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review*

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## A Survey of the Groundwater Act of 1989

The 1989 Groundwater Act was a major piece of environmental legislation. This information brief summarizes the results of a survey of ten individuals who worked on the development and implementation of the act. The summary includes:

- **Accomplishments stemming from the act**
- **Unfulfilled goals of the act**
- **Future groundwater concerns and recommendations**

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## Introduction

The 1989 Groundwater Act was a major piece of environmental legislation in Minnesota. All of the primary environmental agencies played a part in it, as well as a variety of other entities (the University of Minnesota, state Geological Survey, League of Cities, Association of Counties, Association of Townships, watershed districts, soil and water conservation districts, and assorted farm, environmental, and business groups).

The law (Laws 1989, ch. 326) contained ten separate articles, containing changes and additions for groundwater law. The bill had a bipartisan authorship in the Minnesota House, with each author responsible for two or more articles (three of the five House authors still serve in the legislature). The law contained numerous policy and funding provisions, but, generally, the following major goals were met:

- 1) Stronger water conservation efforts were put in place and promoted by state agencies.
- 2) Conversion, and a timetable, of once-through cooling systems to use water more efficiently in large buildings was accomplished.
- 3) New or increased water use fees were added to reflect the cost of the resource use.
- 4) Greater monitoring and testing of pollutants was required as they move through groundwater.
- 5) Waste pesticide container cleanup and collection addressed in agricultural regions.
- 6) Stronger emphasis to provide wellhead protection.
- 7) Water planning grants increased for local governments.
- 8) Emphasis for better cooperation and coordination among state agencies with groundwater responsibilities.
- 9) Legislative monitoring and encouragement, through the Legislative Water Commission, for implementation of the various groundwater act provisions.

## Evolution of the Act

Issues affecting the quality and quantity of groundwater were becoming increasingly known during the 1980s. Drought conditions in the last half of the decade showed the importance of having adequate groundwater supplies. Earlier well testing showed that pesticides had been found in almost 40 percent of various wells tested in sensitive groundwater areas. Nitrate levels

in the same studies exceeded health limits in over 40 percent of the private wells and 7 percent of the public wells tested.

Leaking solid waste landfills, concern over siting of a possible hazardous waste facility, attention to leaking underground petroleum and oil storage tanks, radioactive waste disposal issues, and the increased knowledge of nonpoint pollution sources and the interface of surface and groundwater resources all came into the forefront during the 1980s. Related laws were enacted by the legislature at the time, including restricting certain pesticide use, cleaning up land pollution, local water management encouraging comprehensive planning of water resources, and funding for a clean water partnership between state and local units of government to curtail nonpoint pollution.

Agencies conducted various joint studies of groundwater problems, the governor appointed advisory committees to study the issue, and legislative committees were conducting their own hearings. It became apparent that only a comprehensive water resources protection effort, emphasizing the groundwater concern, that involved both state and local government units could make a major difference.

The executive branch developed strategies, which were reviewed by the legislative branch. Goals included:

- 1) Clarifying the statutory framework to add groundwater protection to the legal framework that had emphasized surface water concerns;
- 2) Using an approach which recognized that education, research, monitoring, incentives (financial and technical), and regulation were all necessary and complementary in order to achieve the desired results;
- 3) Enhanced testing of the public water supply and adequate new well construction;
- 4) Better management of pesticides and nutrients; and
- 5) Boosting water protection programs at the local level of government.

## **Why a Survey**

After the Groundwater Act passed, rules needed to be promulgated, programs had to undergo development, and further studies and research had to be conducted. The law was viewed as a very strong state effort and accolades were received nationwide. Minnesotans were called to Congress to testify on the provisions, the law received various innovation awards, and it was recognized by some organizations as a model comprehensive groundwater law.

The Legislative Water Commission, consisting of five House and five Senate members, monitored the progress of the act and its implementation by the affected state agencies. However, the commission was abolished in 1995 as a cost-cutting measure.

