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Illinois Environmental Protection Agency

Bureau of Water
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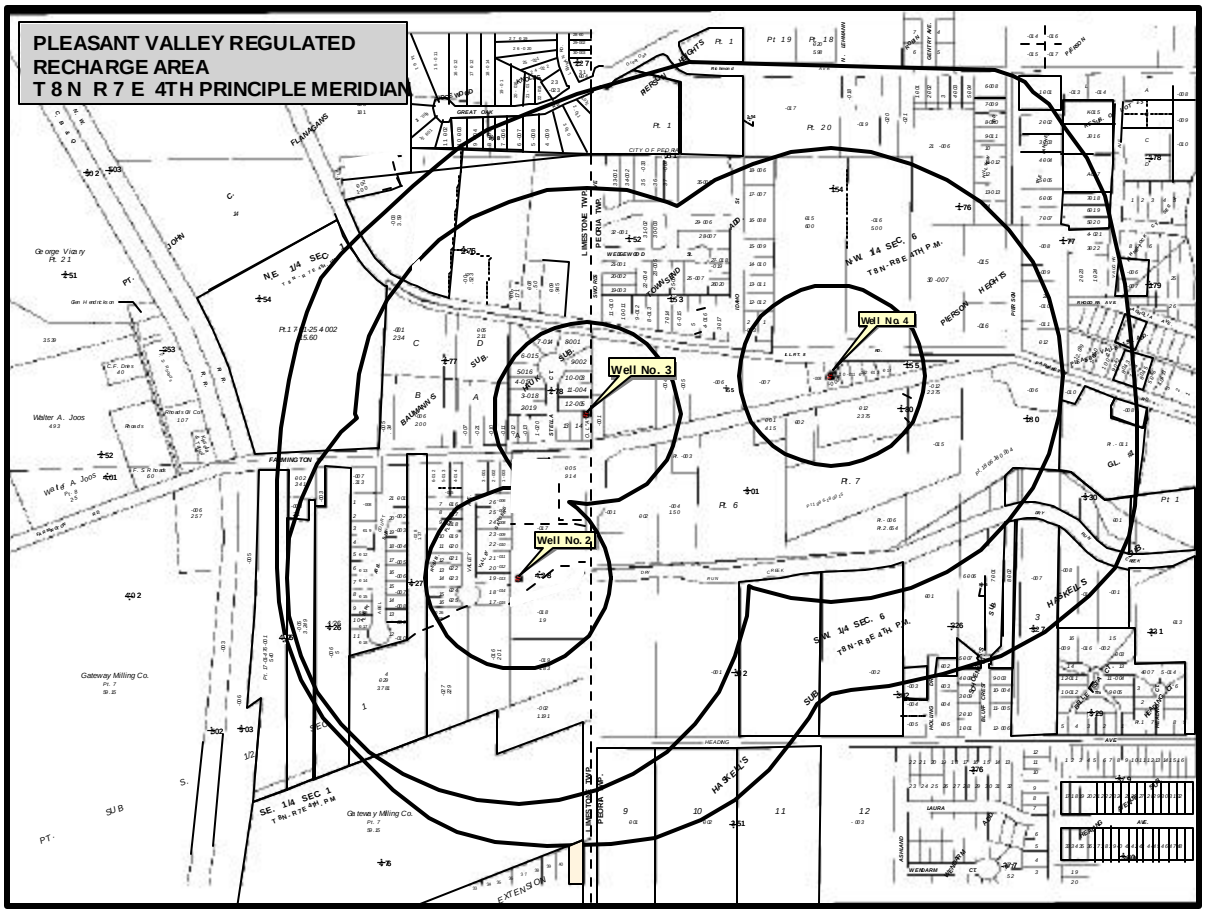
January 2002

IEPA/BOW/02-001

Illinois Groundwater Protection Program

Biennial Comprehensive Status and Self-Assessment Report



January 2002

Prepared by the Interagency Coordinating Committee on Groundwater

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217/782-3397

The Honorable George Ryan
Governor
State of Illinois

The Honorable Members
of the Illinois General
Assembly

I am pleased to transmit our biennial report entitled, "Illinois Groundwater Protection Program", which has been prepared pursuant to Section 4(b)(8) of the Illinois Groundwater Protection Act, 415ILCS55/4 (Act). This is the seventh biennial report of the Interagency Coordinating Committee on Groundwater with input from the Groundwater Advisory Council and four Priority Regional Groundwater Protection Planning Committees. This report provides a policy perspective on groundwater quality and quantity protection in Illinois, including a comprehensive status and assessment of the program.

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

The report gives the status of various elements of groundwater protection, and provides future directions for groundwater protection program activities. The report also includes several figures and tables to help document our progress.

Sincerely,

Renee Cipriano
Director

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ACRONYM GLOSSARY

Act	Illinois Environmental Protection Act
BMP	Best Management Practices
Board	Illinois Pollution Control Board
BOL	Bureau of Land
BOW	Bureau of Water
CAS	Compliance Assurance Section
CDC	Centers for Disease Control and Prevention
CSGWPP	Comprehensive State Groundwater Protection Program
CTAP	Critical Trends Assessment Program
CWS	Community Water Supply
DNR	Department of Natural Resources
DNP	Dedicated Nature Preserve
DOQ	Digital Orthophotoquarter Quadrangle
DRG	Digital Raster Graphics
EPA	Environmental Protection Agency
FGDC	Federal Geographic Data Committee
GAC	Groundwater Advisory Council
GIS	Geographic Information System
GWQS	Groundwater Quality Standard
H2O Works	Waterworks Database
IAWC	Illinois American Water Company
IDA	Illinois Department of Agriculture
ICCG	Interagency Coordinating Committee on Groundwater
IDNS	Illinois Department of Nuclear Safety
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IGA	Illinois Groundwater Association
IGPA	Illinois Groundwater Protection Act
IWWAP	Illinois Water Well Abandonment Program
IRWA	Illinois Rural Water Association
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
MCL	Maximum Contaminant Level
NCPWS	Non-community Public Water Supply
NCWS	Non-community Water Supply
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSDI	National Spatial Data Infrastructure
OCS	Office of Chemical Safety
OSFM	Office of the State Fire Marshal
P2	Pollution Prevention
PMP	Pesticide Management Plan
ppb	parts per billion

ppm	parts per million
PWD	Public Water District
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SIU	Southern Illinois University
SOC	Synthetic Organic Chemical
SOW	Scope of Work
SWAP	Source Water Assessment Program
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Loadings
UIE	University of Illinois Extension
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Chemical
WATER	What Are The Efficient Water Rates
WRAC	Water Resources Advisory Committee
WHPP	Wellhead Protection Program

