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GROUNDWATER ISSUES AND CONFLICTS: THE DECADE AHEAD

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The fundamental causes of water quality problems lie in seemingly unrelated aspects of life: how we live, the way we farm, produce and consume, transport people and goods, and plan for the future. Many aspects of modern life and past practices put pressure on water quality. Until recently, these activities proceeded with little recognition of the effects they had on surface water, groundwater, and aquatic habitats.

Typically, individuals and society make choices that reflect values specific to farming, producing, consuming, or working—but not necessarily to achieving clean water or healthy ecosystems. Sometimes these values conflict with clean water goals. Until very recently, conflicts remained largely unrecognized, at least until water quality problems became so apparent that the public demanded action. Historically, such conflicts were resolved through relatively narrow legislation to restore and protect water quality by altering the direct sources of impairment but not necessarily the root causes of declining water resource quality. **Even today, when we are beginning to recognize some of the basic conflicts between human activities and environmental quality, few contemporary solutions address the basic economic and social forces at the root of water problems.**[2]

If there is any single characteristic that will define groundwater issues and conflicts in the decade ahead, it is the growing recognition that such issues and conflicts are a function of "basic economic and social forces." Addressing them will

require a clear understanding of the social and economic milieu within which they arose. It is unlikely that any attempt to resolve such issues and conflicts would be successful if it did not recognize the "interconnectedness" of the social, cultural, economic, technical and ethical forces that have produced them.

In essence, resolving groundwater issues and conflicts requires an "ecological" approach to policy. This is an approach that recognizes the interconnections and interdependencies that have created issues and conflicts and that must be utilized to resolve them. Currently, the emergence of this approach can been seen in at least six areas:

- prevention of groundwater contamination
- remediation of existing groundwater contamination
- compensation for individuals harmed by groundwater contamination
- legislative issues
- educational requirements
- environmental ethics

Prevention of Groundwater Contamination

The Clean Water Act's (CWA)[3] stated goal was zero discharge of pollutants. This goal focused on what came out of the pipe, not what went into it. The decade ahead will see a much greater focus on pollution prevention. This is especially true regarding groundwater because it is much easier to prevent contamination of the resource than it is to restore the resource.

The wellhead protection area programs authorized by § 205 of the Safe Drinking Water Act Amendments of 1986[4] reflect this approach. Under § 205, state and local governments are authorized to develop plans to protect groundwater recharge areas. Once the plans are approved by the Environmental Protection Agency (EPA), all activities within the recharge area (including activities by the federal government) must be consistent with the protection plan.

In essence, these plans may include land use plans for lands located within the recharge area. This is one example of the interconnectedness of groundwater issues: Land uses have a direct impact on groundwater quality.[5] This recognition has prompted the EPA to propose regulations regarding the land disposal of toxic sludge from wastewater treatment facilities. In part, the intent is to prevent the treatment of surface water from contaminating groundwater.[6]

Another example of such an approach is the proposed Waste Reduction Act, H.R. 1457. The intent of this act is to shift national policy from waste disposal to waste elimination and recycling. This would be accomplished by new technology, by changes in processes and procedures, by substitution of materials, by inventory control and by improved maintenance and training. Businesses would be eligible for matching grants to implement new methods and procedures for eliminating waste or implementing recycling.[7]

Waste reduction and recycling, according the EPA Administrator William Reilly, is one of President Bush's funding priorities. Funding for programs intended to prevent groundwater contamination will be critical. Despite the assurances of Administrator Reilly, however, it is likely that most funding will have to come from the states.

Another example of the interconnectedness of the groundwater issues relates to funding. Revisions in federal law that placed limitations on tax-exempt bonds had the effect of limiting the amount of money available to local governments for water and wastewater treatment facilities. Given the size and scope of the federal deficit, it is unlikely that federal law will be changed in the near future. Absent such a change, however, it is equally unlikely that advanced wastewater treatment facilities will be constructed in many areas. The result may be continued contamination of both surface water and groundwater.

The Clean Water Act will expire in 1992. Amendments to the CWA to be considered in the reauthorization process reflect a reorientation from pollution treatment to pollution prevention. Proposed amendments to the CWA would require both water conservation and changes in manufacturing processes to prevent water pollution. EPA Administrator Reilly has indicated that the EPA will advocate biomonitoring (as opposed to the current use of chemical concentrations to determine water quality) and may mandate water recycling to meet water quality goals. An approach to water management based on watershed boundaries has also been advocated by Reilly as has a national water quality monitoring system. Many of these

provisions are likely to be included in the CWA when it is reauthorized and will shape federal law for the decade ahead.

