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Runoff and Reality: Externalities, Economics, and Traceability Issues in Urban Runoff Regulation

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I. INTRODUCTION

If you sneeze, have you polluted? If you smoke in public, have you polluted? If you wash your car in your driveway, have you polluted? If you fertilize your lawn, have you polluted? If you pull out the chainsaw and take down a tree, have you polluted? If you run a business that uses chemicals on land-based resources, like a coal processing facility, have you polluted? What are your legal responsibilities if you take any of these actions? Do you know, have you considered it, and do you care? All of the above activities can cause trans-boundary effects—that is, effects beyond yourself or beyond your property—and much of the harm that these activities can cause is not immediately apparent. It is easy to ignore the incidental effects of our actions, yet regulators are increasingly placing a focus on such consequences when deciding whether and how to formulate rules for the control of pollution.

The idea of runoff is not intuitive to individuals or businesses, but knowledge of legal liabilities for actions that create externalities through runoff is increasingly important. As our understanding of water quality and sources of pollution becomes more sophisticated, cognizance of the implications of the effects of that car wash or coal wash becomes far more important for the analysis of legal compliance and legal responsibility.

The answer to all the questions posed above, and similar ones, is—"perhaps." The conclusion rests on containment of possible pollutants, internalization of the costs of activities, the

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harms that actions cause, and the appropriate legal controls and remedies if, indeed, those actions harm others. The other primary issue is whether, even if harm is caused, whether individuals or government can ever figure out the source of the pollution. Whether there is or should be legal responsibility for such pollution lies at the heart of the urban runoff debate. The possibility that personal or business actions will create externalities, including eventual runoff that carries "leftovers" into water bodies, is a highlight of recent regulatory discussion on pollution control.

The alley behind my former Washington, D.C. condominium had a problem. Food waste, grease, and undoubtedly contaminated water from next door, a small-business restaurant, poured down the sloping alley into local sewage drains every night. The restaurant management released this greasy waste with, I suspect, no recognition of the consequences or the potential illegality. I often wondered whether these owners knew the legal requirements, whether they had a permit to dump kitchen waste, and whether they knew the consequences of this runoff. I also wondered about the pervasiveness of such practices throughout similar businesses. I believe that state and federal regulators wonder as well, which explains the increased promulgation of regulations and increased monitoring and enforcement of runoff.

A solution to controlling the imposition of negative externalities has long eluded regulators and private enforcers. My restaurant neighbor when I lived in downtown Washington, D.C., nightly spewed its garbage into a descending alley—it was runoff that ended up in sewers, streets, and sidewalks. Now this is an activity that is replicated—intentionally or unintentionally—throughout commercial activities. I highly doubt the Environmental Protection Agency (EPA) ever visited my restaurant neighbor. But the EPA and others are nonetheless concerned. If the restaurant example is not concrete evidence of a problem, consider instead the building of a home and the wood chips and chemicals seeping into a stream. Consider the processing of coal that may let some waste slide into a lake. Consider the cutting down of trees and whether the wood chips or gasoline that ends up in a nearby water body should be considered "pollution." This paper will examine: (1) whether existing authorities (like the Clean Water Act) are capable of providing regulation of urban runoff; (2) whether, in light of economic controls, regulating these activities is necessary; (3) a summary of recent runoff litigation; and (4) what is next, or what should be next. Although each of these questions forms the background inquiry, the primary emphasis of this article is on externalities, traceability, collective action, and free rider problems that motivate regulation in this

area.

Part I of this article provides a general background of Clean Water Act (CWA) regulations and concerns related to runoff. Part II discusses the concept of externalities—how runoff allows for the imposition of costs on others and leads to a lack of internalization of costs on the individuals or companies generating the original substances that end up causing harm. Part III discusses the regulatory atmosphere as a result of the difficulty of tracing the sources of runoff and therefore assigning liability. Part IV explores the necessity of regulation in light of these economic realities, questions whether efficiency demands broad regulation to preclude or assess liability for runoff, and assesses whether responsibility can be efficiently allocated, or whether it is inefficient to try. Regulation may be necessary, but economic realities must be made part of the analysis in developing such regulation.

Rather than critique or suggest particular regulatory approaches, this article remains largely agnostic and focuses on discussing the complexities and difficulties that must be taken into consideration as regulations develop and are applied in this area. This article attempts to identify the metrics, economics, and realities that must underlie runoff regulation. The ultimate conclusion is that economics must be taken into account and may, at times, warrant governmental regulation; however, there should never be a presumption of government intervention, but, instead, an enlightened analysis of economic realities before any such regulation is imposed.

II. BACKGROUND

"Environmental protection was not a distinct field of law before 1970. Since that time, it has become a growth industry and has enjoyed widespread political support . . . ."[1] One of the major governmental initiatives among 1970s legislation was clean water. Compared to other governmental initiatives, the history of clean water legislation may seem short, but the passage and application of the CWA has a nearly thirty-five year history with ever-evolving focuses of concern.[2] Runoff is one of regulators' most recent priorities.

1 RICHARD A. EPSTEIN, SIMPLE RULES FOR A COMPLEX WORLD 275 (1995).

2 For a fairly comprehensive summary of the CWA and its amendments, see Kenneth M. Murchison, *Learning From More Than Five-and-a-Half Decades of Federal Water Pollution Control Legislation: Twenty Lessons for the Future*, 32 B.C. ENVTL. AFF. L. REV. 527, 528–81 (2005); Shawn J. Johnson, Note, *It All Comes Out in the Wash:* Sierra Club v. Meiburg*: Nonpoint Source Pollution Continues Unabated as the Eleventh Circuit Refuses to Permit Implementation of Total Maximum Daily Loads Through Citizen Suits,* 57 ARK. L. REV. 349, 359–65 (2004).

As Reed Benson notes, "[w]ater pollution has been a major environmental issue in the United States for more than three decades, and polls indicate that the public remains very concerned about the contamination of America's rivers, streams, and lakes."[3] The concern may be rational or irrational, but it is a present concern.[4] Thus, the formulation of legal rules regarding water pollution—private or public—must receive serious examination.[5]

The issue of runoff extends far beyond restaurant grease flushing down a sewer. Many industries are affected—development materials, mining waste, agricultural and animal byproducts, pesticides, fertilizers, sawdust, oils, household chemicals, and many other substances can be washed into water streams.[6] Once these types of substances are on the ground, rain or other means can make them "run off," which is then released into watersheds. Several sections of the CWA have implications for runoff.[7]

The CWA was intended "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[8] At the same time, it recognizes that federal standards are not meant to overwhelm historically recognized state controls over their own waters.[9] How states and the federal government create controls, and how they allocate responsibilities, over water quality lies at the heart of the debate over the runoff issue.[10] After all,

3 Reed D. Benson, *Pollution Without Solution: Flow Impairment Problems Under Clean Water Act Section 303,* 24 STAN. ENVTL. L.J. 199, 200 (2005).

4 *See* EPA, What is Nonpoint Source (NPS) Pollution? Questions and Answers, http://www.epa.gov/owow/nps/qa.html (last visited Apr. 8, 2006) [hereinafter EPA, Questions and Answers].

5 *See generally* Benson, *supra* note 3 (scrutinizing the Clean Water Act and discussing how its proper implementation could better achieve the Act's stated goals).

6 EPA, Questions and Answers, *supra* note 4.

7 *See* Pronsolino v. Nastri, 291 F.3d 1123, 1125–29 (9th Cir. 2002) (providing a brief summary of the relevant provisions of the CWA). Other recent symposia have also addressed some of these issues. *See* Symposium, *The Clean Water Act at Thirty: Progress, Problems, Potential*, 55 ALA. L. REV. 537 (2004); Symposium, *The Clean Water Act Turns 30: Celebrating Its Past, Predicting Its Future*, 33 ENVTL. L. 27 (2003).

