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February 1994

*Illinois Groundwater
Protection Program:
Volume I: Biennial Policy Report*

*Prepared by the
Interagency Coordinating Committee
on Groundwater*

February 1994



State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

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217/782-3397

The Honorable Jim Edgar
the Governor,
State of Illinois

The Honorable Members
of Illinois General
Assembly

I am pleased to transmit our three volume report, "Illinois Groundwater Protection Program", which has been prepared pursuant to Section 4(b)(8) of the Illinois Groundwater Protection Act (P.A. 85-0863). This is the third biennial report of the Interagency Coordinating Committee on Groundwater. The report has been divided into three volumes to simplify the review process. The Volume I report focuses on policy related issues, Volume II provides a detailed account of programmatic achievements, and Volume III consists of technical appendices that support the other two reports.

The Act created a comprehensive, prevention-based policy focused on beneficial uses of groundwater and preventing degradation. As shown in the reports, much progress has been made but much more is needed, especially in regard to vulnerable regional groundwater supporting potable uses.

The reports give the status of various elements of groundwater protection organized in the general order of the Act. The Volume I policy report focuses on three critical issues to estimate the amount of groundwater protection progress made. An executive summary is provided in the Volume II report for quick reference. The reports also include several figures, tables and appendices to help document our progress.

Sincerely,

A handwritten signature in black ink that reads "Mary A. Gade".

Mary A. Gade
Director

Submitted to the Governor
and Illinois General Assembly

ILLINOIS GROUNDWATER PROTECTION PROGRAM

VOLUME I: BIENNIAL POLICY REPORT

February, 1994

Prepared by the
Interagency Coordinating Committee
on Groundwater

What Groundwater Means to Illinois

Approximately seven and one-half (7.5) million people in Illinois, which represents nearly 50 percent of the population, rely on groundwater for their source of drinking water. There are 1,775 community water supply (CWS) systems in the state, of which 1,361 or 77% are groundwater supplies. The 1,361 communities utilizing groundwater must maintain over 3,400 wells to meet their needs. Also, there are approximately 5,800 non-community wells that serve schools, restaurants, parks and other businesses. In addition to the public wells described above, approximately 400,000 residences in Illinois are served by their own private wells.

Protecting this vital resource is critical to ensure potable water for future generations. As will be demonstrated, protecting our groundwater resource is also essential to avoid economic repercussions that are a result of groundwater contamination. This biennial report presents an overview regarding Illinois' reliance on groundwater resources, the growing problems of groundwater contamination, potential sources of future adverse impacts to groundwaters, and preventive approaches to groundwater protection.

Illinois Groundwater Protection Act

The Illinois Groundwater Protection Act (P.A. 85-0863, 1987) responds to the need to manage groundwater quality by emphasizing a prevention oriented process. The Illinois Groundwater Protection Act (IGPA) is a comprehensive law which relies upon a

state and local partnership. Although the IGPA is directed toward protection of groundwater as a natural and public resource, special provisions target drinking water wells. This biennial report to the Governor and General Assembly is intended to provide a comprehensive overview of the implementation efforts since the adoption of the IGPA. The biennial report has been divided into three volumes to help simplify the review process, and to allow for a new approach to evaluate progress. This report is entitled Volume I: A Biennial Policy Report on the Groundwater Protection Program. Volume II provides a detailed description of the groundwater protection programmatic efforts, and Volume III contains supporting technical appendices.

The IGPA responded to the need to protect groundwater quality and established a unified groundwater protection program using the following elements:

- Sets a groundwater protection policy;
- Enhances cooperation;
- Establishes water well protection zones;
- Provides for surveys, mapping and assessments;
- Establishes authority for recharge area protection;
- Requires new groundwater quality standards; and
- Requires new technology control regulations.

The groundwater policy sets the framework for management of this vital resource. The law focuses upon uses of the resource and establishes statewide protection measures directed toward potable water wells. In addition, local governments and citizens are provided an opportunity to perform an important role for groundwater protection in Illinois.

The groundwater program has initiated both long and short-term efforts at protecting the groundwater resources in Illinois. Many efforts have focused on education, and these have been quantified in the Volume II report. Quantifying the amount of groundwater protection that has occurred for critical groundwater resources that support potable use or determining the amount of threatened resource is more difficult. However, utilizing the data that has been collected from the past six years for community water supply wells, an estimate can be made on the amount of groundwater protection that has occurred and conversely the amount of threatened critical groundwater resource present.

Threatened Groundwater Resources

The assessment of groundwater protection has been divided into three separate but interrelated issues, as follows:

- critical potable resource groundwater protection;
- potential contamination sources; and
- impacted groundwater quality.