Remediation of Existing Groundwater Contamination

The closer an aquifer is to the surface of the land, the more likely it is to be contaminated. EPA recently surveyed 124,000 shallow aquifer wells. Nearly 25,000 of these wells showed nitrate contamination from fertilizers, septic systems and animal wastes. Approximately 20 percent of all groundwater samples tested by EPA from all aquifers have shown contamination by man-made chemicals.

A major issue for the decade ahead is financial responsibility for groundwater contamination. In essence, who pays for the cleanup? In theory, the party responsible for the contamination is responsible for the cost of remediation. This assumes both that the responsible party can be determined and that the responsible party is not judgment proof. In fact, if a drinking water supply has been contaminated, it is frequently the consumer who must pay either to clean-up the water supply or for an alternative water supply.

With regard to financial responsibility, two proposals that reflect the interconnectedness of groundwater contamination issues may be considered when the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)[8] is considered for reauthorization in 1991. The first, a waste-end tax, would be assessed when hazardous substances regulated under the Resource Conservation and Recovery Act (RCRA)[9] are received at hazardous waste facilities.[10] The second proposal calls for the establishment of a National Environmental Trust Fund which would be capitalized by a 2 percent fee on commercial and industrial insurance premiums. Either the tax or the Trust Fund (or both) would be utilized to pay for remediation. Because of state requirements and federal funding limitations, it is quite likely that similar programs will emerge in the states.

Compensation for Individuals Harmed by Groundwater Contamination

Historically, individuals harmed by groundwater contamination initiated litigation seeking damages against the responsible party. While a boon to the legal profession, such litigation is expensive, time-consuming and provides relief (if any) only to the prevailing party.

The decade ahead will see the emergence of alternative means by which individuals harmed by groundwater contamination might be compensated. For example, the State of Minnesota, with the enactment of the Minnesota Environmental Response and Liability Act (MERLA)[11] established a state fund to compensate victims of environmental degradation. The state fund, which has yet to be used extensively, is intended to function as an insurance program.

Similar programs are sure to emerge in the coming years. Such programs may be funded from the same revenue sources discussed in the preceding section.

Legislative Issues

There is a hodge-podge of federal legislation affecting groundwater quality.[12] These laws were enacted at different times and with different purposes.

The result is a series of redundancies, duplications, inconsistencies and vacancies. Certain groundwater quality issues are addressed in several statutes, other issues are not addressed at all.

The decade ahead will see a concerted effort at the federal level to create a comprehensive and consistent approach to environmental protection including, of course, groundwater quality protection. Existing laws will be either rewritten or supplemented. It is likely that this will occur in the context of reauthorization and may begin with the reauthorization of the CWA.

A similar approach may also emerge at the state level for those issues historically within state jurisdiction. State water quantity laws and land use

issues that affect groundwater quality must be addressed at the state level. Should the state and local governments fail to act, the federal government undoubtedly will. The issue for the decade ahead, in essence, is not if groundwater quality will be protected. The issue is which branch of government will retain primary responsibility to provide that protection.

Educational Requirements

Another area in which the interconnectedness of groundwater issues and conflicts can be seen is in education. If the goal is to protect the quality of groundwater, one requirement is public education. People need to know, and must be taught, how their activities affect the environment generally, and groundwater quality specifically.

Furthermore, the decade ahead will see a serious shortage of specialists trained to handle environmental issues. This is especially true with regard to environmental engineering and environmental management. The Water Pollution Control Federation, for example, estimates that 40 percent of today's chemists and engineers will be eligible for retirement within five years.

New educational programs that focus on the interconnectedness of environmental issues are developing nationwide. That development will (and must) continue in the decade ahead. At least forty colleges and universities now have graduate programs in environmental studies. One of those programs, a graduate program in Water Resources Administration, has been established at the University of New Mexico. Those individuals who had the foresight to establish the Water Resources Administration program at UNM are to be commended.

Environmental Ethics

One of the more interesting aspects of the decade ahead will be the growing involvement of the theological and ethical communities in environmental issues. By the new millennium, this annual water conference may be attended by as many ministers and theologians as it is now attended by lawyers and engineers.