8 Clean Water Act § 101(a); 33 U.S.C. § 1251(a) (2000).

9 *See, e.g.*, Clean Water Act § 101(b); 33 U.S.C. § 1251(b) (2000) (acknowledging "the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution"). For a discussion of the general economics of federalism concerns, see RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 695–96 (5th ed. 1998).

10 Consider, for example, these comments from Murchison, describing federal versus state land use controls:

> In the United States, pollution from nonpoint sources presents the most obvious example of this resistance to effective water pollution control. In part, the exclusion of nonpoint sources arises from the difficulty of controlling pollution that enters water bodies from diffuse rather than discrete sources, but the philosophical basis runs much deeper. United States environmental law has always backed away from direct federal control of land use, and land use con-

when we are dealing with water, a transient, moving, and often uncontained resource, boundaries are difficult to define.[11]

The CWA has been fairly successful in its initial focus on controlling direct dumping of pollutants into waterways. However, as the nation moves forward, attention has increasingly turned to focus on the effects of runoff on overall water quality.[12] We are beyond the formative years of water quality regulation, but perhaps not in relation to runoff.[13] In recent years, much more focus has been placed on the regulatory control of runoff. It is, in part, a regulatory success that the prioritization of governmental efforts can now explore less direct contributions to poor water quality, like runoff.[14] As a result of this prioritization, the major issues are now: the whether, the how, the means, and the necessity of regulation. This article argues that each of these issues should be decided after considering an analysis of economic

> trols are the basis for effective control of water pollution from nonpoint sources. Nowhere is this aversion to federal land use regulation more ingrained than with respect to agricultural pollution.

Murchison, *supra* note 2, at 581.

11 *See* Richard J. Lazarus, *Judging Environmental Law*, 18 TUL. ENVTL. L.J. 201, 206–07 (2004). As Lazarus explains:

> Activities in one part of the country can affect environmental quality in locations tens, if not hundreds or thousands, of miles away. In the natural environment, cause and effect are also spread out over long periods of time. Actions taken today can have environmental impacts that last for centuries and, in some instances, do not even have any perceptible impact for decades. The upshot is both tremendous scientific uncertainty in cause and effect and an inherent lack of equivalency between who pays the costs of environmental protection and who enjoys the benefits of that protection. Environmental legal rules invariably regulate activities at one location and/or at one time in order to avoid harms or confer benefits on persons or environmental amenities at another place or time.

Id. (footnote omitted). *See also id.* at 207 (describing the "tension with the physical nature of the problem, which does not so neatly follow state borders and which naturally pits downstream and downwind states and localities against upstream and upwind states and localities").

12 Sonya Dewan, Note, *Emissions Trading: A Cost-Effective Approach to Reducing Nonpoint Source Pollution,* 15 FORDHAM ENVTL. L. REV. 233, 237 (2004) ("The desire to regulate nonpoint source pollution is relatively new . . . ."); *see also* Murchison, *supra* note 2, at 527 ("In the United States, federal water pollution control legislation has evolved significantly over the last five-and-a-half decades. Since 1948, the federal government has assumed an increasingly dominant role in efforts to control the pollution of surface waters.").

13 *See* Lazarus, *supra* note 11 at 212 ("We have largely failed to impose effective controls on nonpoint sources of pollution, especially of water pollution, which threaten to overwhelm the environmental progress achieved by controls imposed on point source industrial dischargers of pollution into the nation's waters."); *see also* Oliver A. Houck, *TMDLs: The Resurrection of Water Quality Standards-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REP. 10329 (1997); Oliver A. Houck, *The Clean Water Act TMDL Program V: Aftershock and Prelude*, 32 ENVTL. L. REP. 10385 (2002); Murchison, *supra* note 2, at 587 ("[P]ollution from nonpoint sources constitutes an ever greater portion of the remaining pollution . . . .").

14 *See* Murchison, *supra* note 2, at 527.

realities.[15]

Enacted in 1972, the CWA functions primarily by prohibiting any "discharge" of pollutants to waters of the United States from a "point source" without a permit.[16] A "point source" is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel . . . from which pollutants are or may be discharged."[17] The National Pollutant Discharge Elimination System (NPDES), established in CWA section 402, provides a system for the permitting of any discharge of pollutants from a point source.[18] The NPDES is a federal program, but it may be, and most often is, administered by States that have enacted laws deemed equivalent to those existing in the federal system.[19] Diffuse runoff, such as rain water that is not channeled through a "point source," is considered nonpoint source pollution and is generally not subject to federal regulation.[20]

Where storm water is channeled, such as by municipal storm water drains, the resulting point source discharge is subject to CWA regulation. One very common type of storm water discharge is from municipal storm sewer systems, which collect runoff from wide areas, channel it, and ultimately discharge it to a waterbody through a "point source." Virtually any other type of land use activity can also be a source of storm water discharge, if runoff from the area becomes channelized or otherwise discharged through a point source to waters of the United States.[21]

During the 1970s and 1980s, it became apparent that the sheer diversity and number of "storm water discharges" made them ill-suited for regulation under the original NPDES system.[22] Thus, in the Water Quality Act of 1987, Congress amended the CWA in part to establish a new scheme to regulate storm water discharges under CWA section 402(p).[23] The storm

15 *See* POSNER, *supra* note 9, at 3–4 ("[E]conomics is the science of rational choice a world—our world—in which resources are limited in relation to human wants.").

16 Clean Water Act §§ 301, 402(a); 33 U.S.C. §§ 1311, 1342(a) (2000).

17 Clean Water Act § 502(14); 33 U.S.C. § 1362(14) (2000).

18 Clean Water Act § 402; 33 U.S.C. § 1342 (2000).

19 Clean Water Act § 402(b), 33 U.S.C. § 1342(b) (2000); *see also* EPA, National Pollutant Discharge Elimination System (NPDES): State Program Status, http://cfpub.epa.gov/npdes/statestats.cfm (listing status of NPDES programs by state) (last visited May 15, 2006).

20 *See* Oregon Natural Desert Ass'n v. Dombeck, 172 F.3d 1092, 1093–95 (9th Cir. 1998).

21 *See, e.g.,* American Mining Congress v. U.S. Envtl. Prot. Agency, 965 F.2d 759, 762 (9th Cir. 1992) (upholding EPA regulation of storm water discharges from abandoned mines).

22 *See* 133 CONG. REC. 1,264 (1987).

23 Clean Water Act §402(p); 33 U.S.C. § 1342(p) (2000); *see also* EPA, *National Pollution Discharge Elimination System Permit Application Regulations for Storm Water Discharges*, 55 Fed. Reg. 47,990 (Nov. 16, 1990).

water program is the one of greatest significance for "runoff" issues, although other parts of the CWA admittedly play a role. There is a debate dealing with the identification of runoff that is "channeled" through a "point" like a sewage system and runoff that simply contributes pollution to a water body—and how to regulate each given available statutory authority.[24] The EPA has adopted various techniques to deal with regulating both.

Therefore, the subject of this journal issue and its related symposium—runoff—is often described as "non-point source" pollution and regulated generally under the auspices thereof.[25] There is a need to determine how water bodies can be protected from trans-boundary pollution from non-discrete sources.[26] The purpose of this article is to stress that none of the available regulatory options can be accomplished or analyzed efficiently without a basic recognition of the economic realities involved.

According to the United States Environmental Protection Agency, "[s]tates report that nonpoint source pollution is the leading remaining cause of water quality problems."[27] Nonpoint source pollution involves substances that end up in the water stream, but not as a result of straight out-of-the-pipe dumping known as "point source" pollution.[28] Although debatable, some

24 For a judicial analysis of competing arguments, see Pronsolino v. Nastri, 291 F.3d 1123, 1126 (9th Cir. 2002).

25 "Nonpoint sources of pollution are non-discrete sources; sediment run-off from timber harvesting, for example . . . ." *Id.*; *see also* Thomas K. Ruppert, *Water Quality Trading and Agricultural Nonpoint Source Pollution: An Analysis of the Effectiveness and Fairness of EPA's Policy on Water Quality Trading,* 15 VILL. ENVTL. L.J. 1, 33 (2004) ("Runoff from agriculture now constitutes one of our most serious water quality problems.").