EXECUTIVE SUMMARY

The Illinois Groundwater Protection Act (IGPA) (P.A. 85-0863, 1987) responds to the need to manage groundwater by emphasizing a prevention-oriented process. The IGPA is a comprehensive law that 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. The IGPA responds to the need to protect groundwater and establishes a unified protection program by:

- Setting a groundwater protection policy;
- Enhancing cooperation;
- Establishing water well protection zones;
- Providing for surveys, mapping and assessments;
- Establishing authority for recharge area protection;
- Requiring groundwater quality standards; and
- Requiring technology control regulations.

The groundwater policy, established by the IGPA, sets the framework for management of groundwater as a 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 Interagency Coordinating Committee on Groundwater (ICCG) is required to report biennially to the Governor and General Assembly on Groundwater quality and quantity, and the state's enforcement efforts.

***Groundwater Importance*:** Good stewardship of our natural resources, such as groundwater, is in the best interest of our state. During 1995, groundwater withdrawals in Illinois averaged 953 million gallons per day (MGD).

Safe and adequate water supplies are vital for public health and necessary for local and regional economic development. There are 5,534 public water supplies in Illinois of which 1,271 are community water supplies that are dependent on groundwater as their source of water. These community water supplies serve approximately 2.8 million people. An additional seven community water supplies utilize a mixture of surface water and groundwater sources. These systems provide approximately one-half million individuals potable water. Furthermore, approximately 400,000 residences in the state are served by private water supply wells.

Groundwater also provides up to 80 percent of the base flow to streams in many areas of the state and is essential to watershed ecology. In 1980 the Illinois State Water Survey (ISWS) publication entitled "Groundwater Discharge to Illinois Streams" indicated that the regions with the highest base flows are in northeastern and southeastern Illinois, with the areas in north-central Illinois yielding the next highest base flow values.

Where is it? In Illinois, the largest amount of groundwater withdrawal is in the northern one-third of the state. In this area, large supplies of potable water are available in aquifers that range in depth from about 10 to 1,500 feet. Approximately 70 percent of community water supplies (CWSs) in the state withdraw water from confined aquifers that have natural geologic protection from surface and near surface activities. However, the remaining 30 percent of the communities withdraw water from unconfined aquifers that are sensitive to pollution from land use.

> In the six county area around Chicago, the deep bedrock aquifer is at a level of sustained yield of 65 MGD, and withdrawals beyond this will mine the groundwater. The Northeastern Illinois Planning Commission's (NIPC) Strategic Plan for Water Resource Management shows that areas are projected to experience water shortages in the future. Furthermore, projections by the ISWS show that, depending on population growth and climate changes, shortages may be exacerbated.

How good is the water? Groundwater quality is a high priority in Illinois. Water quality degradation or contamination resulting from point and nonpoint sources throughout the state is of concern. In many industrialized parts of the state (including the metropolitan areas of Chicago, Rockford, and East St. Louis) groundwater in glacial deposits and bedrock aquifers has been degraded by improperly contained or disposed of chemicals. In some agricultural areas, the quality of groundwater in the underlying shallow aquifers has been degraded by the routine application of agricultural chemicals. Surface water quality has been degraded in some areas because of the influx of contaminated groundwater. The Illinois Environmental Protection Agency (EPA) continues to evaluate the question of how good is the water by implementing an ambient monitoring network of CWS wells, as illustrated in Figure 1. In addition, the Illinois Department of Agriculture (IDA) has implemented a monitoring well network for pesticides in shallow groundwater to assist with implementation of Illinois' Generic Pesticide Management Plan (PMP) that has been endorsed by the United States Environmental Protection Agency (U.S. EPA).

Sixty-five percent of the CWS wells using unconfined aquifers appear to produce high quality groundwater. However, 35 percent of CWS wells relying on these sensitive aquifers have been impacted by groundwater contamination. Figure 1 displays the wells monitored in the Ambient Network of CWS Wells relative to the principal aquifers in Illinois. In addition, this figure relates trends in groundwater for nitrates, volatile organic compounds, and synthetic organic compounds in the network wells. Trends were evaluated as upward (an increase in concentration in one or more contaminant groups), no trend (no detection or inadequate data) or downward (a decrease in concentration in one or more contaminant group).

> A recent ISWS study of Illinois EPA groundwater monitoring data from CWS in northeastern Illinois shows increasing trends of chlorides. In addition, there are naturally occurring contaminants such as arsenic and radionuclides that require treatment in certain parts of the state.