As groundwater concerns never go away, and new ones spring up (aggregate material quarry operations, etc.), the author of this information brief thought that it would be useful to take a ten-year retrospective look at the Groundwater Act, in light of what it has accomplished and what continuing and new groundwater concerns are still prominent. Work started in the fall of 1999, continued past the 2000 session, and into the 2000 interim. At the same time, a new House Environment and Natural Resources Policy Subcommittee on Groundwater was formed to look at evolving issues.

The subcommittee met four times in 2000 and was provided with a wide variety of groundwater information and possible quality and quantity issues. Two concerns that were apparent are that 90 percent of the state public water supply systems are drawn from groundwater sources, and 75 percent of the state citizens obtain their domestic drinking water from groundwater supplies. By 2020, the state population is expected to increase by 20 percent, causing a possible 10 percent increase in groundwater consumption.

## Groundwater Act Survey Responses

### I. Accomplishments Stemming from the 1989 Groundwater Act

#### A. Department of Natural Resources (DNR)

- State **protection of geologically sensitive areas** has been incorporated into rules and programs at the Departments of Agriculture, Health, Pollution Control Agency, and others; use of the methodologies described in a DNR report on the subject has saved money and helped prioritize areas for wellhead protection.
- **Mapping of sensitive areas** is now an integral part of the mapping efforts carried out in collaboration with the Minnesota Geological Survey.
- There are now 11 **hydrogeologic atlases completed** (six were done in 1989) and there have been three regional hydrogeologic assessments completed (newly established by the 1989 act). The geologic and hydrologic mapping provide the basic information needed to produce the interpretive map showing geologic sensitivity to pollution.
- **Once-through cooling systems** using greater than five million gallons annually from a groundwater source are no longer allowed.
- The DNR has implemented a new schedule of **water use fees**.

- The DNR completed and published a **consumptive water use study** with particular emphasis on once-through cooling.
- Funds and a position were established to restore and **maintain stream gages** that had been dropped by federal agencies due to budget constraints.
- **Staff expertise** in geophysics, observation wells, and groundwater hydrology was added to the DNR Waters complement.

#### B. Board of Water and Soil Resources (BOWSR)

- Establishment of the Local Water Resources Protection and Management Program has resulted in state-approved and **locally adopted local water management plans** in all 80 greater Minnesota counties and groundwater plans in five of the seven metropolitan counties.
- Periodic **revision and implementation of these plans** continue with financial support (approximately \$2.535 million/year) from the state through both noncompetitive base grants to counties and competitive challenge grants, established as part of the act.
- Many implementation actions are being directed towards groundwater issues, including progress by local units to begin **inspection of individual on-site treatment systems**.
- The act directed BOWSR, in consultation with other agencies, to select counties to receive grant moneys for well sealing and to establish **priorities for well sealing**. Grants were used to share with landowners the cost of sealing high-priority unused wells.
- Approximately 40 counties continue to share in the cost of **sealing unused high-priority wells** through the comprehensive local water planning program. As of 1996 an estimated more than 4,700 priority wells have been sealed.
- The act established the **Metropolitan Local Water Management Task Force**. The mission of this 22-member task force was to evaluate the status and effectiveness of local water planning and management activities in the seven-county metropolitan areas.

#### C. Department of Health

- When the Groundwater Protection Act (GWPA) was passed, the department estimated that no more than approximately 65 percent of newly constructed wells

complied fully with state construction standards. All **newly constructed wells** now comply fully with all state construction standards.

- The GWPA required that **sellers of property** disclose the existence of all known wells.
- Under this program, more than **125,000 abandoned wells** have now been permanently **sealed** by licensed well contractors.
- **Health Risk Limits** (HRLs) for many groundwater contaminants have been developed and implemented through the rulemaking process.
- Expanded the **monitoring of community water supplies** with about 20,000 tests for contaminants in 1991, jumping to 66,441 in 1997. The types of pollutants tested also increased from about 25 to 118 pesticides, industrial contaminants, bacteria, nitrate, and inorganic chemicals.