Issue I: Critical Groundwater Resource Protection

To estimate the amount of groundwater protection that has occurred in Illinois over the past six years relative to the overall resource, data from community water supply wells was utilized. Illinois, as stated earlier, has 1,361 CWS that utilize groundwater, which represents about 77 percent of the community systems in the state. These potable water supply wells use groundwater that is pumped from geologic materials below the land surface, and these geologic materials are referred to as aquifers. In some areas of the state, aquifers are overlain by

soils and other geologic materials that provide natural protection to the groundwater, but in other areas such as the City of Rockford or Mason County there is no natural protection overlying the aquifers. Therefore, under these conditions the groundwater is very vulnerable to any type of contamination that is released on or below the land surface.

Many of the 3,433 community water supply wells in the state utilize aquifers that are vulnerable to contamination, and it is estimated that there are 500 such wells representing 200 CWSs. A portion of the land surface area for these types of wells directly recharge the aquifer from precipitation. Over the past six years the Illinois Environmental Protection Agency (Agency) has estimated the recharge area for a number of the community water supply wells utilizing vulnerable aquifers, and has determined that an average size for a recharge area that will supply water for a five-year period is approximately 130 acres. Thus, if this is extrapolated to the 500 highly vulnerable community water wells or 200 systems, there are 65,200 acres of highly vulnerable resource groundwater supporting CWSs in the state.

The IGPA established a three-tiered approach for protecting or supporting the aforementioned groundwater uses in Illinois. The first tier implemented minimum setback zones of either 200 or 400 feet. The latter minimum setback zone was established for the more vulnerable community water supply wells in the state.

New potential primary sources, potential secondary sources and potential routes of contamination are prohibited from locating in minimum setback zones.

The second tier of protection provides authority to local units of government to extend this zone up to a maximum of 1,000 feet radially from the well, which also expands the prohibition of new potential primary sources of contamination. Maximum setback zones are established by local governments in conjunction with an Agency review procedure. Under certain situations, the Agency may also propose the adoption of a maximum setback zone through rulemaking before the Pollution Control Board.

The last tier of protection can be accomplished by establishing a regulated recharge area. Regulated recharge areas are established through a Pollution Control Board rulemaking procedure. The Illinois State Water Survey (ISWS) worked with Agency staff to analyze 300 CWS wells utilizing vulnerable aquifers, and determined that 80 to 90 percent of the recharge areas were greater than 1,000 feet. Therefore, many of the vulnerable CWS wells would not be adequately protected by maximum setback zones.

Under the Illinois program, each of these protection measures provides a different degree of protection or use support to vulnerable potable resource groundwater. In order to evaluate the progress made and determine the amount of additional work needed to fully support this vulnerable groundwater resource, a critical protection status chart has been developed to relate to

the Illinois groundwater protection program.

The Agency has determined that minimum setback zones provide a baseline of protection for potable use support, maximum setback zones provide supplemental protection for potable use support and regulated recharge areas could theoretically provide protection for full use support for vulnerable CWSS. Table I represents the status of Illinois groundwater protection progress to date for these critical areas.

TABLE I. CRITICAL PROTECTION STATUS CHART

TYPE OF PROTECTION	NEEDED FOR FULL PROTECTION (acres)	ACTUAL PROTECTION IN PLACE (acres)	PROGRESS RATES (%)
BASELINE PROTECTION AREA (minimum setback zone = 12 acres per well)	6,000	6,000	100%
SUPPLEMENTAL PROTECTION AREA (maximum setback zone = 60 additional acres per well)	30,000	4,200	14%
POTENTIAL RECHARGE AREA (regulated recharge area = 58 additional acres per well)	29,200	0	0%
TOTALS (130 acres per well)	65,200	10,200	16%

The data described above indicates that there are approximately 10,200 acres out of 65,200 acres that have baseline and/or supplemental protection measures in place. However, 84% of the critical resource groundwater for the State still lacks adequate protection. This provides a first cut effort at estimating the groundwater protection progress made for this critical resource.

Issue II: Potential Contamination Sources and Routes

Another aspect of determining the amount of potentially threatened groundwater resource in highly vulnerable areas is the number and types of existing potential contamination sources and/or potential routes of contamination located in the three different areas described above. The Agency has inventoried potential sources and routes of contamination as required by the IGPA for the past six years, and over 97 percent of these well site surveys have been completed.