Trends in Groundwater Quality for Community Water Supply Network Wells

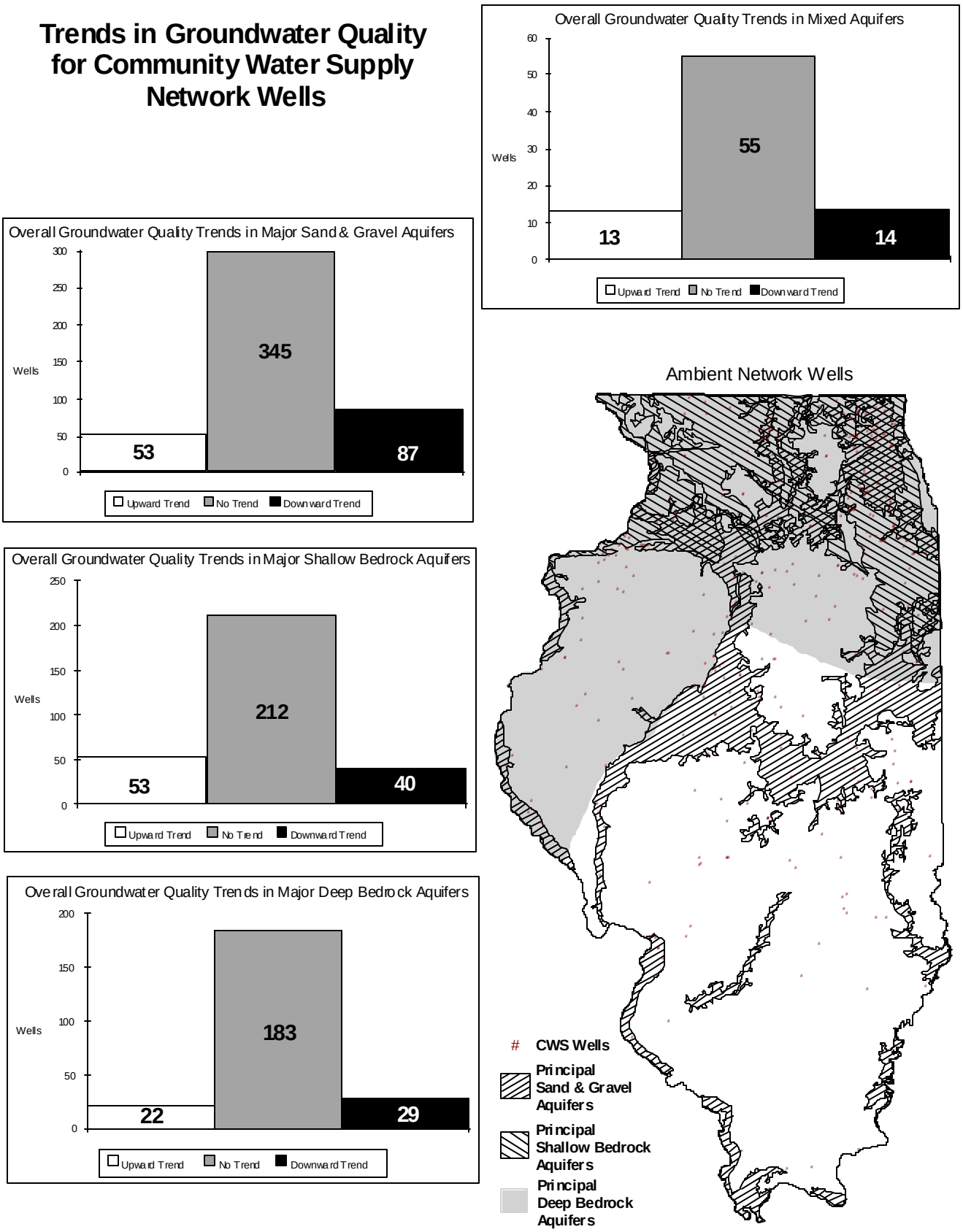


Figure 1. Ambient Network of CWS Showing Trends in Illinois' Principal Aquifers (J. Konzyck, 2001, Illinois EPA)

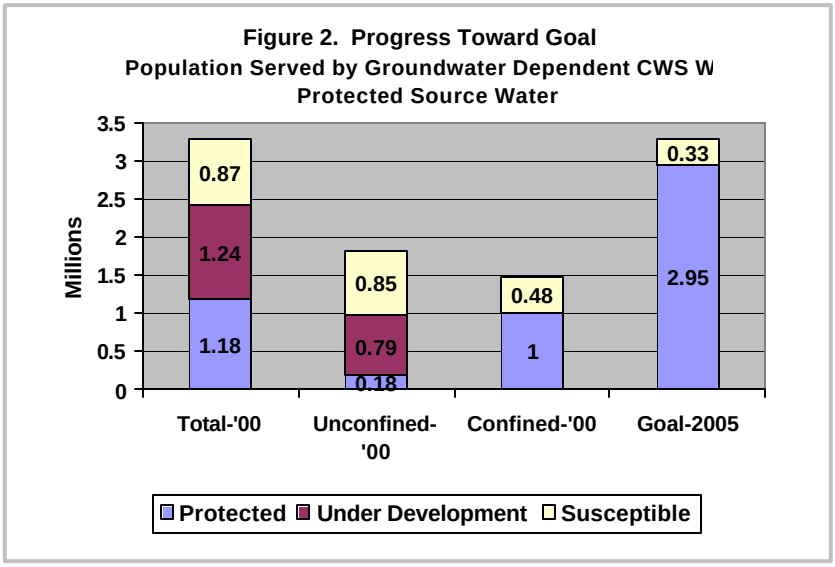
Costs of Contamination: Illinois has, and will, spend millions of dollars on cleaning up contaminated groundwater. For example, the cleanup of groundwater and connection of homes to public water supply could cost millions in Lisle. Furthermore, groundwater contamination has resulted in significant unanticipated costs when the village of Carpentersville expanded its wastewater treatment plant.

> The MTBE contamination of the East Alton CWS may cost in excess of $100,000 per year as long as the current pump and treatment system operates.

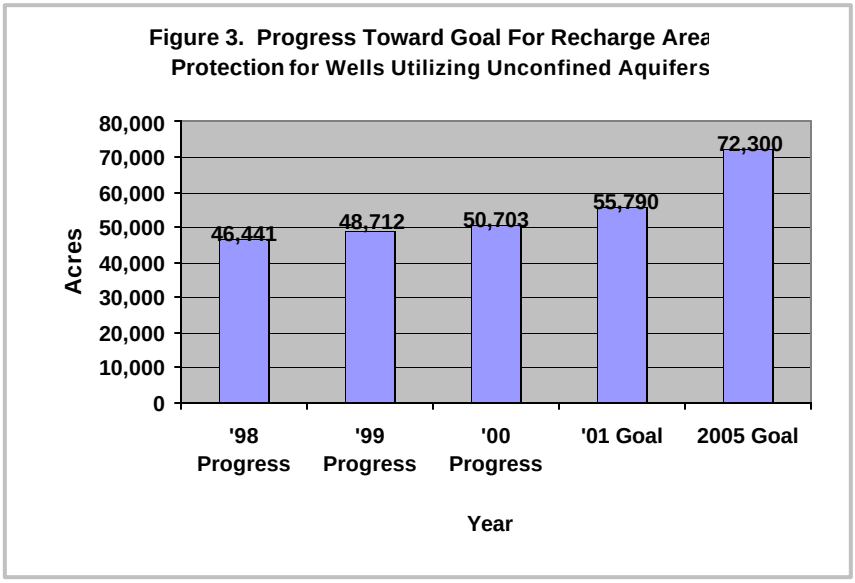
> During 2000 and 2001, the Illinois EPA's Leaking Underground Storage Tank Program reimbursed tank owners and operators approximately $104,000,000 and closed approximately 1,800 sites.