#### D. Pollution Control Agency (PCA)

- Responsibilities and funding for programs within the PCA included development of **Best Management Practices** (BMPs) to address the effects of changing land use on groundwater quality, and development and implementation of the **Integrated Groundwater Information System** (IGWIS), a comprehensive database of groundwater quality information around sites permitted, inspected, and monitored by PCA.
- The emergence of the Internet during the 1990s as a means for agencies to post their databases relating to water quality and quantity has changed the focus of data integration efforts from developing one centralized database for the state to finding ways to efficiently and **seamlessly link databases** maintained by individual agencies.
- Several important **studies of contaminants** in groundwater such as nitrogen, volatile organic compounds, and arsenic, have been completed by several of the water agencies.
- Groundwater education programs have become an increasing part of **K-12 curricula**.

#### E. Department of Agriculture (MDA)

- One of the most important accomplishments of the Groundwater Protection Act was the **statement of legislative intent and the establishment of a goal** in Minnesota Statutes, chapter 103. This presented an overall guidance for the state agencies and the citizens of Minnesota.

- In addition, definitions were provided that clearly assigned the MDA **responsibilities for agricultural chemicals** (fertilizers and pesticides). A number of the programs assigned to the MDA were innovative and “first of a kind.”
- Funded by a **surcharge on pesticides and fertilizers**, the Agricultural Chemical Response and Reimbursement Account was the funding mechanism for reimbursement cleanup and many agricultural spills that had inadvertently occurred at agricultural chemical facilities in small towns throughout the state. As of 1999, over \$10 million has been reimbursed for over 460 applications by the ACCRA Board.
- The MDA was also provided equal and direct **access to MERLA (superfund) funds** for administrative costs, emergencies, orphan sites, or sites with recalcitrant responsible parties.
- **Waste pesticides collections** are made available to citizens in each county at least once every two years. Funded by pesticide registration fees, approximately 1.7 million pounds have been collected and properly disposed of through this program.
- **Best management practices** were defined and practices were adopted for nitrogen fertilizer and pesticides.
- In cooperation with local units of government and the agricultural industry, **empty pesticide container collection programs** were established and have largely become routine in counties throughout Minnesota.
- Formal **education and licensing efforts** were greatly increased by the MDA as a result of the Groundwater Protection Act.
- **Adequate information** regarding the impact of pesticides and fertilizers on groundwater was disputed, unknown, or relatively nonexistent prior to the act. Since that time information from many sources is readily available, discussed, and accepted.
- **Integrated Pest Management** on state-owned lands and, as a best management practice, has been promoted and is commonly practiced.
- A program at the MDA was developed and implemented that has been well received and successful in the **prevention of anhydrous ammonia releases** and anhydrous ammonia safety.
- The promotion and demonstration of **sustainable agricultural practices** was addressed by the act.

## F. Miscellaneous

- The 1989 act eliminated some types of **Mount Simon Hinckley aquifer use**, and subsequently other steps have been taken to promote water conservation.
- The act made local **water planning grants** routine.
- It provided a consistent funding source for **pesticide compliance monitoring**.

## II. Unfulfilled Goals of the Act

### A. Management

- It may not be appropriate to **mandate specific criteria** as applicable to all groundwater sites; criteria, instead, need to be selected to address the specific issues of concern.
- There are still **joint powers watershed management organizations** within the seven-county metropolitan area, which are not functioning as prescribed by the Metropolitan Surface Water Management Act. The main problems with these joint powers entities are their inability to respond to major environmental pressures and/or problems, lack of financing, and lack of oversight of member cities and towns.
- Presently there is a disconnect between surface water, groundwater, and land-use in the current **water management system**. This is aggravated by the lack of local educational and technical assistance available through the existing local water planning, soil and water conservation district, and Minnesota Extension delivery system.
- **Nitrogen in groundwater** continues to be a major issue as land use changes and an increasing state population continues to demand more high-quality groundwater. Nitrate is being studied by several agencies, yet there is no trend information even on nitrate in groundwater.
- **Overapplication of pesticides and fertilizers**, or failure to properly account for nutrient loading as a part of manure application, remains a concern in some areas.
- Research on best management practices, groundwater protection, and agricultural practices has been limited. Without **research and technology transfer**, little progress can be made. There is technology available that could be utilized to help farmers with economic and environmental goals, but there is inadequate research to determine and promote the environmental benefits of those tools.