Potential routes of contamination include improperly abandoned wells, sand and gravel quarries and injection wells of all kinds. Potential routes provide a direct pathway for contaminants to enter the groundwater supply. The IGPA also required the Agency to conduct an inventory of potential primary and secondary sources of contamination. In general, potential primary sources are facilities that treat, store or dispose (TSD) of special or hazardous waste and/or store or accumulate large quantities of hazardous substances. Potential secondary sources of contamination include above and below ground petroleum storage, agricultural facilities, deicing agent storage and domestic waste water treatment plants.

A statistically random selection process was utilized to evaluate a subset of well site survey reports for review. This process provided an estimate of the number and types of potential sources and/or potential routes of contamination within the survey area relative to the 500 highly vulnerable wells or 200

CWS. In addition, the Agency is in the process of developing a data base to store and organize all of the information from the well site survey reports. This project will require a number of years to complete with existing resources, but estimates provided in this report will continue to be refined as this project is implemented.

These statistics should be considered preliminary estimates because much of the verification work required to provide better estimates would require on-site inspections at specific sources. The IGPA requires the Agency to conduct well site surveys, and the statute did not intend for the surveys to be on-site inspections at specific sources. Therefore, these estimates will primarily be updated with intra-agency file searches and on-site inspections when the Agency is requested to conduct a hazard review. (The Volume II Report provides further detail about the hazard review process.)

As described above, there are also a number of potential contamination sources that could not be classified without conducting an on-site inspection. However, these potential sources are still inventoried in the well site surveys, and can be described in general categories.

Figure 1 below shows an estimated statewide density summary depicting the number of potential routes and potential sources of contamination per square mile in the baseline and supplemental

Density of Potential Routes/ Sources Per Square Mile for BPA and SPAs

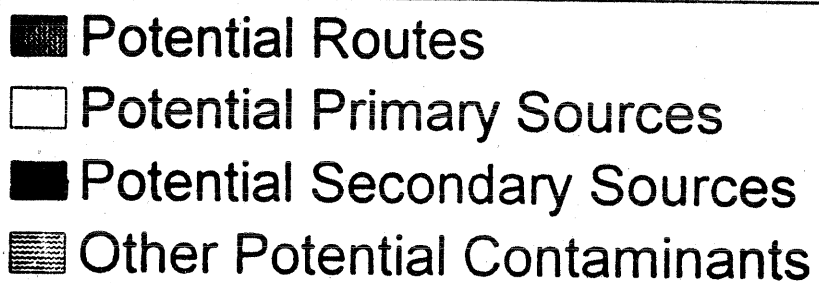
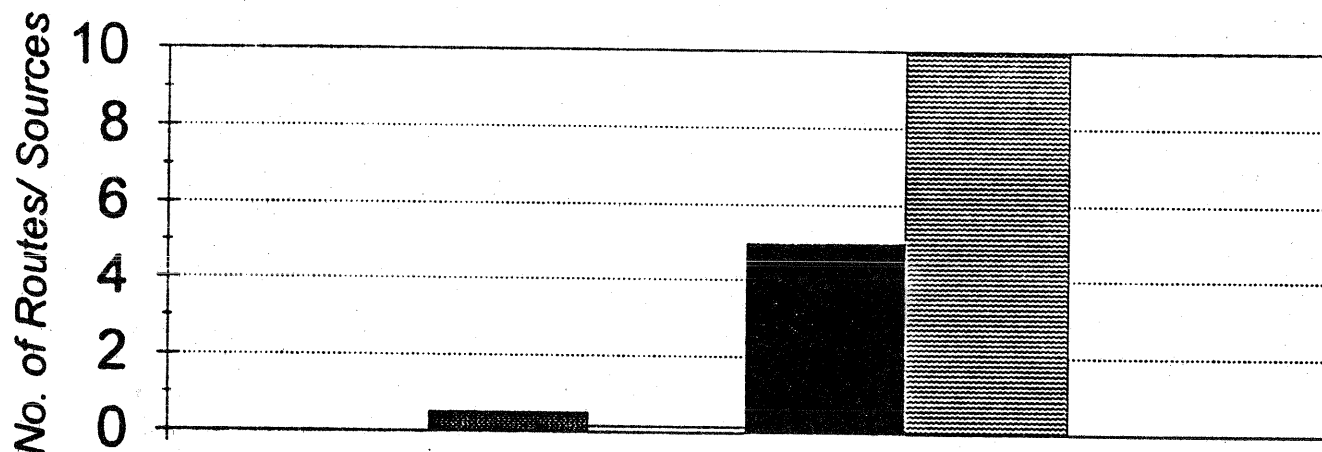


Figure 1 illustrates the estimated number of potential routes, potential sources, and other contaminants per square mile in the baseline and supplemental protection areas of the 200 CWSs.

protection areas for the 200 CWSs.¹ The number of potential contamination sources and/or routes of contamination located within potential recharge areas was not illustrated because there is only a limited amount of data available through the hazard review and needs assessment processes.