Efforts to Protect Groundwater: Protection of Illinois' valuable groundwater resource is especially critical. As reflected in Figures 2, the Illinois EPA has made considerable progress in groundwater protection through such initiatives as the groundwater standards, Regional Groundwater Protection Planning Programs, and the Safe Drinking Water Act (SDWA) Monitoring Waiver and Consumer Confidence Reporting Programs. Significant groundwater cleanups and restoration efforts have also been implemented that have helped restore groundwater quality.

Illinois continues to address the need for protecting groundwater by accomplishing the mission set forth in the IGPA and through federal, state and local partnerships establishing groundwater protection programs. The IDA through its Illinois FarmAsyst, HomeACRE and FarmLANDS programs has made contamination-risk assessment tools readily available to the general public to allow protective actions to be implemented locally. These partnerships utilize regulatory and non-regulatory programs to achieve success.



Since over one million people in Illinois rely on sensitive unconfined aquifers for their source of drinking water, Illinois has placed added emphasis on the protection of these groundwater systems. The majority of CWS systems in Illinois are considered small systems. Thus, when compared to the overall population of the state, they may appear insignificant. However, when these small systems are adversely impacted by contamination, they often lack the available resources to address these concerns. Unlike larger water supplies, small supplies may not have experts on staff to solve water quality problems or the rate base from which to draw funds for corrective measures. Therefore, protecting the resources utilized by these small water supply systems is critical.



Protecting the land surface areas overlying sensitive unconfined aquifer wells (recharge areas) can help prevent contamination of groundwater. To measure protection program progress for CWS facilities utilizing these sensitive aquifers, the Illinois EPA developed Figure 3. Coupled with the population served, measuring the acres with protection programs under development or in place provides an effective measure of Illinois' progress in protecting these sensitive areas.

Program Summary - 2000 through 2001

Under continuing efforts of establishing prevention-based programs that will reduce the risk of contamination to the contributing recharge areas, the Illinois EPA proposed a Regulated Recharge Area for the Pleasant Valley Public Water District (PWD). The proposal was filed with the Illinois Pollution Control Board (Board) as directed by a petition from the Central Regional Groundwater Protection Planning Committee. This regulated recharge area became the first such regulation adopted in Illinois and will assist others that may want to implement a similar regulation area in the future.

As petitioned, the Illinois EPA proposed the regulated recharge area (R00-17) for the Pleasant Valley PWD wells to the Board.

- Filed February 14, 2000
- First hearing held May 9, 2000.
- First notice published August 10, 2000.
- Second notice published June 7, 2001.
- Final regulation published July 26, 2001.
- Effective date of regulation September 1, 2001.

To further protect groundwater resources, the Illinois EPA developed a proposal to amend Illinois' Groundwater Quality Standards Regulations to include a standard for MTBE. Additionally, the Illinois EPA proposed amendments to the Tiered Approach for Corrective Action Objectives and the Leaking Underground Storage Tank regulations to include MTBE as an indicator contaminant and to establish a cleanup level.

Illinois EPA proposed amending the Groundwater Quality Standards (Proposal R01-14) to include a standard for MTBE.

- Filed August 31, 2001
- First Hearing held March 1, 2001
- Second Hearing held April 5, 2001
- Board published first notice and opinion September 7, 2001

On June 6, 2000, Governor George Ryan announced the establishment of a Water Resources Advisory Committee (WRAC) to look at the issues surrounding water quantity management in the state of Illinois. The WRAC was co-chaired by Brent Manning, director of the Illinois Department of Natural Resources (DNR) and Tom Skinner, then director of the Illinois EPA. The governor invited 25 individuals representing a broad cross section of water users and water suppliers to serve on the WRAC. Between August 31, 2000, and January 9, 2001, the WRAC held a total of five meetings. Meetings included presentations from various Illinois DNR and Illinois EPA staff on a broad range of water issues, followed by discussions amongst WRAC members. The committee worked toward a consensus building process through the identification of numerous issues and concerns regarding the future direction of water resources management and regulation in Illinois. Through the review of the committee's deliberations, an interagency drafting committee prepared legislative language for comprehensive water management entitled "Water Quantity Stewardship Act." This draft legislation was submitted to the WRAC for review and comment. Subsequently, the Groundwater Advisory Council (GAC) and the Interagency Coordinating Committee on Groundwater (ICCG) have been reviewing these documents and related issues to provide input to the Governor's Office.

To protect groundwaters that are particularly sensitive and ecologically vital, the ISWS has continued efforts to delineate the area(s) contributing groundwater to 84 dedicated nature preserves. These efforts are intended to provide the basis for designating areas of the state as Class III: Special Resource Groundwater. Currently, the ISWS has indicated that 11 areas are ready for Illinois EPA review for technical adequacy. Following this process, the areas will be listed in the Illinois Environmental Register.

As part of an ongoing effort to assess the condition of Illinois' groundwater resources, Illinois EPA continued sampling the Ambient Network of CWS wells. In addition, the Illinois EPA has initiated a pilot effort to begin assessing the concentrations of radon and pesticide metabolites (break-down products) in a sub-network of these wells. This initiative is currently being conducted in association with the Illinois Department of Nuclear Safety (IDNS) and the U.S. Geological Survey, respectively. The Illinois EPA is continuing to implement other monitoring efforts (including monitoring new or previously un-sampled CWS wells) as resources allow. This effort led to the detection and ongoing remediation of MTBE in East Alton's well field.