26 *See, e.g.,* Lazarus, *supra* note 11, at 212.

27 EPA, Questions and Answers, *supra* note 4; *see also* Erin Tobin, Pronsolino v. Nastri*: Are TMDLS for Nonpoint Sources the Key to Controlling the "Unregulated" Half of Water Pollution?,* 33 ENVTL. L. 807 (2003):

> Without dispute, nonpoint source pollution is the nation's leading water quality problem, contributing to nearly half of the water quality impairment nationwide. Nonpoint source pollution commonly refers to polluted runoff from diffuse sources such as agricultural activities, timber harvest, urban development, and grazing.

Id. at 808 (footnote omitted). *See also* Dewan, *supra* note 12, at 233 ("A significant amount of U.S. water pollution originates from nonpoint sources . . . ."); Benson, *supra* note 3, at 225 ("[A]gricultural runoff constitutes the biggest remaining source of water pollution problems in the nation. . . . [H]uman-caused flow alterations represent a significant and commonly overlooked form of nonpoint source pollution under the CWA."); *See also generally* Drew L. Kershen, *Agricultural Water Pollution: From Point to Nonpoint and Beyond*, 9 NAT. RESOURCES & ENV'T 3, 3–5 (1995).

28 A point source is "any discernible, confined and discrete conveyance" having a particular "point" at which pollutant levels can be measured. Clean Water Act § 502(14); 33 U.S.C. § 1362(14) (2000). *See also* Sierra Club v. Meiburg, 296 F.3d 1021, 1024–25 (11th Cir. 2002); Ruppert, *supra* note 24, at 26 (footnotes omitted) ("After initial passage of the CWA in 1972, attention was focused on point sources of pollution. Point sources (PSs) are usually associated with a pipe that discharges wastewater into streams, lakes,

think that nonpoint source pollution is the critical issue for water quality today. For example, Robert Adler argues:

> By now, it is beyond dispute that polluted runoff and erosion from farms, grazing lands, logging, mining, and other intensive land uses (so-called nonpoint source pollution) is the most significant remaining source of pollution in rural waters, and that contaminated urban (stormwater) runoff is similarly responsible for a significant percentage of ongoing urban and suburban water pollution. It is equally clear that those sources of pollution have escaped the type of more rigorous controls to which point sources are subjected, and that existing "solutions" to the problem are not working.[29]

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or rivers. The National Pollutant Elimination Discharge System (NPDES), which regulates the granting of permits under the CWA, represents this focus on PSs."). For a discussion of the distinction between point and nonpoint sources, see Carol M. Rose, *Environmental Law Grows Up (More or Less), and What Science Can Do to Help*, 9 LEWIS & CLARK L. REV. 273, 279 (2005). Rose explains that the first wave of water quality control focused on point source pollution and a new wave relates to nonpoint sources:

> The First Wave approaches to environmental law clearly had some success, adding needed muscle to the exercise of setting quality-based goals. Without that muscle, little would have happened for the usual tragedy-of-the-commons reasons: even industries that wished to take environmentally friendly measures might not have done so, fearing that competitors would take the cheaper route of doing nothing, evading discovery, and ultimately gaining a competitive advantage. . . . [T]here was a certain logic to another aspect of the First Wave's controls, that is, concentrating controls at the end of the pipe. The end of the pipe, or "point source" as it was called, was the place where pollution control performance could be measured easily.

Id. Rose continues to describe the facts that point sources were a natural starting point for water quality control, but claims that nonpoint sources may be a major culprit that deserves attention:

> Another "flexibility" complaint focused on the end-of-the-pipe methodology of early ["behavior based" or] BB regulation. . . . The trouble was that pollution from the point sources was easier to measure and hence to regulate, but in fact the less tractable nonpoint sources might be a bigger source of troubles. This issue has been especially noticeable in water pollution, where controls on point sources left more or less untouched the serious pollution from construction, agriculture, and city streets' runoff—all "nonpoint" sources that are hard to measure and monitor. Nonpoint sources are small and inconvenient to regulate, but they not only add up, they can also interact in various deadly forms.

Id. at 280.

29 Robert W. Adler, *Fresh Water—Toward a Sustainable Future*, 32 ENVTL. L. REP. 10167, 10184 (2002). *See also* Oliver A. Houck, *TMDLs, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act,* 27 ENTVL. L. REP. 10391, 10399 (1997) (footnote omitted) ("It is no secret to any observer of the Clean Water Act that the primary reason for this mushrooming [nonpoint source pollution] problem is the fact that while other sources have been abated through required controls and their enforcement, no comparable controls or enforcement have been applied to agriculture, silviculture, and the rest of the nonpoint world."); Victor B. Flatt, *Spare the Rod and Spoil the Law: Why the Clean Water Act Has Never Grown Up*, 55 ALA. L. REV. 595, 597–99 (2004) (blaming nonpoint sources for continuing pollution problems); Ruppert, *supra* note 25, at 3 ("As significant water quality improvements resulted from the NPDES program and PS pollution reductions, it became clear that non-point source (NPS) pollution contributes greatly to remaining water quality problems. It eventually became evident that PS reductions alone would not suffice to clean up waterways and that the challenges presented by NPSs needed to be addressed.").

Adler identifies the sensitivities regarding runoff that have been used to justify recent regulatory efforts.

There is certainly a heightened sensitivity among regulators and environmental interest groups over the potential impact of nonpoint source pollution.[30] Although it is difficult to fully discern what is "pollution" in nonpoint source pollution, the EPA defines it as the following:

> Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:
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> - Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
> - Oil, grease, and toxic chemicals from urban runoff and energy production;
> - Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks;
> - Salt from irrigation practices and acid drainage from abandoned mines;
> - Bacteria and nutrients from livestock, pet wastes, and faulty septicsystems;
>
> Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.[31]

As a result, determining the origin of certain pollutants becomes very difficult—if they cannot be traced to a certain dumping pipe because the substances simply runoff from a nonpoint source, it becomes far more difficult to identify the origin of contaminants.[32] This article explores these difficulties.

The EPA has explained the importance, significance, and issue of urban runoff as follows:

> *The National Water Quality Inventory: 2000 Report to Congress* identified urban runoff as one of the leading sources of water quality impairment in surface waters. Urban sources can also contaminate ground water. . . .

30 EPA, *Nonpoint Source Program and Grants Guidelines for States and Territories,* 68 Fed. Reg. 60,653 (Oct. 23, 2003).

31 EPA, Questions and Answers, *supra* note 4.

32 "Nonpoint source pollution, including the potential for groundwater contamination, is not easily addressed by the means which are employed for controlling pollutants from point sources." Martha L. Noble & J.W. Looney, *The Emerging Legal Framework for Animal Agricultural Waste Management in Arkansas*, 47 ARK L. REV. 159, 177–78 (1994).

