2d 834 (Miss. 1983).

[213] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Natural Processes of Ground-Water and Surface-Water Interaction," at p. 23, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003. see also U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Challenges and Opportunities" at p. 2, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003 "The need to understand better how development of one water resource affects the other is universal and will surely increase as development intensifies."

[214] U.S. Department of the Interior, U.S. Geological Survey, Circular 1139, "Effects of Human Activities on the Interaction of Ground Water and Surface Water," at p. 8, July 9, 2001, http://water.usgs.gov/pubs/circ/1995/circ1139/htdocs/boxp.htm, last visited July 2, 2003

[215] "The Intergovernmental Panel on Climate Change… an independent UN-sponsored scientific body of 119 members from 32 countries, has stated in a series of reports released in 1995, 1997, and 2001, that in the next hundred years the planet will have warmed between 3 degrees and 6 degrees Celsius…. Water supply will be profoundly altered. In a warming world, water will be sucked out of the soil at elevated evaporation rates." Diane Raines Ward, "Water Wars" at 18-19.

[216] The use of rivers, lakes, and other bodies of water that cross states lines is often controlled by contracts or Compacts between the states, such as the Colorodo River Compact, which apportions the share of each bordering state. See Diane Raines Ward, "Water Wars" at 67. The implications of these Compacts is beyond the scope of this article.

quantity.[217] Some towns designate the aquifer recharge area, or watershed, and impose additional restrictions on these areas, however the determination of the exact location of the watershed is not an exact science. Town ordinances are inconsistent, and many are not effective at ensuring that precipitation is allowed to recharge aquifers. For example, one of the better aquifer conservation district ordinances was enacted by the Town of Sanbornton, New Hampshire in 1978.[218] The ordinance provides that "no more than 10 percent of a lot or tract shall be covered with pavement, roofing, or other material impervious to water." The lot size minimum is six acres.

In contrast, the Falmouth, Massachusetts, Water Resource Protection District ordinance[219] provides a minimum lot size of only 80,000 square feet and permits lot coverage of up to 20% for residential uses and 40% for non-residential uses. The aquifer protection district ordinances for the towns of Hadley, Massachusetts[220], Bedford, New York[221], and Richmond, Rhode Island[222] do not contain minimum lot sizes, have no lot coverage maximum percentages, and permit commercial uses. Most of the local zoning ordinances reviewed made an attempt to protect the water quality, by limiting septic disposal and use of hazardous materials, but were inadequate to regulate the quantity of surface water available to recharge the aquifer.

Instead of depending on each town to impose effective ordinances to protect aquifers, a more unified approach is needed. Courts should impose a single standard for diffused surface water, rather than the four different standards discussed above. Additionally, courts should consider the impact on aquifers as an important factor in determining liability of defendants for diverting surface water. These changes would be an important first step toward protecting the quantity of available aquifer drinking water. Federal legislation regulating the use of aquifer water would be a logical next step.

VII. Suggested Standards to be Used for Reasonable Use

Courts should adopt standard factors to be considered when applying the Reasonable Use rule, or any of the other rules for diffused surface water. Water does not respect state borders, therefore inconsistent rules for adjoining states makes no sense. The following are suggested factors that would increase predictability and protect the nations' aquifers. Defendants should be liable for diversion of diffused surface water unless:

(1) No more than 10% of the defendant's lot is covered with impervious cover, including structures or paving.

[217] United States Environmental Protection Agency, Office of Water, "Citizen's Guide to Ground-Water Protection, EPA 440/6-90-004, at 8, April, 1990.
[218] "Aquifer Conservation District Ordinance of the Town of Sanbornton, New Hampshire, (1978).
[219] Town of Falmouth "Article IV. Overlay Regulations, Water Resource Protection Districts," section 4123
[220] Town of Hadley, Massachusetts, Section xii "The Aquifer Protection District" adopted March 1985.
[221] Town of Bedford, New York, Section 125-29.3. Aquifer Protection Zone, adopted January 28, 1986.
[222] Town of Richmond, Rhode Island, Chapter 18.37 Aquifer Protection District, section 18.37.010 – 18.37.050, adopted 1984.

(2) Any artificial drainage system diverts precipitation towards a natural watercourse or an area with sufficient vegetation to allow absorption by the soil;
(3) The diversion of surface water does not impair the total amount of water available to recharge the nearest aquifer;
(4) Any increase in quantity or velocity of water draining on adjoining or lower elevation properties as a result of the defendant's diversion causes no foreseeable harm to people, structures or crops, considering a 20 year flood.