The information shown in Figure 1 illustrates that there are several potential routes and potential sources of contamination currently located within the minimum (400 feet) or maximum setback zone (1,000 feet) of highly vulnerable wells. Since there are limited protective measures under the IGPA that can be implemented to protect these vulnerable wells from the existing potential route/sources located near a wellhead, more efforts must be made to ensure the integrity of these wells from a preventive standpoint. Such efforts might include additional groundwater standards, broader technical controls on potential sources or voluntary pollution prevention, discussed later. As shown in Table 1, only 10,200 acres of actual protection are in place for these critical areas while 55,000 acres still lack adequate protection of the resource groundwater.

¹ The survey area of potential contamination sources and routes under the IGPA is 1,000 feet. However, some sources beyond 1,000 feet may be included in the summary because the survey area was extended to 1,500 feet as the survey process was refined. This was done to provide a better evaluation of these potential sources and routes.

Issue III: Impacted Groundwater Quality

In 1984 the Agency and the United States Geological Survey (USGS) began sampling CWS wells for volatile organic chemicals (VOCs). Survey results indicated that approximately 4 to 5 percent of all 3,433 CWS wells in the state were contaminated with one or more chemical compounds. At the time the Agency and USGS began finding these contaminants, there were neither drinking or groundwater standards established for the types of compounds being detected.

The USEPA prepared an assessment of the national water supply replacement cost due to groundwater contamination from nine types of contamination sources. The present total national value of resource damage from these sources was estimated to be greater than \$28 billion. The USEPA study also provided a summary from a site specific case involving a leaking underground storage tank that has cost \$1.9 million in State funds, and \$1 million in cost for direct and borrowed funds to the community for aquifer rehabilitation. Now over 13 years later, this site still requires necessary treatment, and daily monitoring will be required for 3 years following the completion of the aquifer rehabilitation program. In addition, for contamination cases where the only feasible alternative is drilling new wells the cost of installing new distribution systems or connecting users to existing community water supplies is substantial. In cases where these alternatives were necessary, costs have ranged from \$70 thousand to over \$2.3 million, depending on the extent of

contamination and the population served.

The Agency has also evaluated some of the costs associated with contaminated community water supplies in Illinois. In December, 1981, the Rockford Water Utility could no longer utilize municipal wells 7 and 7A because of contamination by volatile organic compounds (VOCs). These wells, with a capacity of 7.5 million gallons per day, representing one fourth of Rockford's water needs, were permanently lost to the City. In order to supplement this loss, the City had to drill new wells into deeper, but less productive aquifers. Over the past five years the City has added five new wells at a cost of approximately \$7.5 million. To further compound this situation, several hundred private wells in the Southeast Rockford area have been hooked up to the City system, at a cost of approximately \$4 million. It is also anticipated that the approximate cost for the entire Southeast Rockford contamination site will be approximately \$15-20 million.

The City of Fox River Grove has spent \$500 thousand dollars to design and install a VOC stripping tower to treat water from two of their wells contaminated by VOCs. The cost for designing a similar air stripping tower for the City of Freeport, because of VOC contamination, was \$570 thousand dollars. It cost the State, through a grant to the Village of Chandlerville, \$260 thousand dollars to find and install an alternate source of drinking water because pesticide contamination levels exceeding the drinking water standards were present in the community's only

water supply well.

The cost of groundwater contamination is significant. In contrast, the cost of implementing a local groundwater protection program can be off-set in relation to the costs of contamination. Therefore, the vulnerable CWSSs discussed in this report would all benefit from establishing protection programs in recharge areas that extend beyond the minimum and/or maximum setback zones established under the IGPA. The IGPA provided setback zones, and surveys of potential sources and routes of contamination for CWSSs. It also authorized certain communities served by groundwater to conduct "groundwater protection needs assessments". A groundwater protection needs assessment defines the critical recharge area(s), identifies the existing potential contamination sources and/or potential routes located in this area, and also relates this information to the existing land use zoning. An assessment also evaluates the water supply contingency plans in the event of contamination incidents. The combination of this data will allow for the application of a balanced management plan for the protection of these groundwater resources. The Volume II Report summarizes the pilot groundwater protection needs assessments that have been completed. Additionally, the ISWS, Illinois State Geological Survey and the Agency are in the process of developing a Groundwater Protection Needs Assessment Guidance Document. The Agency is also providing technical assistance to communities using available resources, however, this assistance may not be able to keep pace with the

rate of rapidly growing communities in certain parts of the State.