New organizations are emerging.[13] New books are being written.[14] Even the mainline denominations are becoming involved with environmental issues.[15]

While it is difficult to anticipate all that will occur in the decade ahead regarding environmental ethics, some things will certainly occur. Genesis 1:26-29, for example, may require reinterpretation. It is simply not possible for one species to survive if it attempts to exercise "dominion" over all other species in a shared biosphere.

Our perception of time is likely to change. In Washington, D.C., it is difficult to find a planning horizon in excess of eighteen months because that is the maximum amount of time available between one Congressional election and the beginning of the campaign period for the next Congressional election. There are Native American beliefs, however, that mandate planning for the seventh generation into the future. Human impacts on the environment, the capability of the environment to accommodate such impacts and the need to prevent those impacts must be understood within a proper time frame. The acceptance of a short-term gain for a long-term cost, implicit in the suggestion that environmental protection must be balanced against economic growth, is unacceptable because it does not reflect an appropriate time frame.

With a realistic perception of time will come a realistic perception of responsibility. In the decade ahead, short-term gain, irrespective of long-term cost, will be seen as irresponsible. Our perspective will change from what we have inherited from our parents to what we will leave for our children.

It is even possible that our concept of God will change. New Testament theology is based in part on the writings of the Apostle Paul whose beliefs reflected the beliefs of the Greeks regarding the duality of human nature. This duality suggested that humanity was both very-God (reflected in human intellect; to be praised and developed) and very-man (reflected in human nature; to be rejected or suppressed).[16] The result, in simple terms, was the removal of nature from our conception of God. We came to believe in a God of history, a God "out there" or within individuals, but not in a God within nature.

That perception is being challenged and may change in the decade (or decades) ahead. If life

on a shared planet is to be sustained, it is essential that forests be perceived as a manifestation of God's presence rather than as board-feet of lumber, that rivers be seen as a manifestation of God's grace rather than as acre-feet of water.

Conclusion

One of the primary objectives of the Clean Water Act was to restore and maintain the chemical, physical and biological integrity of the nation's groundwater. Unfortunately, as a nation, we have not achieved that objective.

One other certainty about the decade ahead is that all of us gathered here today will share the responsibility to achieve the objectives of the Clean Water Act. Simply stated, the alternatives are unacceptable.

Endnotes

[1]Of Counsel, Will & Muys, P.C., 1015 18th Street N.W., Suite 600, Washington, DC 20036 and member of the Associate Faculty, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA. THE OPINIONS EXPRESSED HEREIN ARE STRICTLY THOSE OF THE AUTHOR AND MAY NOT REFLECT THE OFFICIAL POSITION OF THE COLLEGE OF WILLIAM AND MARY.

[2]Water Pollution Control Federation, *Water Quality 2000 Phase II Report: Problem Identification* 19 (draft, 1990) (emphasis added).

[3]33 USC §§ 1251 et seq.

[4]42 USC § 300h-7.

[5]This is especially true with regard to agriculture, the largest single source of groundwater contamination.

[6]A possibly apocryphal story regarding the proposed EPA toxicity regulations for land disposal of sludge concerns the Blue Plains sewage treatment facility in Washington, D.C. According to the story, the proposed EPA regulations would limit the land disposal of sludge from Blue Plains to a thickness of approximately 1/2" per year. This limitation, it is said, would result in an annual requirement for an area approximately the size of the state of Texas for the land disposal of Blue Plains sludge.

[7]H.R. 1457 was passed by the House of Representatives on June 26, 1990. No action has been taken in the Senate.

[8]42 USC §§ 9601 et seq.

[9]42 USC §§ 6901 et seq.

[10]In addition to raising revenues, such a tax could have the effect of discouraging the generation of hazardous wastes. Conversely, it could also encourage the illegal disposal of hazardous wastes at unauthorized or unlicensed waste facilities.

[11]Minn. Stat. Chap. 115B.01 et seq.

[12]To the list of those laws already mentioned must be added the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), 7 USC §§ 136 et seq., and the Superfund Amendments and Reauthorization Act (SARA), 29 USC § 655, 42 USC §§ 9601, 9611, 9671-9675.

[13]For example, the North American Conference on Religion and Ecology in Washington, D.C.

[14]For example, *The Dream of the Earth* by Thomas Berry.

[15]For example, the Presbyterian Church has established an Eco-Justice Task Force, the papers of which have been published as *While the Earth Remains* (Lancaster, ed., 1990).

[16]It has been argued, for example, that the concept of "original sin" in Catholic theology is predicated on the belief that what is natural, is sinful.