Illinois' generic state management plan for the protection of groundwater from agricultural chemicals was submitted to the U.S. EPA and was subsequently endorsed. The IDA submittal was coordinated through the ICCG. Under the generic agricultural management plan, the IDA, ISWS, and Illinois State Geological Survey (ISGS) continued to sample a dedicated groundwater-monitoring network for pesticide constituents.

Illinois EPA has continued to work with the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), Soil and Water Conservation Districts (SWCD), and other local stakeholders to establish conservation reserve programs for agricultural cropland located within wellhead protection areas. A set of new county scale maps was developed to assist with this effort.

To assist in measuring protection program effectiveness, the Illinois EPA continues to work toward an environmental goal of increasing the percentage of groundwater recharge areas (acres) with protection programs established or under development to 45 percent by the year 2005. To date, Illinois communities have achieved 70 percent of this goal. Furthermore, the Illinois EPA continues to strive for achieving a goal of 90 percent of the state's population utilizing CWS groundwater sources, with protection programs in place, or under development, by the year 2005. Statewide technical assistance to communities has been expanded to include the delineation of recharge areas and conducting source inventories within these areas. Recharge areas are being delineated, and any potential sources of groundwater contamination are being inventoried for CWSs using groundwater from unconfined aquifers. Coordination and technical assistance from the Illinois Rural Water Association (IRWA) has also been provided to establish local teams for development of local groundwater protection programs. To assist with meeting this goal, the Illinois EPA established contracts with four state universities to conduct recharge area delineations for 111 CWSs.

Under the Illinois EPA's source water assessment program (SWAP), approved by U.S. EPA, the Illinois EPA has worked with the U.S. Geological Survey (USGS) to develop an Internet-based geographic information system (GIS) to provide the public with access to groundwater assessment and protection data. Source water assessment and protection program data is now available over the Internet at http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html. This information will allow for the development and application of a balanced management plan for the protection of groundwater resources.

Please note: Due to security concerns resulting from the events of September 11, 2001, the Illinois EPA has temporarily removed this website from public availability.

Assessment of risks to public non-community water supply (NCWS) wells has been greatly expanded through resources committed by the SDWA's Source Water Assessment Program (SWAP). Specifically, wellhead assessments for NCWS wells have been greatly expanded during the past two years. As of June 2001 a total of 3,639 of the 4,100 public NCWS source water areas had been scanned, registered, rectified and digitized. The field verified location of NCWS and CWS wells is also being indexed to the ISGS's geological well log database. This will allow the capability for all the state agencies to access this information electronically.

The Regional Groundwater Protection Planning Committees have made very good progress, and continue to receive national recognition for their efforts. The Illinois EPA, the Illinois DNR and other stakeholders have continued to work with the Regional Groundwater Protection Planning Committees to evaluate the need for a regional aquifer assessment in Northeastern Illinois. McHenry county is in the process of developing a Groundwater Resources Management Plan. In addition, Lake and Kane counties are also planning development of a comprehensive groundwater protection plan. Illinois agencies and departments have continued assisting and providing guidance to local community officials developing groundwater protection programs.

To assist stakeholders, the Illinois EPA, ISWS, and ISGS have developed a *Groundwater Protection Needs Assessment Guidance Document*. The IRWA, environmental consultants, government officials and other planning groups are continuing to use this document as a technical assistance tool. Since the guidance has been developed, several communities have utilized it to conduct comprehensive assessments.

> A groundwater protection needs assessment defines the critical recharge area(s). The assessment also identifies the existing potential contamination sources and/or potential routes located in this area. It then relates this information to the existing land use and zoning information.

Fourteen years after the IGPA was passed into state law, the Illinois DNR continues an aggressive groundwater education program. Significant progress has been made in overcoming deterrents to groundwater protection. In 17 priority counties, middle school teachers were targeted for workshops, hundreds of groundwater flow models were built, and local technical support was developed and applied. Furthermore, the Groundwater Protection Education Program has successfully been adapted to changing needs, helped to integrate groundwater protection into existing programs, and secured the participation of many agencies and associations.

2001 Through 2002 Recommendations

The recommendations contained within this section are based, in part, on input and interaction with the ICCG, GAC, WRAC, Regional Groundwater Protection Planning Committees, Source Water Protection Technical and Citizens Advisory Committee, Northeastern Illinois Planning Commission-Water Supply Task Force, and the McHenry County Groundwater Protection Steering Committee. Furthermore, these recommendations continue to consider the input from Policy Forums on Regional Groundwater Protection.

- Per the request of the Governor's Office, review and make recommendations regarding groundwater quantity issues for the next legislative session;
- Continue to promote groundwater protection and pollution prevention (P2) programs;
- Market the Internet Geographic Information System (GIS) to encourage protection and restoration programs;
- Continue to enhance and improve the Internet GIS and post completed source water assessment and protection fact sheets;
- Update the ICCG's Groundwater Research Plan;
- Establish an ICCG Subcommittee to evaluate regional contamination issues and public notification;
- Continue to participate in McHenry County Groundwater Resources Management Plan Steering Committee;

- Promote the ongoing research and marketing efforts of the IDA being conducted through its Save Our Illinois Soils (SOILS) and What Are The Efficient Rates (WATER) projects;
- Illinois EPA will continue to work with the Natural Resources Conservation Service (NRCS), Soil and Water Conservation Districts (SWCD), and other local stakeholders to establish conservation reserve programs for agricultural cropland located within the delineated recharge areas of CWS wells;
- The Illinois EPA, IDA, Illinois Association of SWCDs, and the County Soil and Water Association Districts should continue to work together to implement *Illinois FarmAsyst* and related programs in source water protection areas;
- Efforts to expand the Illinois Water Well Abandonment Program (IWWAP) should also be evaluated;
- Modify CWS water well construction permit application procedures to include consideration of existing groundwater contamination sources and potential sources and routes; and
- Enhance coordination between Illinois EPA Bureau of Water (BOW) and Land Remediation Programs.