Groundwater protection in these recharge areas could be achieved by applying certain design and/or operating practices for new potential sources of contamination. Another approach that could be utilized to protect these critical resource areas in relation to new and existing potential contamination sources is now being implemented by many companies, and is referred to as pollution prevention. Pollution prevention involves reviewing the use of all hazardous and liquid chemicals in plant or company processes, and when possible, adjusting the process to eliminate waste products or replace hazardous with non-hazardous materials. Thus, a pollution prevention program at a company will:

- reduce operating costs;
- reduce risk of criminal and civil liability;
- improve employee morale and participation;
- enhance company's image in the community; and
- protect public health and the environment.

In 1986 the United States Environmental Protection Agency (USEPA) amended the federal Safe Drinking Water Act (SDWA) to establish drinking water standards and associated compliance monitoring programs for many of the VOC contaminants. The drinking water standards are established to protect against long term potential adverse health effects, and the concentrations associated with these are measured in parts per billion (ppb). To place this into perspective, one tablespoon of trichloroethylene (TCE), a common solvent and metal degreaser, in an average sized water tower would result in a concentration of

TCE exceeding the drinking water standard of 5 ppb by ten times.

Since this new monitoring program was initiated, several CWS have been determined to be utilizing groundwater that is contaminated with one or more VOCs. All samples were collected at the CWS treatment plant at a point in the system after treatment pursuant to the SDWA compliance monitoring program. There were 53 CWS that had one or more VOCs detected. Figure 2 illustrates the number of CWS relative to the VOCs found.