> People and their actions are the most significant sources and causes of urban runoff and pollution. [33]

The EPA continues to define the most substantial areas of urban runoff concern:

> Uncontrolled or treated runoff from the urban environment and from construction activities can run off the landscape into surface waters. This runoff can include such pollutants as sediments, pathogens, fertilizers/nutrients, hydrocarbons, and metals. Pavement and compacted areas, roofs, and reduced tree canopy and open space increase runoff volumes that rapidly flow into our waters. This increase in volume and velocity of runoff often causes stream bank erosion, channel incision and sediment deposition in stream channels. In addition, runoff from these developed areas can increase stream temperatures that along with the increase in flow rate and pollutant loads negatively affect water quality and aquatic life.
>
> Other common sources of urban pollution include improperly sited, designed and maintained onsite wastewater treatment (septic) systems, pet wastes, lawn and garden fertilizers and pesticides, household chemicals that are improperly disposed of, automobile fluids, road deicing/anti-icing chemicals, and vehicle emissions.[34]

In addition to and in conjunction with federal regulation, most states have implemented plans to control for the contribution of runoff and non-point source pollution to water quality, but it is a still developing area of environmental law.[35] The complex-

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33 EPA, National Management Measures to Control Nonpoint Source Pollution from Urban Areas, http://www.epa.gov/owow/nps/urbanmm/#01 (last visited Apr. 11, 2006) [hereinafter EPA, National Management Measures], EPA-841-B-05-004, NATIONAL MANAGEMENT MEASURES TO CONTROL NONPOINT SOURCE POLLUTION FROM URBAN AREAS (2005), *available at* http://www.epa.gov/owow/nps/urbanmm/pdf/urban_guidance.pdf. For a discussion of regulatory guidance on best management practices (BMPs) to control and prevent urban runoff, see EPA, OFFICE OF WATER, EPA-841-B-00-007, TECHNIQUES FOR TRACKING, EVALUATING, AND REPORTING THE IMPLEMENTATION OF NONPOINT SOURCE CONTROL MEASURES: III URBAN (2001), *available at* http://www.epa.gov/owow/nps/urban.pdf. Other informative materials on EPA's response to nonpoint source issues include: Envtl. Def. Ctr., v. U.S. Envtl. Prot. Agency, 319 F.3d 398 (9th Cir. 2003); City of Abilene v. U.S. Envtl. Prot. Agency, 325 F.3d 657, 664 (5th Cir. 2003); OLIVER A. HOUCK, THE CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION 50–51 (2d ed. 2002); Linda A. Malone, *The Myths and Truths That Ended the 2000 TMDL Program*, 20 PACE ENVTL. L. REV. 63, 63–64 (2002); James R. May, *The Rise and Repose of Assimilation-Based Water Quality, Part I: TMDL Litigation*, 34 ENVTL. L. REP. 10247 (2004); Thomas G. Echikson & Gregory P. Lauro, *When It Rains It Pours: Past, Present, and Future Regulation of Wet Weather Discharges*, 34 ENVTL. L. REP. 10150 (2004); Edwin A. Skoch, II, *Regulation of Storm Water Discharges Under the Clean Water Act*, 23 ENVTL. L. 1087, 1087–94 (1993); David Strifling, *Sanitary Sewer Overflows: Past, Present, and Future Regulation*, 87 MARQ. L. REV. 225, 230–32 (2003); Laurel A. David, *The EPA's Combined Sewer Overflow Abatement Methods: Do They Comply with the Clean Water Act*, 35 URB. LAW. 533, 541–44 (2003); Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21 (2002).

34 EPA, National Management Measures, *supra* note 33.

35 *See generally* ENVTL. LAW INST., ALMANAC OF ENFORCEABLE STATE LAWS TO CONTROL NONPOINT SOURCE WATER POLLUTION (1998).

ity of this process of regulation, however, is high.[36] Although there is a perceived need to add further regulatory controls, the EPA has recognized that "the nation is experiencing increasingly positive results in terms of both on-the-ground action and actual water quality improvements."[37] The overall issue of regulation of runoff and nonpoint sources requires continuing analysis and must take into account both positive and negative environmental and economic consequences of regulation.[38]

III. RUNOFF AND CONTROL OF EXTERNALITIES

Effective control of externalities is a fundamental basis of property law.[39] Pollution control necessarily involves issues of property law.[40] Property law continuously struggles to find an efficient allocation of liabilities for the harms one owner's actions may impose on others.[41]

Harold Demsetz describes this concept well when he explains that "[a] primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities."[42] When property rights and boundaries are ill-defined, it becomes difficult to control depletion of resources and to control pollution.[43] As a result, there are always tensions between pri-

36 *See generally* Robert W. Adler, *Controlling Nonpoint Source Water Pollution: Is Help on the Way (From the Courts or EPA)?*, 31 ENVTL. L. REP. 10270 (2001).

37 EPA, Nonpoint Source Program and Grants Guidelines for States and Territories, 68 Fed. Reg. 60,653, 60,654 (Oct. 23, 2003).

38 For an economic justification for regulation in this area, see EPA, OFFICE OF WETLANDS, OCEANS AND WATERSHEDS, EPA-841-S-95-002, ECONOMIC BENEFITS OF RUNOFF CONTROLS (1995), *available at* http://www.epa.gov/owow/nps/runoff.html.

39 Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347, 348 (1967); *see also* Henry E. Smith, *Exclusion Versus Governance:* Two Strategies for Delineating Property Rights, 31 J. LEGAL STUD. S453, S486 (2002) ("A number of patterns in property rights can be explained as variation along the methods of delineation, reflecting their respective costs and benefits."); JESSE DUKEMINIER & JAMES E. KRIER, PROPERTY 48 (5th ed. 2002) ("'Externality,' Demsetz says, 'is an ambiguous concept.' It is also an important one that you will be confronting more than occasionally [in the study of property law].").

40 Dukeminier & Krier, *supra* note 39, at 55 ("Pollution and other environmental problems have important relationships to property . . . ."). For a valuable discussion of property law, including its interaction with governmental regulation, see generally Herbert Hovenkamp & Sheldon F. Kurtz, The Law of Property: An Introductory Survey (5th ed. 2001).

41 *See* POSNER, *supra* note 9**,** at 36 (discussing the impacts of externalities and noting that "legal protection of property rights creates incentives to exploit resources efficiently.").

42 Demsetz, *supra* note 39, at 348. *See also generally* Fred S. McChesney, *What'd I Say?: Coase, Demsetz and the Unending Externality Debate* (Northwestern University School of Law, Law & Economics Research Paper Series, Research Paper No. 04-01), *available at* http://papers.ssrn.com/abstract=491182.

43 *See generally* Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968); James M. Buchanan & Young J. Yoon, *Symmetric Tragedies: Commons and Anticommons*, 43 J.L. & ECON. 1 (2000); Henry E. Smith, *Semicommon Property Rights and Scattering in the Open Fields*, 29 J. LEGAL STUD. 131 (2000); HENRY N. BUTLER &

vate/market-based land use controls and public land use controls to solve such externality issues, depending on economic values and the appropriate role for government.[44] "The practical problem is one of extension and elaboration of the private rights of action into the public sphere."[45] Judicial land use controls like trespass and nuisance were the starting point,[46] but increasingly governmental regulation has been viewed as necessary for effectively controlling externalities based on the theory that individuals subject themselves to the government's jurisdiction and the government has a responsibility to control against the imposition of harms.[47]

Externalities are the imposition of costs or benefits on another as a result of one's use of his property.[48] As the Council on Environmental Quality explained, part of environmental ~~l~~regulation is based on controlling such external costs when they cannot be controlled by the market:

> Our price system fails to take into account the environmental damage that the polluter inflicts on others. Economists call these damages . . .

CHRISTOPHER R. DRAHOZAL, ECONOMIC ANALYSIS FOR LAWYERS 21–24 (2d ed. 2006).

44 *See* Demsetz, *supra* note 39, at 350 ("Some communities will have less well-developed private ownership systems and more highly developed state ownership systems." *see also* Armen A. Alchian & Harold Demsetz, *The Property Right Paradigm*, 33 J. ECON. HIST. 16, 22 (1973) ("The social consequences of the identity of right owners also can have allocative effects. At the more obvious level, government and private owners, respectively, will respond in greater degree to political and market incentives, and this can be expected to yield differing resource uses."); Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 9 (1960) ("[T]here is no reason why, on occasion, such governmental administrative regulation should not lead to an improvement in economic efficiency. This would seem particularly likely when, as is normally the case with the smoke nuisance, a large number of people are involved and in which therefore the costs of handling the problem through the market or the firm may be high."); s*ee generally* Fred McChesney, *Government as Definer of Property Rights, in* PROPERTY RIGHTS: COOPERATION, CONFLICT, AND LAW 227 (Terry L. Anderson & Fred S. McChesney eds. 2003).