The factors above do not take into account the need to encourage development of real estate. Development is its own reward, and is no longer a primary goal in most communities, which are now more concerned with preserving their remaining undeveloped land. The protection of the water supply is another reason for communities to preserve such undeveloped land.

VIII. Suggested Legislation to Protect Aquifers

It has been suggested that federal legislation should regulate the management of aquifers.[223] The author supports this suggestion. Many of the nation's largest aquifers cross state lines, making state laws ineffective for management. Some states are more ecologically aware than others, and a consistent and comprehensive plan is necessary to protect these valuable assets. Aquifer management must include management of diversion of diffused surface water. The hydrologic cycle dictates that precipitation the collects as diffused surface water will eventually end up in an aquifer; the interrelationship between these water sources necessitates that comprehensive management consider all forms of water, rather than the current separate legal treatment of diffused surface water, groundwater, and riparian rights.[224]

Florida has more comprehensive water legislation than most states, because Florida has more ground water in aquifers than any other state.[225] The 1972 Florida Water Resources Act,[226] established five water management districts which were assigned the responsibility for water management, including quantity, quality, and flood protection.[227] Prior to the enactment of this legislation, areas of Florida were experiencing saltwater intrusion, diminished spring flow, dried out marshes, and disappearing lakes, caused by withdrawing more groundwater from aquifers than

[223] Benjamin R. Vance, "Total Aquifer Management: A New Approach to Groundwater Protection," 30 U.S.F.L. Rev. 803, 804 (1996)
[224] See 5 "Waters and Water Rights" §59.01, The Michie Company, 1991
[225] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 49, http://www.swfwmd.state.fl.us last visited July 9, 2003.

[226] F.S.A. § 373 et. Seq. (2003).
[227] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 10, http://www.swfwmd.state.fl.us last visited July 9, 2003.

could be recharged by precipitation.[228] Central Florida was plagued with sink holes caused by reductions in the water table.[229]

The Floridan Aquifer, which underlies all of Florida and parts of Alabama, Georgia, and South Carolina, has experienced increased pumping in recent decades resulting in lower water levels.[230] Nearly 700 sinkholes appeared in 1998 when the earth above the aquifer collapsed from the loss of water.[231] Water levels in the Hawthorn and Sandstone aquifers declined by about one foot per year between 1974 and 1998.[232] "Saltwater contamination has been observed in all of the principal water-supply aquifers of southern Florida."[233] The state now acknowledges that "[l]imiting intensive development in high recharge areas is critical for maintaining water supplies; water cannot soak through pavement."[234] The water management districts have also established a program of water conservation, resulting in a seven percent decrease of groundwater withdrawals between 1990 and 1995, even though the population increased nine percent. [235] The management in place in Florida should be used as an example for other states, and the federal legislators, in managing aquifers.

IX. Conclusion

The existence of four different standards to impose liability for diversion of diffused surface water is burdensome, creates confusion and a lack of certainty and predictability, and is fundamentally unfair. These four standards are also ineffective in protecting the recharge of aquifers. A single standard should be adopted by all courts, with a significant amount of weight given to the impact of the defendant's actions on the recharge of aquifers.

Comprehensive federal legislation is needed to protect aquifers. Zoning ordinances, subdivision ordinances, site plan review, design standards, operating standards, source prohibitions, land sales, public education, groundwater monitoring, household hazardous waste collection, and water conservation are all necessary tools to manage and protect the supply of adequate and clean drinking water. Clean drinking water is no longer an abundant renewable resource and must be preserved and protected.

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[228] Id. at 14.
[229] Id. at 30.
[230] Id. at 54.
[231] Id. at 55.
[232] Scott Prinos, A.C. Lietz, and R.B. Irvin, "Desing of a Real-Time Ground-Water Level Monitoring Network and Portrayal of Hydologic Data in Southern Florida," U.S. Geological Survey WRIR 01-4275, http://sss.sflorida.er.usgs.gov/ddn_data/project/Water_use_precip.html, last visited July 10, 2003.
[233] Id. at *2.
[234] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 54-55, http://www.swfwmd.state.fl.us last visited July 9, 2003.
[235] Elizabeth D. Purdum, "Florida Waters; A Water Resource Manual from Florida's Water Management Districts," at 79, http://www.swfwmd.state.fl.us last visited July 9, 2003.