BIENNIAL COMPREHENSIVE STATUS AND SELF-ASSESSMENT REPORT

INTRODUCTION AND BACKGROUND

The intended purpose of this report is threefold. First, the report is intended to provide a comprehensive status report on the implementation of the Illinois Groundwater Protection Act (IGPA). Secondly, the report is intended to provide a self-assessment of program initiatives in relation to the goals and objectives of the program recommended in the IGPA Biennial Report, published January 2000. Finally, this report is intended to provide environmental and programmatic indicators to help measure and demonstrate program performance.

The current report has been organized according to the following recommended goals:

- Interagency Coordinating Committee on Groundwater (ICCG) operations;
- Groundwater Advisory Council (GAC) operations;
- Groundwater protection education program;
- Groundwater evaluation program;
- Groundwater quality standards and technology control regulations;
- Groundwater quantity issues;
- Wellhead protection program (WHPP);
- Regional groundwater protection planning program;
- Non-community and private well program overview;
- Enhanced non-community well program initiatives; and
- Enhanced private well program initiatives.

CHAPTER I.
INTERAGENCY COORDINATION COMMITTEE ON GROUNDWATER OPERATIONS

Section 1. Continue to review and update the Implementation Plan and Regulatory Agenda

The IGPA required the creation of the ICCG. The ICCG is required to report biennially to the governor and General Assembly on Groundwater **quality** and **quantity**, and the state's enforcement efforts. In summary, the ICCG is responsible for:

- Reviewing and coordinating the state's policy on groundwater protection;
- Reviewing and evaluating state laws, regulations and procedures that relate to groundwater protection;
- Reviewing and evaluating the status of the state's efforts to improve the quality of the groundwater and of the state enforcement efforts for protection of the groundwater and make recommendations in improving the state efforts to protect the groundwater;
- Recommending procedures for better coordination among state groundwater programs and with local programs related to groundwater protection;
- Reviewing and recommending procedures to coordinate the state's response to specific incidents of groundwater pollution and coordinate dissemination of information between agencies responsible for the state's response;

- Making recommendations for and prioritizing the state's groundwater research needs; and
- Reviewing, coordinating and evaluating groundwater data collection and analysis.

The Committee is chaired by the director of Illinois Environmental Protection Agency (EPA) or designee and has members from 10 state agencies/departments that have some jurisdiction over groundwater. The ICCG continues to review and update an Implementation Plan and Regulatory Agenda pursuant to the IGPA. The following is a list of participating agencies/departments on the Committee:

- ENVIRONMENTAL PROTECTION AGENCY - (Chair) Marcia Willhite, designee
- DEPARTMENT OF NATURAL RESOURCES - Dave Baker, designee
  - OFFICE OF WATER RESOURCES - Gary Clark, designee
  - OFFICE OF MINES AND MINERALS - Dan Wheeler, designee
- DEPARTMENT OF PUBLIC HEALTH - Dave Antonacci, designee
- OFFICE OF THE STATE FIRE MARSHAL - Bill Alderson
- DEPARTMENT OF AGRICULTURE - Warren Goetsch, designee
- EMERGENCY MANAGEMENT AGENCY - Julia Gentile, designee
- DEPARTMENT OF COMMERCE AND COMMUNITY AFFAIRS - David Kramer, designee
- DEPARTMENT OF NUCLEAR SAFETY - Dave Ed, designee

Also attending the ICCG meetings are: John Washburn representing the Illinois Department of Transportation's Division of Highways; Angel Martin representing the U.S. Geological Survey; Harry Hendrickson, ICCG Groundwater Education Coordinator; Alan Wehrmann representing the Illinois State Water Survey and Ed Mehnert representing the Illinois State Geological Survey.

Section 2. Continue to hold quarterly meetings

The ICCG continues to hold quarterly meetings. The Committee has met regularly since 1988 to address groundwater protection issues.

Section 3. Provide liaison for the GAC

The ICCG has continued to assist with coordination associated with the GAC by providing Committee meeting agendas and minutes. The ICCG has also continued to review and make recommendations on groundwater research, data collection, and dissemination programs. The Committee has been successful in coordinating and assisting in many aspects of the groundwater protection program.

The ICCG, as well as its subcommittees and work groups, have helped to provide a cooperative process to develop and implement groundwater protection programs.

Section 4. Continue to assist with implementation of a fully integrating CSGWPP vision statement and proposed changes in U.S. Environmental Protection Agency policies and programs in support of the vision statement

In 1993, the United States Environmental Protection Agency (U.S. EPA) provided the states with Final Guidance on the Comprehensive State Groundwater Protection Program (CSGWPP). Under this program, the state has been handed the lead role in groundwater protection. The U.S. EPA guidance contained six strategic activities for two different levels of a CSGWPP. These strategies are outlined in the July 1996 Illinois Core CSGWPP Application. Implementation of at least one program is all that is required to meet the lowest or Core level criteria. The Internet/Intranet Geographic Information System (GIS) is being used to integrate other agency program data including: 305(b) data and information; discharge monitoring data; Resource Conservation and Recovery Act sites; Superfund sites; landfills; voluntary cleanup sites; leaking underground storage tank sites; and toxic release inventory sites. In addition, the Illinois EPA has integrated the Illinois State Geological Survey (ISGS) geological well log database. This system provides for better program coordination. Furthermore, the Bureau of Water (BOW) is working on coordination of total maximum daily loadings (TMDL) and surface water /groundwater interaction monitoring.

Section 5. Oversee, review and provide input to the preparation and implementation of a Generic Management Plan for Pesticides in Groundwater

The *Illinois Generic Management Plan for Pesticides in Groundwater* was submitted to the U.S.EPA in June 2000. U.S. EPA concurred with the plan in February 2001.

Section 6. Review and support the annual groundwater education work plan

The ICCG's Education Subcommittee continues to actively implement statewide groundwater educational efforts and has worked with the four Groundwater Protection Planning Committees to establish local groundwater programs. The Education Subcommittee, chaired by the Illinois Department of Natural Resources (DNR), has conducted a program that addresses groundwater related topics to educate the general public, business, agriculture, government, and private water supply owners, users, and operators. The ICCG reviews and provides input on the Groundwater Education Work Plan.