- Basic information is lacking about Minnesota's aquifers. There is no **systematic approach** to understanding groundwater quality and quantity trends in Minnesota. While there are many program efforts and much monitoring, no agency has taken the lead to provide water quality trends for Minnesota's aquifers.
- While DNR tracks water use, it does not **analyze the information** and tie use to particular aquifers or even surface water sources. There is a need to systematically develop yield information.
- There needs to be a **comprehensive monitoring strategy** that provides a comprehensive picture of groundwater quality trends, but also meets program needs of the agencies. Private wells supply about 25 percent of the population and there is no systematic monitoring of these wells.
- **Too many agencies** are involved and no agency is in charge. There is a lack of leadership and vision.
- There is a need to ensure the agencies focus on the **resource as a whole** rather than the programs.

## B. Planning

- Although counties may be the **appropriate level for groundwater planning** there continues to be a very poor link between county level plans and the actions of other local units of government.
- The **groundwater quality monitoring database** envisioned at the State Planning Agency has not been fully realized because of a lack of resources to support it.
- **Basic data gathering** and information. Minnesota still has basic data needs that are unmet. This includes basic information on the groundwater resources, the geology of Minnesota, and monitoring of water quality parameters, pesticide use information, water quality trend information, management practices, etc.

## C. Funding

- Not enough funding has been put forth to meet the need for **information and education**.
- Funding for programs that directly and indirectly **protect water resources** of the state have largely decreased since 1989.

- **Water Quality Trend Measurements** are expensive to generate and dependent on stable funding sources. Inadequate funding exists for the collection of long-term data.

### III. Future Groundwater Concerns and Recommendations

#### A. Management

- The issue of **groundwater sustainability** in view of economic and social demand for more water needs to be addressed.
- **Groundwater pumpage** is causing wetlands, trout streams, and other surface waters to be drained or lowered.
- The rules and policies currently in place **favor the user** rather than resource protection. They also deal with each proposed use **on a case-by-case basis** rather than addressing the resource impacts of the collective uses of all who depend on a particular aquifer.
- An across-the-board effort to establish **water conservation as a habit** is needed; it must include a strong educational component.
- It is questionable if the current level of environmental review provides for a review or assessment of stream and wetland impacts due to changes or modifications in groundwater hydrology from **dewatering activities** related to construction activities.
- It may be time to consider having the legislature direct that another **evaluation of water management** occur in the metropolitan area, as well as other rapidly developing corridors such as the I-94 corridor between Minneapolis and St. Cloud, similar to what was done in 1989.
- State and local agencies should strengthen cooperation and **joint work efforts**.
- There is no systematic mechanism for identifying, and no incentives to replace, old, unsafe **private water wells**.
- Require **analysis of water use by water source**. For example, what is the use from the Jordan or from the Mt. Simon-Hinckley. Ask how use affects supply.

#### B. Planning

- Groundwater sustains **calcareous fens**. Our ability to implement this protection is limited due to lack of scientific knowledge, as well as trained individuals who can apply that scientific knowledge to these rare wetlands.

- The state has no comprehensive plan for dealing with **nitrate contamination**.
- There is no **integrated statewide database** on groundwater quality.
- Groundwater is still a **forgotten resource**. Its scarcity and contamination potential still does not get considered in decision making in local growth/business development decisions.
- We need to monitor **buried drift aquifers in western Minnesota** closely. Wetland drainage in that area may have eliminated critical recharge areas. It could take 40 to 50 years for these impacts to become apparent.

### C. Funding

- More **funding** of systematic **groundwater monitoring** is needed.
- More funding is needed to **support local programs** in water planning, inspection of on-site sewage treatment systems, and well sealing.
- **Cost containment** for the **ACRRA** program is a significant concern. Costs per site need to be “capped” so as to prevent rewards for recontamination.
- Also, the **nitrogen fertilizer nonpoint program** needs to be funded adequately to address citizens’ and farmers’ concerns.
- We need research to better understand the quality and extent of the resource. The legislature needs to **fund research**.
- We need to a) **increase fees** and b) apply increases as necessary to fully fund ambient monitoring and atlas/regional assessment development.