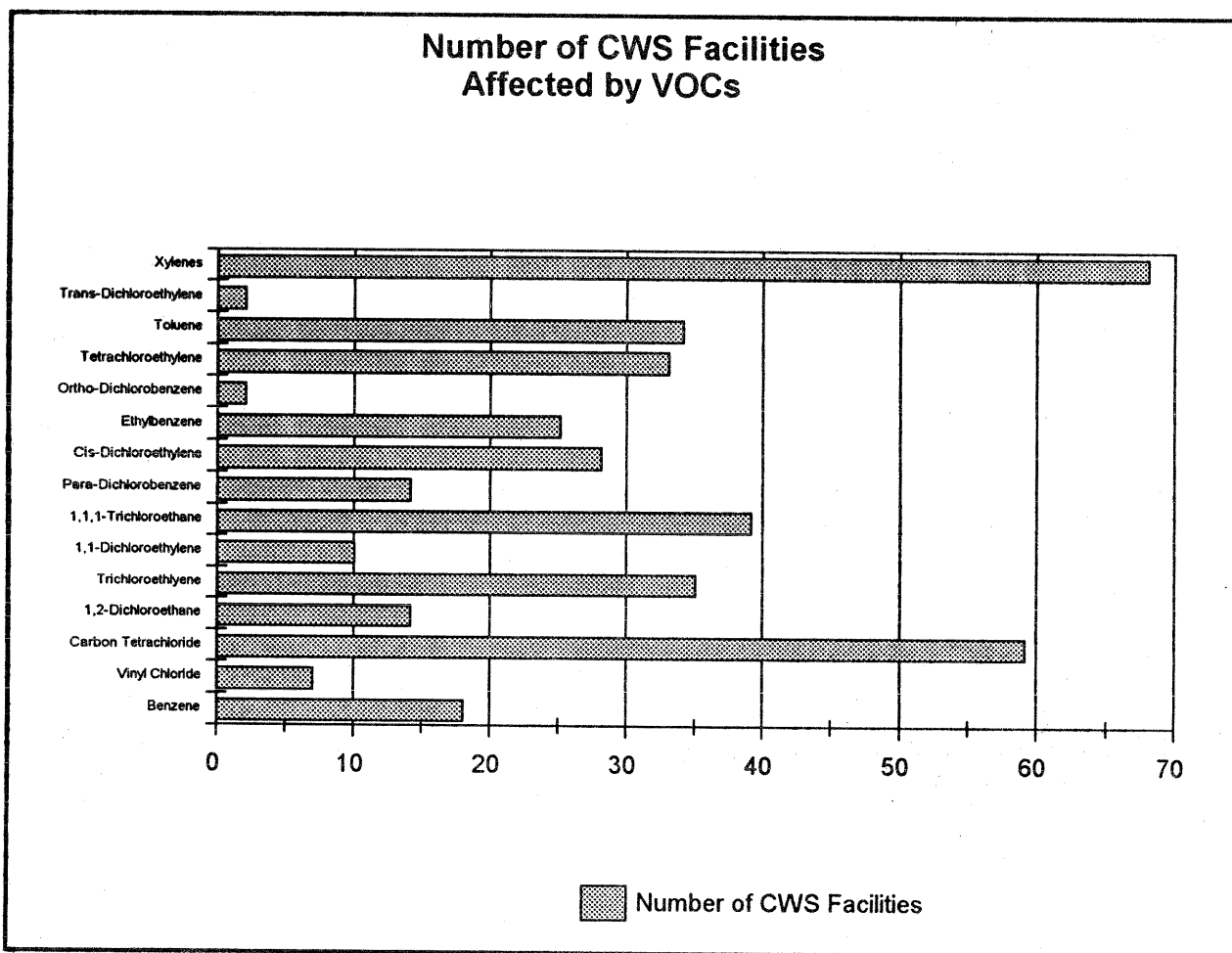


Figure 2 illustrates the number of CWSs affected by VOC contamination.

Issue II of this report addresses the number, types and proximity of potential contamination sources relative to the 200 vulnerable CWS. It is estimated that many of these same vulnerable supplies are the ones affected by the chemical contaminants described in Figure 2 above. The most frequently encountered potential secondary source of contamination was underground gasoline storage tanks, and the most frequently encountered VOC in the 53 CWSs was xylene, a common constituent in gasoline. The VOCs were detected at a range of concentrations, and these are summarized in Table II relative to the Class I: Potable Resource Groundwater Standards.¹

¹ GW quality standards for 52 chemical substances were adopted by the PCB on November 7, 1991. These comprehensive standards are a key part of the protection system.

TABLE II. SUMMARY OF VOC CONCENTRATIONS FROM THE 53 CWSs

Volatile Organic Chemical	Class I Groundwater Standards (ppb)	Range of Voc Concentrations found in CWSs (ppb)	Mean VOC Concentrations found in CWSs (ppb)
Benzene	5.0	0.5-9.8	1.63
Vinyl Chloride	2.0	0.54-6.7	1.75
Carbon Tetrachloride	5.0	0.5-6.3	1.46
1,2-Dichloroethane	5.0	0.5-2.2	0.99
Trichloroethylene	5.0	0.34-22.0	3.15
1,1-Dichloroethylene	7.0	0.5-11.0	3.41
1,1,1-Trichloroethane	200.0	0.5-77.0	5.48
Para (1,4)Dichlorobenzene	75.0	0.6-4.6	2.21
Cis (1,2)Dichloroethylene	70.0	0.5-19.0	3.23
Ethylbenzene	700.0	0.5-5.7	3.21
Mono-Chlorobenzene	100.0	0.5-14.0	3.41
Ortho (1,2) -Dichlorobenzene	600.0	1.5-3.3	2.6
Styrene	100.0	---	1.4
Tetrachloroethylene	5.0	0.5-35.0	2.97
Toluene	1,000	0.6-27.0	2.50
Trans-1,2-Dichloroethylene	100.0	0.5-10.0	4.18
Xylene (s)	10,000.0	0.5-214.0	6.69
Methylene Chloride	5.0 ²	0.5-8.1	1.41
1,2,4-Trichlorobenzene	70.0 ²	---	0.7
1,1,2-Trichloroethane	5.0 ²	2.9-5.6	4.25

² Proposed Class I: Potable Resource Groundwater Standard

Common VOCs/Industrial Solvents Affecting CWS Facilities

Many common materials such as gasoline, oil, paint and industrial solvents are potential groundwater contaminants. Among those most often occurring in public groundwater supply systems in Illinois are chemical solvents commonly used by dry cleaners, automotive service stations, metal finishing and fabricating facilities, and other industrial activities. The

VOCs/industrial solvents detected in Illinois CWSs are listed in Table II. The health effects of VOCs/industrial solvents are addressed in terms of "acute toxicity" (effects from immediate, short-term exposure), and "chronic toxicity" (effects from long-term exposure). Acute health effects from VOCs/industrial solvents include unconsciousness, circulatory collapse, and negative effects on the central nervous system. The major concern is potential chronic effects which may include increased occurrence of cancer, birth defects, damage to the kidneys, heart, liver and lungs.

In addition to sampling for VOC contaminants, the drinking water program requires CWSs to test for pesticides [also known as synthetic organic chemicals (SOCs)]. Community water supplies began testing for these constituents approximately one year ago. To date, 36 CWSs utilizing groundwater have detected one or more SOCs. These supplies were required to begin quarterly sampling of the finished water. Ultimately, all 1,361 groundwater supplies in the state will be sampled.