Section 7. Evaluate the development of Class III Special Resource Groundwater for Dedicated Nature Preserves

To date, one dedicated nature preserve (DNP), Parker Fen, has been designated as having Class III Special Resource Groundwater. The Illinois State Water Survey (ISWS) has worked on the delineation of the contributing recharge area of an additional 84 DNPs during the past two years. During May 2001 the ISWS met with the Illinois EPA to review their methodology. The ISWS and Nature Preserve Commission will be petitioning the Illinois EPA to designate the area contributing groundwater to these nature preserves as Class III groundwater.

Section 8. Review regulated recharge area proposals

The ICCG assisted in the adoption of the Pleasant Valley Public Water regulated recharge area and will assist in future proposals as they occur.

CHAPTER II. GROUNDWATER ADVISORY COUNCIL OPERATIONS

Section 1. Conduct policy related meetings

The GAC conducted several policy related meetings over the past two years. The GAC is comprised of nine members who represent public, industrial and local government interests. The IGPA mandates that the council members be appointed by the governor to serve three-year terms. The current members are as follows:

- Bill Compton (Chair) - Caterpillar, Inc.
- Vacant - Public Water Supply Representative
- Vacant - Environmental Interest Representative
- Harold Reetz - Potash and Phosphate Institute
- Paul McNamara - Southwestern Illinois Planning Commission
- Robert Millar - Retired, Hamilton Sunstrand
- Fred Walker - South Central Illinois Regional Planning and Development Comm.
- John Liberg - Illinois Association of Groundwater Professionals
- Robert Kohlhase - Farnsworth Group

Section 2. Provide input to programs, plans, regulatory proposals, and reports as appropriate

The GAC should be acknowledged for their input and support of the adoption of Illinois' first regulated recharge area. The GAC provided for balance interest group perspectives that led to the adoption of the Pleasant Valley Public Water regulated recharge area. These efforts will assist in further implementation of regulated recharge areas and groundwater protection in Illinois.

CHAPTER III. EDUCATION PROGRAM FOR GROUNDWATER PROTECTION

Section 1. Coordinate and conduct a statewide education program with an annual evaluation and work plan involving local, regional and state organizations and agencies. Support the integration of groundwater protection into state and local agency educational programs.

While recognizing this as an ongoing program, this goal has been largely achieved. Annual evaluations were conducted by a survey of a stratified sample of 150 persons involved in groundwater protection. Each survey polled equal numbers of representatives of the five audiences focused on by the Groundwater Education Program. In both years, Illinois teachers were rated the highest priority, and the business audience was rated lowest. Based on these surveys, annual planning meetings, and input from agency and association representatives, annual groundwater protection education work plans were developed, presented to the ICCG and GAC for approval, and regularly reviewed.

For fiscal year 2002, the work plan coordinates the educational work of 30 agencies, 18 associations, and 11 committees representing certain geographic areas or groundwater constituencies. The work plan addresses five audiences: the general public, well owners, water professionals and officials, business, and Illinois teachers. Each audience is addressed by a section of the work plan, which itemizes materials and services planned, the lead agency or association, a planned completion date, and a progress report. Each year, completed projects are moved to an accomplishments section of the work plan that has become lengthy over the 14 years since the IGPA was passed. Since many of the short-term projects and publications have been completed, the work plan now is laced with "ongoing" services, though many of the publications need to be improved and updated.

Since 1988, the annual work plans have evolved a great deal. Originally, the education program focused heavily on informing water officials and professionals about the various provisions of the law. A groundwater speakers bureau made numerous presentations to community service organizations. A groundwater science award program was established with the Illinois Groundwater Association (IGA) to recognize applications of this emerging young science. Three statewide workshop series were conducted to bring current program information to professionals.
As various elements of the act were institutionalized and rules adopted, emphasis has switched to communities, regionally sponsored events, well owners, and Illinois teachers. Regional field days emphasize local groundwater protection challenges and opportunities, and the Shining Star Awards Program identifies and promotes community successes. Several agencies and associations cooperate in staffing a Water Well Clinic at the two Illinois state fairs where well owners get professional advice about their private water supplies.

Illinois teachers (and ultimately their students) are key targets for the message that groundwater is part of the water cycle and that groundwater science can be readily taught, demonstrated, and understood, provided improved techniques and materials are used. The teacher-pyramidal effect is illustrated in that most science instructors teach at least 100 students a year over a 30-year career. During the past two years, heavy emphasis was placed on groundwater workshops at the county or Regional Office of Education level, with locally generated funding.

A special, in-depth Near and Far Science in Illinois--Groundwater course was established with funding from the Illinois State Board of Education. With more than 600 groundwater flow models placed in Illinois schools (mostly through locally raised funds), special maintenance and rebuilding workshops were conducted at various meetings of science teachers.

Agency programs have integrated groundwater science and protection in many ways, and the education program has supported this institutionalization. At least seven communities have adopted special land use regulations to protect groundwater, and over 100 have adopted maximum setback zones protecting over 300 wells. The monitoring waiver program developed by Illinois EPA in cooperation with the Illinois Municipal League recognizes and rewards local government groundwater protection actions by reducing water monitoring frequencies and costs. Agencies now include groundwater protection zones and karst areas in their review, permitting, and/or funding of various projects. United States Geological Survey (USGS) Circular 1139, Ground Water and Surface Water: A Single Resource, 1999, shows linkages of surface and groundwater and provides a scientific foundation for policy development and their unified management.

Probably the greatest deterrent to sound groundwater protection programs is a lack of understanding of groundwater science. Groundwater is out of sight and out of mind. When most Illinois citizens were in school, groundwater was not taught as part of the water cycle, nor were its vulnerability to contamination, its vital role in the health of Illinois citizens, nor its terribly undervalued importance to the Illinois economy. This deterrent can be overcome through:

- the simple inclusion of groundwater as part of the water cycle in the school curriculum;
- provision of groundwater hydrology teaching methods and models, preferably through county or regional workshops;
- the use of local or Illinois examples of groundwater problems and solutions (a balance of both "scare" stories to get citizens' attention, and "success" stories to show rational, science-based protective practices or solutions);
- a unified educational approach from all agencies (largely assured by IGPA, ICCG, and GAC); and
- localized or personalized source water or contaminant information (which can be made available at internet speed.)