45 EPSTEIN, *supra* note 1, at 280.

46 For an analysis of the historical developments in trespass and nuisance, see H. Marlow Green, Note, *Common Law, Property Rights and the Environment: A Comparative Analysis of Historical Developments in the United States and England and a Model for the Future*, 30 CORNELL INT'L L.J. 541, 544–45 (1997). On the possible limitations of tort law to control externalities, see BUTLER & DRAHOZAL, *supra* note 43, at 122.

47 "'[I]t would be a direct contradiction for any one to enter into society with others for the securing and regulating of property, and yet to suppose his land . . . should be exempt from the jurisdiction of that government to which he himself, and the property of the land, is a subject.'" John A. Humbach, *Evolving Thresholds of Nuisance and the Takings Clause*, 18 COLUM. J. ENVTL. L. 1, 6 n.25 (1993) (quoting 2 JOHN LOCKE, TWO TREATISES OF CIVIL GOVERNMENT ch. 3, 178 (Everyman's Library 1991) (1690)).

48 As Demsetz explains:

> It is important to note that property rights convey the right to benefit or harm oneself or others. . . . [P]roperty rights specify how persons may be benefited or harmed, and, therefore, who must pay whom to modify the actions taken by persons. The recognition of this leads easily to the close relationship between property rights and externalities.

Demsetz, *supra* note 39, at 347.

> "external social costs." They reflect the ability of one entity, e.g., a company, to use water or air as a free resource for waste disposal, while others pay the cost in contaminated air or water. If there were a way to make the price structure shoulder these external costs—taxing the firm for the amount of discharge, for instance—then the price for the goods and services produced would reflect those costs. Failing this, goods whose production spawns pollution are greatly underpriced because the purchaser does not pay for pollution abatement that would prevent environmental damage. Not only does this failure encourage pollution but it warps the price structure.[49]

Thus, external costs are a possible justification for governmental control of pollution, including runoff—bypassing or rejecting a market approach.[50]

There are both negative and positive externalities associated with individual actions that play into the framework and formation of legal rules and priorities.[51] When costs are imposed on another, there are negative externalities.[52] Runoff is generally placed in this category. With negative externalities, one uses his property and internalizes the benefits or profit of the use, but does not internalize all negative consequences of that use.[53] When benefits are captured by another, there are positive externalities.[54] One uses his property and internalizes most benefits, but the use actually brings profits to another outside the system of exchange. Given these realities, the externality issue involves the analysis of property uses and whether both costs and benefits are internalized and how doctrines or regulations should develop as a result.[55]

Robert Cutting and Lawrence Cahoon describe pollution as

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49 THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY, at 12 (1970).

50 "Most pollution policy . . . is not approached from a property rights perspective, where compensation and liability provide incentives for control; rather, public policy accepts pollution as a public bad that is the government's responsibility." TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM 136 (1991).

51 BUTLER & DRAHOZAL, *supra* note 43**,** at 176–86.

52 *Id.* at 175 ("Pollution and similar problems occur when people do not bear all of the costs of their actions."). *See also id.* at 20, 121–22, 175–218, 336–40.

53 *See, e.g.,* Demsetz, *supra* note 39, at 348 ("'Internalizing' such effects refers to a process, usually a change in property rights, that enables these effects to bear (in greater degree) on all interacting persons.").

54 *See* BUTLER & DRAHOZAL, *supra* note 43, at 184–86.

55 As Dukeminier and Krier explain:

> Externalities exist whenever some person, say *X*, makes a decision about how to use resources without taking full account of the effects of the decision. *X* ignores some of the effects—some of the costs or benefits that would result from a certain activity, for example—because they fall on others. They are "external" to *X*, hence the label *externalities*. As a consequence of externalities, resources tend to be misused or "misallocated," which is to say used in one way when another would make society as a whole better off.

DUKEMINIER & KRIER, *supra* note 39, at 48. *See also id.* at 55, 745, 859, 951.

involving generators and receptors—persons who generate pollutants and persons who receive negative externalities from such generation.[56] They explain this issue of controlling transboundary effects:

> The political institutions and the Property Rights Movement since the Industrial Revolution have honed in on the rights within private property boundaries (the "generators"), to the exclusion of the rights of those outside those boundaries (the "receptors"). This has created a classic, "can't see the forest for the trees" scenario, and we suggest that the field of vision ought to be broadened to include: 1) the rights of all receptors (landowners and lawful occupiers, public or private) to be free of the effects of pollution ("externalities"), and 2) the responsibility of all generators of environmental alteration to safeguard those rights. To paraphrase George Carlin: "You should keep your stuff in your space." Any alteration of nature must (in addition to any other onsite regulations) be contained within the three-dimensional construct of the property boundaries. This methodology directly internalizes all potential off-site effects of any action. The burden should be on the generator to identify, and to contain or mitigate, all transboundary effects.[57]

The question becomes whether the generators have responsibilities to the unwilling receptors (individuals or society as a whole) for any harms imposed.[58] It is a question of preserving efficiency by identifying the types of legal controls that can lead to the internalization of harms from one's use of property.[59] The cynical view is that, absent legal controls, property owners will impose costs on other owners and society. As Carol Rose claims, "[l]andowners become accustomed to regarding their land as their property, but they simultaneously regard the adjacent air, water, and wildlife as goods that are free for the taking . . . ."[60] James Huffman describes this concept of internalization as follows:

> The efficiency theory assumes that market participants bear the full costs of their activities. When those costs are "externalized" to third parties, there is a market failure in the sense that one of the assumed conditions of an efficient market is missing. In such cases, regulations may be designed to internalize the full costs to the decision maker.[61]

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56 Robert H. Cutting & Lawrence B. Cahoon, *Thinking Outside the Box: Property Rights as a Key to Environmental Protection*, 22 PACE ENVTL. L. REV. 55, 58–59 (2005).

57 *Id.* (footnote omitted).

58 *Id.*

59 For classic instructive cases on externality controls, public and private, see: Prah v. Maretti, 321 N.W.2d 182 (Wis. 1982); Boomer v. Atlantic Cement Co., 257 N.E.2d 870 (N.Y. 1970); Spur Industries, Inc. v. Del E. Webb Dev. Co., 494 P.2d 700 (Ariz. 1972).

60 Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trade**s** and Ecosystems*, 83 MINN. L. REV. 129, 137 (1998).

61 James L. Huffman, *The Public Interest in Private Property Rights*, 50 OKLA. L. REV. 377, 380 n.11 (1997). *See also* William Simmons & Robert H. Cutting, Jr., *A Many*

Because runoff has the capability of causing pollutants on one's land to become transient, internalization of costs or containment become important issues in the formulation of legal rules, responsibilities, and liabilities.

The problems associated with runoff largely involve the imposition of negative externalities—one uses his property and resources in a manner that spills costs onto other discrete property owners or society as a whole in their interest of clean waters.[62] Just like stray soot, stray smells, stray animals, or other things that cross and transcend boundaries, runoff creates risks that negative effects will be imposed on another.[63] One could even think about it like second-hand smoke,[64] or the steam or sparks from a passing train.[65]

Demsetz offers the following example to generally explain this externality problem:

> The short-hand description for [the externality issue] is that private costs (or benefits), which do influence a resource owner, are not equivalent to the total of social costs (or benefits) associated with the

Layered Wonder: Nonvehicular Air Pollution Control Law in California, 26 HASTINGS L.J. 109, 113 (1974); J.H. DALES, POLLUTION, PROPERTY & PRICES 7–8 (1968); Erik T. Verhoef, *Externalities, in* HANDBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 197–214 (Jeroen C.J.M. van den Bergh ed., 1999).