Figure 3 below illustrates the number of facilities affected by SOCs and the type of SOC detected. The pesticides found are commonly used for various agricultural purposes. The well site surveys conducted by the Agency for the 36 CWS's affected by SOC contamination were evaluated to determine the adjacent land use(s). Twenty-six of the CWS's were determined to be located in areas that were primarily zoned commercial with nearby potential point sources (agricultural facilities). However, 10 of the CWSs

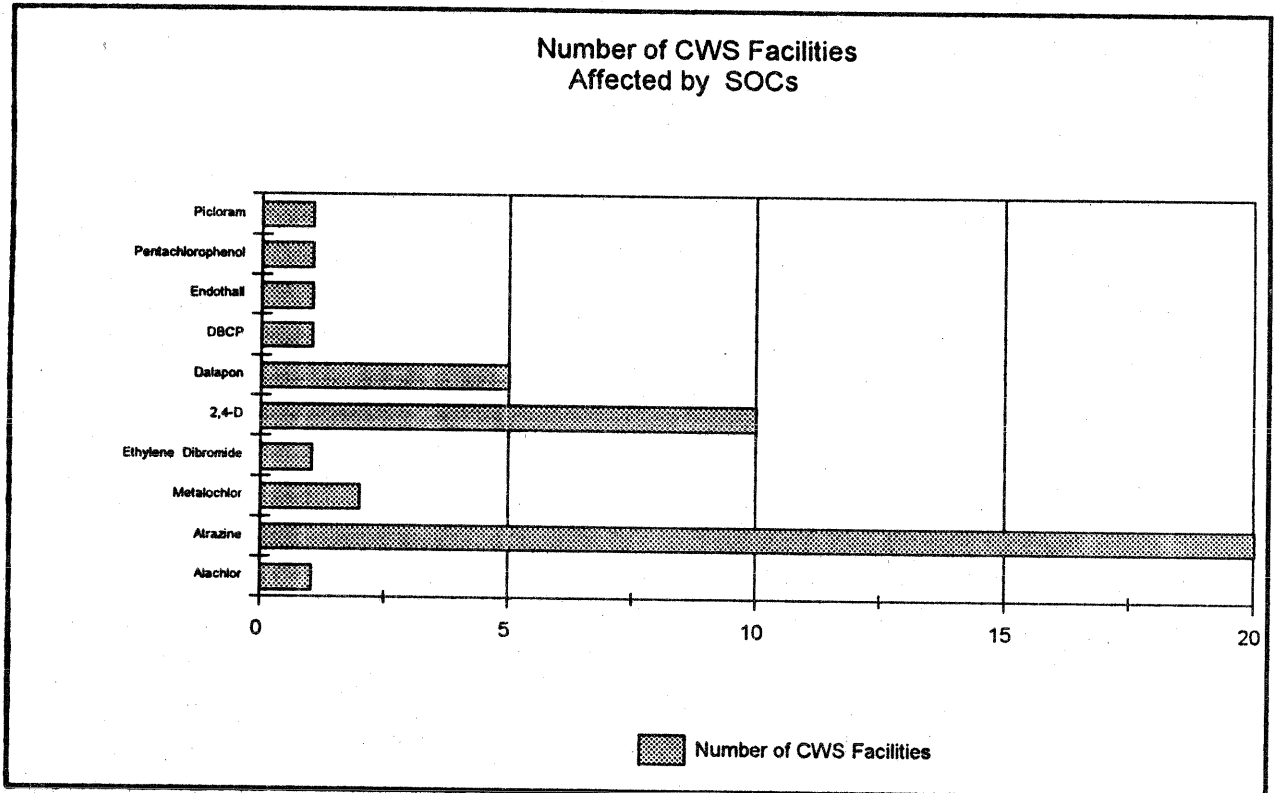


Figure 3 illustrates the number of CWSs affected by SOC contamination.

were located in areas where the surrounding land use was primarily agricultural cropland, and there were no apparent potential point sources of contamination. Further detail regarding these communities is provided in the Volume II Report.

The range and average concentration for the SOC's detected in the 36 CWSs are summarized below in Table III. The SOCs are compared to the appropriate Class I groundwater standard or health advisory level.