### D. Information

- The **Legislative Water Commission** provided an opportunity to provide continuity on **coverage of issues** and development of expertise within the legislature on water resource problems and programs. Agencies no longer have one body with whom they can discuss needs, status and trends, emerging issues, and proposed programs, nor is there opportunity for the legislature to provide feedback to agencies on water issues in a single forum.
- **Emerging threats** to groundwater that were not anticipated by the act and which have become issues in the new millenium include persistent bioaccumulative toxics

(PBTs), pesticide metabolites, endocrine disrupters, and pharmaceuticals. The health risks due to their occurrence in groundwater need to more thoroughly studied.

- Surface water quality **impacts microenvironments**. Not enough information is known about the impacts of concentrations of pollutants, below the maximum contamination levels, on the aquatic environment.
- Have **one agency responsible for monitoring** and have it certify any expenditure of monitoring funding by other agencies. Insist on trend information to show results of expenditures and programs.
- Start a process to understand **groundwater yield** and fund it.
- We only show real **concern about water resources during crisis**—drought or flood. There is little real public education about the limits of water resources.

## Summary

This survey effort led to some valuable lessons: it's a useful exercise to look back at a major law and its implementation; some ten year-old issues get resolved, some only partially, some not at all; new variations of similar issues evolve that continue to highlight groundwater as a concern. Of course, times change, conditions do also, and new lawmakers and program implementors come and go.

There is no one to blame for certain unfulfilled goals and expectations stemming from the Groundwater Act. It was a major effort, with a lot of requirements that relied on consistent funding and education needs. Hopefully, for the reader, Part III of the survey, highlighting future concerns and recommendations, reviews the major state groundwater issues that will be debated early on in the 21<sup>st</sup> century.

In summary, I believe the Groundwater Act of 1989 accomplished some broader results than the tangible benefits mentioned in the survey. They are:

- The act was a common civic good that brought diverse interests together in a bipartisan manner.
- It led to a collective vested interest that left a legacy for future generations by setting goals to protect the public's drinking water.
- Groundwater, as an important natural resource, became better understood for future needs and management.
- By this investment in understanding and new knowledge of the groundwater resource, the potential was created to save future public dollars by identifying supply and preventing its contamination.

## Appendix

### Survey Methodology

As the author of this information brief worked on the 1989 Groundwater Act, he was aware of the entities and the participants in its development. Many of them are still working for state agencies, but many others are no longer working on groundwater concerns, or have left the state. The author identified the key participants—ten individuals—who work in the area and devised eight simple questions for them to respond to. Fortunately, all ten responded with complete answers and the author is grateful for their participation in sharing this information. Nine of the ten respondents still work for public agencies, and most are involved in groundwater program issues. The other respondent is in the private sector, but closely tied to activities of state agencies with groundwater responsibilities. This does not constitute a scientific survey and should not be considered such. The questionnaire follows:

### Questions Asked in the Groundwater Survey

What has been accomplished by the 1989 Groundwater Act that your agency is aware of?

What has *not* been accomplished by the 1989 Groundwater Act that should have?

Why haven't certain goals been accomplished? (Lack of funding? Lack of resources? etc.)

What are the overall challenges and problems with the 1989 Groundwater Act? Some suggestions are outlined below. Please feel free to discuss these problems, as well as any others that you are aware of.

- Lack of coordination
- Low emphasis on education
- Lack of stable funding for basic data gathering
- Scattered resource material
- Limited availability of education training opportunities
- Measure of the impact of local groundwater education programs can be difficult

Are there any new groundwater concerns or issues that must be addressed by the legislature? (water quality concerns, water quantity concerns, mining impacts, wetland/stream impacts, etc.)

What are the reasons for these concerns?

What concerns does your agency have in particular?

Any other recommendations?