62 *See, e.g.*, Demsetz, *supra* note 39, at 348 ("Some costs and benefits are not taken into account by users of resources whenever externalities exist, but allowing transactions increases the degree to which internalization takes place.").

63 Consider, for example, Coase's discussion of the "straying cattle which destroy crops growing on neighboring land." Coase, *supra* note 44, at 2.

64 Margaret M. Blair, *The Economics of Post September-11 Financial Aid to Airlines*, 36 IND. L. REV. 367, 371 (2003).

65 Consider Halsbury's description of the "spark" externality from trains and the associated risk as analgous to the movement of materials by water runoff:

> If railway undertakers use steam engines on their railway without express statutory authority to do so they are absolutely liable for fires caused by sparks from engines. However, railway undertakers generally have statutory powers to use steam engines and therefore, if an engine incorporates up-to-date precautions against the escape of sparks and is used without negligence, they will not be liable at common law for damage resulting from that escape.
>
> The fact that sparks from an engine caused a fire appears to raise a presumption that the undertakers were negligent, but it is always a question of fact whether, on the evidence, they were guilty of negligence in the construction or the use of the engine or in some other way in relation to the fire. In the design and construction of a steam engine, the undertakers are bound to use all the available devices (for instance spark arresters) to avoid doing harm having regard to the likelihood of the danger and the cost and convenience of the remedy, but there is no negligence if the undertakers refuse to use an apparatus the efficiency of which is open to doubt.
>
> Although there may be negligence in the design, construction or working of the engine, an undertaker may be liable for damage done by fire caused by sparks if, by leaving inflammable material close to the line, its negligence caused the damage.

39(1) HALSBURY'S LAWS OF ENGLAND 18–19 (4th ed. 1998) (under the heading "Sparks from engines").

> way an owner uses his resources. An example . . . concerns the use of soft coal by a steelmaker. The soft coal produces soot. The soot descends on a neighboring laundry, making it more difficult for the laundry to clean its customers' clothes, but this cost is not faced by the owner of the steel mill when he decides to use soft coal to fuel the steelmaking process.[66]

Just as soot, in this example, can fly through the air and affect another business or the general quality of the air consumed by the public, pollutants can be washed away by water into particular or publicly shared water resources.

In property law, furthermore, the concept of s*ic utere tuo ut alienum non laedas* dominates, where individuals may use their property as they wish so long as they internalize the costs of their actions, and respect their neighbors by not imposing negative externalities.[67] Runoff involves the imposition of foreign costs upon others. Thus, the extraterritorial and trans-boundary nature of runoff has been used, on this basic principle, to justify private and public land use controls and judicial remedies for the imposition of such harms from such runoff—*i.e.*, the party is responsible if their pollutants end up somewhere else. One reason for legal intervention is that this party, whether by his own actions or the forces of nature, has imposed a cost on another.[68] Secondly, private and public regulation assume that the owner at the point of origin is the least cost avoider of the harms that may result from runoff and, therefore, should have liability if things stray and should also have responsibility to contain pollutants.[69]

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66 Harold Demsetz, *Ownership and the Externality Problem, in* PROPERTY RIGHTS: COOPERATION, CONFLICT, AND LAW 282, 283 (Terry L. Anderson & Fred S. McChesney eds. 2003). *See also* Harold Demsetz, *Toward a Theory of Property Rights II: The Competition Between Private and Collective Ownership,* 31 J. LEGAL STUD. S653, S665 (2002) ("Externality-type problems remain an important consideration . . . .").

67 *See, e.g.*, Munn v. Illinois, 94 U.S. 113, 145 (1876) ("The doctrine that each one must so use his own as not to injure his neighbor—*sic utere tuo ut alienum non laedas*—is the rule by which every member of society must possess and enjoy his property . . . .").

68 As Butler and Drahozal describe:

> Externalities exist when the actions of one party affect the utility or production possibilities of another party outside the exchange relationship. Externalities can prevent a free market from being efficient. If a firm emits pollution into the air, it can adversely affect the welfare of the firm's surrounding neighbors. If the firm does not bear these costs, it is likely to select an inefficient level of pollution (that is, to overpollute). In choosing how much to invest in pollution control equipment, the firm will consider only its private costs and benefits. A socially-efficient investment would also consider the costs and benefits imposed on the neighbors.

BUTLER & DRAHOZAL, *supra* note 43, at 25–26.

69 Ruppert explains:

> Externalization of agriculture's pollution costs leads not only to distributional concerns, but also to efficiency concerns. Conventional economic analysis makes farming practices that externalize costs to the environment look more efficient than those practices that reduce impacts on the environment.

Basically, runoff involves the migration of pollutants—and the imposition of costs on others when one's actions do not fully internalize the costs of pollutants carried by stormwater from one property to another. "Pollution is the most obvious example of an externality."[70] The challenge is to determine: (1) what constitutes a "pollutant"; (2) what culpability we should place on individuals for natural migration of such "pollutants"; (3) what responsibilities should we place on individuals for preventing such migration, or liability once it occurs; and (4) what method of control is appropriate, primarily whether private or public regulatory controls are optimal and appropriate. Thus, a fundamental economic consideration is this allocation of controls and liabilities in light of these four issues. Speaking in relation to private remedies, Ronald Coase aptly describes this formational legal issue, equally applicable to private or public, judicial or legislative, controls:

> What has to be decided is whether the gain from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the action which produces the harm. In a world in which there are costs of rearranging the rights established by the legal system, the courts, in cases relating to nuisance, are, in effect, making a decision on the economic problem and determining how resources are to be employed.[71]

Discussing the relative benefits of private versus governmental controls, Coase continues: "[C]orrective government action . . . is not necessarily unwise. But there is a real danger that extensive government intervention in the economic system may lead to the protection of those responsible for harmful effects being carried too far."[72]

It is argued that "corrective" governmental regulation exists to address market failures[73]—when people cannot negotiate to

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> Accounting for externalized costs and inputting them into the analysis allows conservation-type farming methods to compete economically. . . . While the efficiency of cost internalization dictates that agriculture should shoulder its costs to abate its pollution as we have required of other industries and activities, policy regarding agriculture and the environment should, at a minimum, not be structured in a way that promotes environmental harm. . . .

Ruppert, *supra* note 25, at 25–27.

70 BUTLER & DRAHOZAL, *supra* note 43, at 122.

71 Coase, *supra* note 44, at 11.

72 *Id.*

73 *See., e.g.*, Stephen E. Draper, *The Unintended Consequences of Tradable Property Rights to Water*, 20 NAT. RESOURCES & ENV'T 49, 51 (2005) ("The externalities that result in the failure of tradable property rights to water are significant. Transaction costs can severely distort the economic efficiency of private water allocation markets."); *see also* Coase, *supra* note 44, at 9 ("The government is, in a sense, a super-firm (but of a very special kind) since it is able to influence the use of factors of production by administrative decision.").

preclude, or compensate for, or incentivize individuals to take precautionary measures to avoid the imposition of harms on others, or create effective and efficient liability and compensation schemes when externalities are imposed.[74] All of these issues rear their head when runoff is involved.

