

LAWS GOVERNING FRESHWATER AND GROUND WATER POLLUTION

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Keywords: water pollution, groundwater pollution, Clean Water Act, Fisheries Act, Arctic Water Pollution Prevention Act, Canada Water Act, Rivers and Harbors Act of 1899, point source pollution, non-point source pollution, Resources Conservation and Recovery Act, water quality standards, water quality guidelines, water quality objectives, total daily maximum load, Comprehensive Environmental Response, Compensation and Liability Act.

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Summary

Both industrialized and developing countries have incentives to adopt, implement, and enforce laws that address freshwater and groundwater pollution. Water in industrialized countries can be contaminated from discharges of toxic and other pollutants from factories, as well as from a wide variety of so-called “non-point source” pollutants. Ground and surface water sources in under-developed and developing countries may be contaminated by untreated sewage and livestock wastes. Moreover, water sources in developing countries increasingly face risks from industrial discharges from new factories. Water pollution controls date back at least six centuries, but countries

continue to struggle with legislation to protect critical water sources from pollution. Because surface and groundwater pollution derives from a wide array of difficult to control sources, even countries with sophisticated water pollution control laws continue to search for more effective legal methods to protect water resources. This article will outline general themes in and describe major approaches to water pollution control law using examples from the United States and other countries.

1. Introduction

Industrialized and developing countries alike have strong incentives to adopt, implement and enforce laws to address freshwater and groundwater pollution. Clean water from surface water (rivers and lakes), groundwater aquifers or both, is essential for domestic, agricultural, industrial, ecological and other uses. All countries, however, face significant threats to these water supplies from various pollution sources. Water in industrialized countries can be contaminated from discharges of toxic and other pollutants from factories, as well as from more traditional pollution sources including discharges from domestic sewage treatment plants, storm water runoff from urbanized areas, and polluted runoff from agriculture, silviculture, mining, construction and other so-called “non-point source” pollution. Water sources in under-developed and developing countries often face more basic public health threats, such as contamination of surface and ground water from raw (untreated) sewage and livestock wastes. Developing countries, however, increasingly face risks from industrial discharges from new factories, especially absent legal and institutional mechanisms to require modern pollution controls. Thus, one of the largest challenges in water pollution control law is addressing pollution from such a large number and diversity of pollution sources.

Laws governing freshwater pollution date back at least six centuries. An early English statute prohibited “the throwing of dung, filth, garbage, etc. into ditches, rivers or other waters and places within, about or nigh to any cities, borough or towns under penalty.” Early statutes in the United States, such as the Rivers and Harbors Act of 1899, included blanket prohibition on the release of wastes into navigable waters without permission from the government. Basic legal principles from these early enactments continue in many modern legal regimes. Yet countries continue to struggle with appropriate legislation to protect critical water resources from pollution that impairs their use for human consumption and ecological protection. Moreover, these early laws mainly addressed direct discharges of wastes into waterways. With the realization that surface and groundwater pollution derives from a much wider array of sources, many of which are more difficult to control than discharges from point sources, even countries with the most longstanding and sophisticated water pollution control laws continue to search for better legal methods to protect water resources.

Existing laws governing freshwater and groundwater pollution are voluminous and diverse, and cannot be identified much less described in full in a work of this length. This article will instead outline the general themes in the area, and describe the major approaches in somewhat greater detail. Attention will be given to both the theory and practices employed under each approach, and to the relative strengths and weaknesses that each has to offer. Principle reliance is placed on U.S. water pollution control law, but examples from other countries are used as well.

2. General Themes in Water Pollution Control Law

Defining “Pollution”

An important threshold question is what is meant by the term “pollution”. The breadth of the definition will dictate the scope of environmental problems covered, and the range of existing legal approaches considered.

In its narrowest but most common usage, “pollution” refers to the contamination of water by chemical, biological or other harmful substances. This would include, for example, contamination of water by pathogens from human and animal waste, discharges of chemical wastes from factories, and other sources of impurities such as agricultural fertilizers and pesticides.

Some water pollution laws, however, view the concept much more broadly. For example, the U.S. Clean Water Act defines pollution as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water”. This broad definition goes along with the stated purpose of the law, which is to “restore and maintain the chemical, physical and biological integrity of the Nation’s waters”. In particular, this concept is distinguished from the definition of the “discharge of pollutant,” which means “any addition of any pollutant to [waters] from any point source...” This latter definition parallels the narrower, more common view of water pollution. The broader term, “pollution”, encompasses changes in the physical and hydrological structure of water systems, and in biological habitats and communities. For example, it would include changes in stream morphology caused by channelization; the impoundment or other modification of waterways by dams or other structures; the alteration or elimination of riparian habitat; and the filling or other alteration of wetlands. Indeed, the U.S. Supreme Court recently cited the breadth of this definition to uphold a state’s assertion of authority to regulate water *quantity*, as opposed to water *quality*, under its water quality standards.