TABLE III. SUMMARY OF THE SOC CONCENTRATIONS FROM THE 36 CWSs

Synthetic Organic Chemical	Class I groundwater Standard (ppb)	Range of SOC Concentrations found in CWSs (ppb)	Mean SOC Concentrations found in CWSs (ppb)
Atrazine	3.0	0.10-4.2	0.42
Alachlor	2.0	1.5-3.0	2.25
Metalochlor	100.0 ¹	0.34-3.8	2.11
Ethylene Dibromide	0.05 ²	---	0.02
Pentachlorophenol	1.0	---	0.04
2,4-D	70.0	0.11-0.35	0.17
Endothall	100.0 ²	13.0-25	19.67
Picloram	500.0 ²	---	0.14
Dalapon	200.0 ²	1.1-2.4	1.8
1,2-Dibromo-3-Chloropropane	0.2 ²	---	0.02

¹ Health Advisory

² Proposed Class I Groundwater Standard

Common Pesticides (SOCs) Affecting CWS Facilities

Many pesticides and fertilizers are potential groundwater contaminants. Most of these compounds are man-made, and are therefore, known as synthetic organic chemicals. These groundwater contaminants come from human activities and land uses. For example, agricultural point source (i.e., distribution centers) and non-point source (i.e., farm field applications) pose potential hazards to groundwater. The widespread occurrence and persistent toxicity of pesticides is of great concern for public health. The health effects of pesticides are addressed in terms of "Acute Toxicity" (effects from immediate, short-term exposure) and "Chronic Toxicity" (effects from long-term exposure). Acute health effects from pesticides include burns, nausea, and/or vomiting. The major concern is potential chronic effects including increased occurrence of cancer, birth defects,

genetic mutations, damage to kidneys, and damage to the central nervous system. The pesticides (SOCs) detected in Illinois CWSS are summarized in Table III.

Summary of Progress and Conclusions

Illinois has made adequate progress in implementing groundwater protection programs. However, a great deal of work remains to be done to protect the 55,000 acres of vulnerable groundwater resource utilized by CWSS. It can be assumed that some of this resource has already been adversely impacted by groundwater contamination, based on groundwater quality monitoring results to date.

The pollution of groundwater can have wide-ranging economic implications to communities and businesses. Groundwater contamination can produce the following adverse economic hardships:

- devalued real estate;
- diminished home sales or commercial real estate sales;
- loss to the tax base;
- consulting and legal fees;
- increased maintenance costs; and
- increased water rates, the cost of alternative water sources, as well as, the cost for new equipment, treatment, and direct cleanup.

All of these costs have a potential to adversely affect local economic development.

Prevention of groundwater contamination, therefore, is a reordering of a philosophy of operations and maintenance. It must not be assumed that contamination occurs solely as a result of catastrophic leaks or spills. Certainly events of this nature can result in groundwater contamination problems. However, at

least as many problems may occur as a result of poor housekeeping, equipment attrition and poor maintenance, improper or uncontrolled product transfers, erosion or corrosion of tanks and piping, and minor common daily operations. These activities, which may appear benign, may in fact cause an accumulation of contaminants or problems, and unanticipated costs.

Recommendations

A local groundwater protection program established in community well recharge area(s) allows a community to focus its management efforts, avoid excessive management and regulation in areas that do not contribute groundwater to the wells, and avoid spending time and funds on protecting non-critical areas. This type of prevention program could also allow the State to provide a waiver to reduce the amount of community well monitoring required under the SDWA, and therefore the cost to the community.

Communities should conduct needs assessments to evaluate the existing hazards to their water supplies. The needs assessment would also provide information concerning hazards within the potential recharge area of their wells, which when combined with local zoning and planning information can be utilized as one means of wellhead protection. In addition, communities need to incorporate regional groundwater protection concerns as a key component of planning and zoning issues, since zoning is frequently a blueprint for growth. However, resources in the form of financial assistance or other incentive programs from the State or federal government may be required to assist in

performing groundwater protection needs assessments and to make local wellhead protection programs truly effective. Another option for funding could include statutory authority for communities to charge fees for proactive protection of drinking water. This type of assistance would further leverage the resources available from the State to protect these critical resource groundwaters. In the long run this type of local technical assistance program could lead to cost savings and more opportunities for economic growth for many companies and communities. Companies and communities must have uncontaminated sources of drinking water to remain economically vital and safely serve public water supply needs.

Additionally, the future direction of the Groundwater Quality Protection Program should emphasize continued development of the State Management Plan for the protection groundwater from pesticides applied to cropland, monitoring and evaluation of pesticides in groundwater, integration of groundwater and surface water protection programs, and continued implementation of the groundwater quality standards and the technology control regulations. The future directions should also further expand efforts in the Priority Groundwater Protection Planning Regions. A Groundwater Protection Needs Assessment Guidance Document should be prepared to assist local governments and consultants, and the Groundwater Advisory Council should sponsor a forum on groundwater protection needs assessments and regulated recharge areas.