From an economics perspective, controlling runoff or other externalities that society defines as harmful requires an analysis of whether the market, common law concepts of nuisance or trespass, or governmental regulation is the most effective way to correct externalities:

> Economic theory suggests that the correction of non-trivial externalities can be approached in a number of different ways. In general, these can be categorized as defining property rights and allowing bargaining, taxing negative externalities and subsidizing positive externalities, or establishing regulatory controls.[75]

Although Coase recognizes the potential for market failures that require government intervention in controlling externalities, he also provides a valuable caution about government efficiency:

> It is clear that the government has powers which might enable it to get some things done at a lower cost than could a private organization (or at any rate one without special governmental powers). But the governmental administrative machine is not itself costless. It can, in fact, on occasion be extremely costly. Furthermore, there is no reason to suppose that the restrictive and zoning regulations, made by a fallible administration subject to political pressures and operating without any competitive check, will necessarily always be those which increase the efficiency with which the economic system operates. Furthermore, such general regulations which must apply to a wide variety of cases will be enforced in some cases in which they are clearly inappropriate. From these considerations it follows that direct governmental regulation will not necessarily give better results than leaving the problem to be solved by the market or the firm.[76]

Coase continues by hedging that regulation may at times contribute to economic efficiency:

> But equally there is no reason why, on occasion, such governmental administrative regulation should not lead to an improvement in economic efficiency. This would seem particularly likely when, as is normally the case with the smoke nuisance, a large number of people are involved and in which therefore the costs of handling the problem

74 Smith, *supra* note 39, at 462 ("One initial take on the evolution of property rights is to focus on the costs and benefits of defining and enforcing them. Demsetz proposed that property rights are devices to internalize externalities and will develop when the gains of internalization outweigh its costs.").

75 BUTLER & DRAHOZAL, *supra* note 43, at 186.

76 Coase, *supra* note 44, at 9.

through the market or the firm may be high.[77]

As Coase suggests, when faced with issues like runoff, there is a delicate balance between the efficiency of government versus private regulation for the control of externalities.[78]

Again, economics should play a role in formulating control strategies for runoff. Market difficulties might sometimes justify regulation, but it should not be presumed that resorting to coercive regulation is the optimal solution. "It would be unwise for a society simply to ban all activities with (costly) external effects or to make all those engaging in them pay for the effects."[79] We must recognize that negative externalities occur as a result of runoff, but need not immediately jump to an assumption that governmental regulation is necessary for or capable of solving the harms that may be caused from such runoff.

IV. RUNOFF AND TRACEABILITY

When deciding between public, private, or no appropriate means of regulating runoff and other land use controls,[80] traceability is a primary issue. To assign private or regulatory liabilities, one must be able to "trace" the origin of pollutants that contribute to the degradation of a water body.[81] When traceability is difficult, it is often assumed that markets and common law remedies will fail to control externalities.[82] Determining the origin of sediment or other pollution that has "run off" from "somewhere" is very difficult.

Markets and the common law work best when foreign sources of pollution are identifiable and traceable—a harmed individual knows who to blame. "Unlike point source pollution, nonpoint source pollution does not emanate from 'discrete conveyance[s].'"[83] In the absence of traceability, two conflicting pri-

77 *Id.*

78 *Id.*

79 DUKEMINIER & KRIER, *supra* note 39, at 52; *see also id.* at 52 n.27 ("The term [externality] can quite understandably, but also quite misleadingly, be taken to suggest that the best response to external costs is always to ban or otherwise control the activities seen to give rise to them.").

80 *See id.* at 745.

81 Tanya L. Forsheit, *International Emissions Trading: Equity Issues in the Search for Market-Based Solutions to Global Environmental Degradation*, 18 U. PA. J. INT'L ECON. L. 689, 719 (1997) (discussing pollution and the difficulties of tracing the sources of harms); Christina Marie Frankino, Note, *The Ninth Circuit's Decision in* Oregon Natural Desert Association v. Dombeck*: "Discharging" Responsibility for Water Pollution on Federal Lands*, 10 VILL. ENVTL. L.J. 431, 484 n.95 (1999) (discussing traceability problems from cattle grazing).

82 *See* BUTLER & DRAHOZAL, *supra* note 43, at 25–26 (discussing how the Coase Theorem describes a market remedy when externalities can be identified).

83 Tobin, *supra* note 27, at 811.

mary choices remain for legal controls and regulators: (1) identify the problem as a market failure and create a system to regulate all potential sources or contributors; or (2) recognize the inabilities to trace such pollutants, and retreat to a point where legal controls are inappropriate, unjust, or inefficient because general controls may ensnare individuals without culpability in the costs of a generally applicable regulatory system. The debate involves command and control mechanisms versus market based mechanisms for controlling pollution.

If we know that a polluted water body has been contaminated from multiple sources, runoff and otherwise, allocating liabilities is complicated by these traceability problems. Once a polluted water body is identified, the ability to pin-point who or what contributed to the degraded nature of the water body is "exceedingly difficult," as one author explains:

> [T]here are still some feasibility problems that hinder the process [of nonpoint source pollution controls]. For example, identifying nonpoint sources is exceedingly difficult. The source of pollutants carried by water runoff is often nearly impossible to determine even with the help of the best scientists.[84]

This identification problem makes allocation of liability—private or public—also exceedingly complex, including when the government sets up programs or standards to attempt to do so.[85] Such feasibility problems raise both problems of possible under-regulation, or, more likely, over-regulation to compensate for the lack of information once the government has decided such pollution is a problem worthy of combating. Once a "better safe than sorry" approach emerges as a regulatory ethic, undoubtedly minor or non-contributors to pollution will become ensnared in costly regulation. With that reality, the issue of regulatory error is particularly acute in areas like runoff where contributions and traceability are difficult to identify or measure.

A primary difficulty with runoff regulation, therefore, is that multiple sources mix together, making a targeted liability analysis difficult. Not only do different nonpoint sources blend together, but all of those sources also mix together in a water body with pollutants from point sources, making traceability and allocation a very difficult regulatory task, at least if one is attempting to efficiently and fairly impose controls.

Even the most ardent free market environmentalists admit

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84 Johnson, *supra* note 2, at 370 (emphasis added).

85 *Id.* at 369–70 (explaining that "[i]n *Meiburg*, the Eleventh Circuit seemingly incorporated what has been the argument against nonpoint source TMDLs for many years: nonpoint source TMDLs are expensive and difficult to measure," but critiquing the argument that nonpoint source pollution sources cannot be identified and measured).

that market-based controls for water pollution are difficult because of the problems with contributory identification and traceability:

> In terms of applying a market solution to environmental problems, few areas are more troublesome than water pollution. Because polluters are often difficult to identify and because rights to clean water are not vested in individuals or clearly specified organizations, the costs of garbage disposal into streams, lakes, or oceans can be easily passed on to others. Under these circumstances, a free market solution to water pollution seems elusive.[86]

The difficulties of tracing responsible parties—or at least their level of responsibility—might justify using governmental regulation. Yet, one must ask whether the government itself can any more efficiently allocate liabilities than the market can when these traceability problems exist.[87] Perhaps, the best the government can do is engage in anticipatory or estimated liability for runoff pollution and create a regulatory system, although such a speculative enterprise (speculative precisely because for many contributions no one can know from where or whence they come) undoubtedly leads to over-regulation if that is the adopted regulatory philosophy.

With the diffuse nature of runoff, it becomes a policy choice in deciding whether the market or traditional doctrines of nuisance and trespass can handle these problems, or whether controlling actual or potential runoff contributions justify governmental intervention because of these traceability problems. All of this requires, of course, a reasoned judgment on what "sources" constitute "problems" and a decision on whether government regulators have the capacity, capability, or comprehension to make such determinations. Without confidence in traceability, there cannot be confidence in causation and liability, including allocation between potential contributors.

Three major economic problems arising from traceability problems affect the control of runoff: (1) collective action problems; (2) free rider problems; and (3) information costs.

One must be cognizant of collective action problems whenever deciding whether private individuals are capable of forming private solutions to pollution control.[88] Especially with problems

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86 ANDERSON & LEAL, *supra* note 50, at 138–39.

87 *See* Terry L. Anderson, *Markets and the Environment: Friends or Foes?*, 55 CASE W. RES. L. REV. 81**,** 83 (2004) (challenging a presumption of government regulation as the solution to externality problems).