Viewing water pollution in this broader sense, however, would implicate an even larger array of laws than are possible to catalog here. In the USA, for example, it would logically bring into play the Endangered Species Act, which governs the biological integrity of aquatic ecosystems in various ways, as well as other fish and wildlife protection statutes. Therefore, with a few important exceptions that will be noted as appropriate, the remainder of this article will deal largely with laws governing water contamination.

3. Major Legal Approaches to Water Pollution

There are a number of overlapping ways in which water pollution control law can be subdivided into logical categories. First, common law approaches, i.e. law created through gradual accumulation of judicial decisions in individual cases which set malleable precedents for future cases and conduct, can be distinguished from water pollution control statutes enacted by legislative bodies. However, the legal principles established in England and USA continue to influence the ways in which modern environmental statutes are written and applied.

Second, laws governing liability for past harm can be distinguished from laws governing current and future conduct. In the former, entities responsible for past or ongoing water pollution that causes harm to other water users are required to pay compensation, usually in the form of monetary damages, for the proven harm. In the latter, entities engaged in conduct that causes or may cause water pollution are required to change their practices in some way to reduce or eliminate the resulting harm. Examples of both types of remedy can be found both in the common law and in statutory regimes.

Third, some types of water pollution law focus on the activities of individual sources of water pollution, while others attempt to define the desired level of ambient environmental quality, and to ensure that aggregate pollution sources do not cause violations of those standards. Some systems combine both theories of control. The resulting obligations imposed on individual pollution sources, and the distribution of both the costs and benefits of pollution control, can vary dramatically depending on the form of control chosen.

Finally, water pollution control laws can be distinguished on the mechanism or combination of mechanisms used to change conduct that causes water pollution. Some systems rely on blanket prohibitions on certain forms of conduct, such as the release into water sources of particularly harmful substances, or substances in quantities that cause prescribed forms of harm. Others rely on permitting mechanisms under which discharges are prohibited except pursuant to a government-issued permit which delineates the amount, timing, and other conditions of permissible releases. Particularly with respect to groundwater contamination, some laws established citing and design standards that dictate the location and manner in which certain polluting activities, such as landfills, can be built and operated. More broadly, land use controls can be imposed through comprehensive planning and other mechanisms to prevent the placement of polluting activities in areas that might cause surface or groundwater pollution, or that prevent land development at densities that would result in such pollution. Such regulatory methods can be enforced through administrative, civil or criminal fines or other sanctions, as well as injunctions or other types of mandatory relief.

Some systems rely on economic principles as opposed to command-and-control regulation. This includes liability for harm to other users, under the assumption that rational market participants will modify their conduct in an economically-efficient manner to the point where the cost of controlling pollution equals the amount of damages paid. However, it can also include more active government intervention in the form of effluent fees or pollution taxes indexed to the amount or some measure of harm of pollution released, under which entities are provided an economic incentive to reduce pollution. As with the liability regime, in such systems rational entities will reduce their pollution to the point where control costs equal the amount of fees or taxes assessed. Some systems use the reverse form of economic incentives, in the form of subsidies or government funding for pollution control costs.

Lastly, some systems rely on ethical dictates and other persuasive mechanisms, such as education and information-sharing, to induce voluntary changes in behavior designed to reduce pollution. Communication approaches to pollution control attempt to appeal to

the ethical sensibilities of people and businesses in a position to choose among practices that cause varying levels of pollution. Communication approaches—as opposed to enforceable mandates—are not limited to traditional societies. They are also used—albeit with varying degrees of success—in large industrial economies where political support for regulatory or other approaches is lacking, or where it is perceived that enforceable regulations are not practicable due to the nature, magnitude, or diversity of conduct involved.

These general themes in water pollution control law transcend many of the specific types of water pollution control law described below. Many systems employ different combinations of these general approaches either to reflect the complexity of the problem to be addressed, or as alternative, parallel approaches to ensure comprehensive coverage and effectiveness.

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Biographical Sketch

Robert Adler, James I. Farr Chair in Law, received a B.A. from Johns Hopkins University (1977) and a J.D. from Georgetown University Law Center (1980), where he graduated cum laude and served as Editor-in-chief of *Law and Policy in International Business Journal*. He was assistant counsel to the Pennsylvania Department of Environmental Resources and was active in the Three Mile Island litigation. From 1984 to 1987, Professor Adler was staff attorney and executive director of Trustees for Alaska, and then went to the Natural Resources Defense Council as a senior attorney and director of the Clean Water Project. His scholarship includes *The Clean Water Act: Twenty Years Later* and *Toward Comprehensive Watershed-based Restoration and Protection for Great Salt Lake*. Adler is currently at work on a book about the legal issues surrounding Lake Powell and Glen Canyon Dam. He has published articles in the *Vanderbilt Law Review*, *Harvard Environmental Law Review*, *Utah Law Review*, *George Washington Law Review*, *Environmental Law*, and numerous other law, policy, and science journals. Before joining the University of Utah in 1994, Adler taught an environmental practice seminar at the University of Virginia School of Law.

He was honored in 2002 with the Pfeifferhorn Conservation Leadership Award, given annually by a coalition of state environmental organizations, in recognition of his efforts to preserve Utah's natural resources.