88 *See, e.g.*, Demsetz, *supra* note 39, at 357 ("[T]he cost of their getting together may be enough to discourage effective market bargaining. The negotiating problem is compounded even more if the [pollution] comes not from a single smoke stack but from an in-

like runoff, these traceability concerns create an assumption that problems are sufficiently dispersed that no single, harmed, rational economic individual will have a sufficient incentive to access market or judicial control options to prevent runoff or seek damages. Additionally, no individual will have an incentive to go it alone, or be the first to blame another for harm because everyone else effected can free-ride off of their efforts. "Many individuals may be affected by the pollution, but each suffers only a small amount of damage."[89] The transaction costs to combat such pollution simply may be too high to justify private enforcement or negotiation options.[90] Whether it is an entire community's detriment or a discrete individual's, this traceability problem outprices some from using market or other private-based remedies. This statement does not necessarily advocate coercive regulation but must, at the very least, be recognized as a legitimate concern and cause for discussion about solutions.[91] In the process of evaluation, the capacity of government regulation to fill the void, which inherently involves the inefficiencies of government and the control of influential groups—from industry and environmental interests—should be a factor.[92]

Multiple contributors, difficulty in identifying sources, and difficulty in allocating responsibility for runoff pollution illustrate the complexities in creating market or judicial land use control solutions. Persons affected or societal effects in general can

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dustrial district. In such cases, it may be too costly to internalize effects through the marketplace.").

89 ANDERSON & LEAL, *supra* note 50, at 139.

90 For a discussion of the difficulties regarding information costs, see BUTLER & DRAHOZAL, *supra* note 43, at 120–21.

91 Anderson and Leal concede that the unique nature of water pollution and identification and traceability issues "may" justify regulation, but such regulation must be approached cautiously:

> [I]f the polluter is easily identifiable or if the damage is concentrated on a single individual or a small group, then there is an incentive to arrive at an optimal level of pollution. When these conditions are lacking, a regulatory solution may be called upon. Then the problem becomes one of choosing an optimal level of pollution in the political arena.

ANDERSON & LEAL, *supra* note 50, at 140.

92 Anderson and Leal explain the collective action problem, along with the potential pitfalls of a governmental regulatory solution:

> Because the costs of bringing together those who use a marine environment are often high enough to prevent joint action against polluters, a case can be made for some regulatory authority . . . to control the level of pollution. Of course, one of the problems with government control is that special interests that engage in waste disposal are just as likely—or perhaps even more likely, if they are well organized—to influence the agency as are those who suffer damages. The capture of regulatory policies by polluters is not surprising when we realize that the costs of control are concentrated on the polluter but the benefits are diffused across the population.

Id. at 139–40.

be recognized; however, substantial costs must be expended to trace sources, leading to the lack of incentives to control runoff in the marketplace. The diffuse nature of the pollution creates these collective action problems and often discourages private enforcement against harms.

As Terry Anderson and Donald Leal explain:

> [W]hen marine pollution emanates from multiple sources, separating out pollutants and tracing them to their sources can be very costly. When irrigation water carrying fertilizer and pesticides is sent downstream by a river that feeds into an estuary, for example, the problem of identifying the source becomes very costly. The damages may be obvious, but liability for them will be much less apparent.[93]

Policymakers should take into account these market difficulties, but also recognize that they are not a sole justification for regulation.

V. REGULATORY EFFICIENCY IN LIGHT OF EXTERNALITY AND TRACEABILITY PROBLEMS

Runoff, stormwater, and other sources of nonpoint source pollution have been a major focus in the contemporary development of water quality regulation. As the EPA has proclaimed, "[n]onpoint source pollution continues to be, and is increasingly recognized by the public as, the largest remaining source of water quality impairments in the nation."[94] This EPA conclusion is debatable, but so long as regulatory controls move forward based on this assumption, they should certainly be tempered by economic realities, not only as to impacts, but also as to regulatory capabilities and capacities when faced with such complexities.

As Henry Butler and Christopher Drahozal note, "[t]he existence of externalities is not, by itself, justification for government intervention to correct the externality."[95] Alternatives must be considered, with full acknowledgement that market failures may indeed require governmental intervention through regulation if a runoff problem can be proved.[96] Placing responsibilities on property owners is often argued to be justified because they may be the least cost avoider.[97]

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93 *Id.* at 140.

94 EPA, *Nonpoint Source Program and Grants Guidelines for States and Territories,* 68 Fed. Reg. 60,653, 60,653 (Oct. 23, 2003).

95 BUTLER & DRAHOZAL, *supra* note 43, at 186. *See also* Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENVTL. L. 153, 154 (1988) (arguing that long term pollution controls cannot be dependant on command and control systems of governmental regulation).

96 BUTLER & DRAHOZAL, *supra* note 43, at 121–22, 186.

97 EPSTEIN, *supra* note 1, at 279 ("The legal system thus assumes that generally the polluter has the greater ease of adjustment and control and sets its initial baseline in fa-

One alternative to regulation is the purely transactional and free market approach. This avenue again has problems due to externality and traceability problems, including related collective action, free-rider, and informational cost obstacles. As Anderson and Leal explain, pollution control from a market approach requires the ability to mechanize the property rights system to control pollution when there are efficiencies involved in the identification of liabilities:

> A truly free market approach to pollution control would require polluters and recipients of the discharge to bargain over the level of the pollution. . . . Of course, an exchange of property rights or payments for damages both require well-defined and enforced property rights.[98]

Nonetheless, we should not adopt an assumption that regulation is the only or necessarily preferable solution to these difficulties—even in light of the economic realities and obstacles identified in this article. Anderson and Leal continue that property rights and their clear identification might solve some of these problems:

> It is useful to reiterate the importance of the evolution of property rights and the common law. As clean water and air become more valuable, entrepreneurs have a greater incentive to define and enforce rights to the resources. If we continue to subsidize the use of these resources and to subsidize the costs of disposal, however, entrepreneurs will not be getting the right signals. . . .
>
> There is no guarantee that property rights will evolve, but we should not stand in the way of environmental entrepreneurs who try to develop them.[99]

When there is a presumption in favor of regulation, society may foreclose more entrepreneurial and innovative marketplace solutions to issues such as runoff.

VI. CONCLUSION

As previously noted, the purpose of this article is not to propose solutions to runoff problems, but to identify some of the appropriate metrics that should play a part in formulating legal rules for runoff controls. We cannot escape the reality that controlling runoff, if desired or necessary for water quality, may require regulation. But, in formulating rules, we must determine whether it is reasonable to expect that we can overcome practicable obstacles.

When it comes to perceived or identified environmental ex-

vor of the right of all people to be let alone.").

98 ANDERSON & LEAL, *supra* note 50, at 147.

99 *Id.* at 150.

ternalities, there is often a presumption in favor of regulation. There is a presumption of market failure. When we know that externalities may be imposed, concomitantly that costs may not be internalized, there is a reflexive tendency to move toward governmental intervention. However, regulators should not presume that command and control solutions—even in light of such difficulties—will be more effective or more efficient.[100] "The mere fact that pollution causes physical harm does not mean that it necessarily constitutes some legal wrong,"[101] and the mere existence of regulatory options to attempt to control potential pollution does not necessarily mean that it should be exercised.

Economic realities can justify coercive regulation *or* nonregulation. The primary purpose of this article is to stress that, when making that choice, economic realities cannot be ignored—in either direction. Property rights and the imposition of governmental regulations exist to advance and reflect human values[102] and societal priorities—true enough. However, the complexities involved in determining legal rules cannot lose sight of the economic consequences and capacities of the legal system to deal with these problems.

100 Dukeminier and Krier provide a good summary for this article's thesis and purpose—that economic difficulties for controlling runoff may be difficult**,** but such difficulties do not create a presumption for government regulation:

> Don't assume that government regulation is a magic solution to resource mismanagement. The government can fail just as the market can, particularly when the costs of regulation would fall on small, intensely interested groups, and the benefits would flow to the public at large and to future generations.

DUKEMINIER & KRIER, *supra* note 39, at 55 n.31.

101 EPSTEIN, *supra* note 1, at 277.

102 *See* State v. Shack, 277 A.2d. 369**,** 372 (N.J. 1971).