Fourteen years after IGPA and this education program were created, great progress has been made at overcoming deterrents to groundwater protection, but mostly in the 17 counties that were targeted by the program. In these counties, middle school teachers were targeted for workshops, hundreds of groundwater flow models were built, and local technical support was developed and applied. As new groundwater protection committees are organized in Illinois' remaining 85 counties, and as financial and staff resources are developed, this program will provide similar services to them.

Summarizing, the Groundwater Protection Education Program has successfully been adapted to changing needs, helped to integrate groundwater protection into existing programs, and secured the participation of many agencies and associations, but primarily in the limited target areas.

Section 2. Support regional groundwater protection committees with special education programs based on regional needs. Emphasize programs for wellhead protection involving local water, planning, and health authorities.

In addition to the previously established Northern, Central, Southern, and Northeastern Regional Groundwater Protection Planning Committees, the Mahomet Aquifer Consortium (MAC) was established in this biennium. Unlike the regional committees selected by the state, based on groundwater vulnerability and other factors, the MAC was developed to focus research, monitoring, assessment, and educational programs on the management of the Mahomet Aquifer. A groundwater quality problem exists in the western part of the Mahomet Aquifer where naturally high levels of arsenic are found.

Starting in 1993, groundwater education workshops (utilizing groundwater flow models and the H_2O Below activity book for middle school teachers) were conducted for teachers in the 15 designated counties. In this biennium, programs were completed in Kendall/Grundy and Kankakee/Iroquois counties (Grundy and Kankakee were included based on Regional Office of Education boundaries). Each program was a series of at least five development meetings culminating in a workshop with trained local teacher/mentors using classroom-tested activities to teach middle school teachers. Each teacher created a groundwater flow model representing the hydrogeology under their community, and identified local health, water, planning and community education professionals. The activity book and teaching methods were developed through a W.K. Kellogg Foundation grant of $500,000 to Southern Illinois University (SIU) at Edwardsville. When the grant expired in 1998, teachers in 11 counties covered by the original designated regional areas had been provided this service. After the grant expired, the project was continued at the local level with strong support of the Northeastern Regional Groundwater Committee, regional offices of education, DNR, Illinois EPA, and many supporting agencies and associations.

Due to the delay in designating the next regional groundwater committee, the program has assisted the Mahomet Aquifer Consortium with educational activities, and more are planned. The MAC education committee selected areas with high natural arsenic levels as the highest priority area for educational efforts, but other opportunities will also be explored. Proposals for revisiting the Northern Region with groundwater workshops for teachers were developed through the regional committee. Groundwater workshops for teachers in Madison and St. Clair counties in the southern region were conducted at teacher institutes. In the central region, student and teacher workshops were conducted in association with the Clean Water Celebration, sponsored by the regional groundwater committee and many others.

Section 3. Through educational institutions and organizations, curriculum projects, and teacher workshops, integrate groundwater principles and groundwater protection into the curriculum for grades 3-12, emphasizing correlation with Illinois Learning Standards.

Since the Illinois State Board of Education adopted Illinois Learning Standards in July of 1997, the process for integrating groundwater principles into the curriculum has become considerably easier since there is clear direction on when various topics are taught in the schools. Specific Learning Standards which apply directly to groundwater protection education are listed below:

Goal 11 - Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems;
Goal 12 - Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences;
Goal 13 - Understand the relationships among science, technology and society in historical and contemporary contexts;
Goal 16 - Understand events, trends, individuals and movements shaping the history of Illinois, the United States and other nations: Understand Illinois, United States and world environmental history; and
Goal 22 - Understand principles of health promotion and the prevention and treatment of illness and injury.

Within each goal a matrix of standards and benchmarks are arranged by five levels from early elementary to high school. Since these standards cover the areas of science, social studies, and health education, there are ample opportunities for integrating the relatively new science of groundwater in various areas and working across disciplines.

Funding was established in FY2001 through the Illinois State Board of Education for the Near and Far Science for Illinois–Groundwater Science (NFSI-GW) Course. An experimental course was developed and taught to 18 science teachers from throughout Illinois. Five graduate credits were granted on completion of the course through Aurora University. The course description and objectives were correlated to the Illinois Learning Standards and Illinois Content-Area Standards for Educators. The course was conducted over four Friday/Saturday sessions that emphasized Illinois groundwater experience and applications, field methods, and teaching methods. Starting with well reports, each teacher created a groundwater flow model representing the geology of their area. Field trips were conducted to a karst area, sinkhole, cave, well drilling operation, water and wastewater treatment facilities, landfill, urban developments, and historic farmstead. NFSI-GW culminated with a State Capitol showcase, where teachers successfully demonstrated projects they developed with their students for their communities. Several teachers also demonstrated their work at community and regional groundwater meetings. In addition to ISBE funding and staff support from three regional offices of education, the following agencies and associations provided support for this experimental course: DNR, ISWS, ISGS, Illinois Department of Public Health (IDPH), Illinois School for the Visually Impaired, SIU at Edwardsville, Springfield City Water Light and Power, Monroe and Macon County Health Departments and Soil and Water Conservation Districts (SWCD), Macon County Conservation District, Illinois Association of Groundwater Professionals, and Illinois Pork Producers Association. Evaluations from the participating teachers were very positive and recommendations were made for improvements. When funds are available to repeat this type of course, these initial teachers will probably be directly involved as teacher trainers.

Presentations and exhibits were made at all meetings of the Illinois Science Teacher's Association and many regional or county teacher institutes. During this biennial period, about 4500 groundwater posters, 1500 rain gauges and 1900 hydrologic budget meter sticks were distributed at these events. In each presentation the concepts of local recharge, water testing, and soil as a groundwater filter were presented. All new materials produced have referenced appropriate Illinois Learning Standards, and plans were developed to enter all existing curriculum materials into a statewide database operated by Western Illinois University.

Besides the Buried Treasure and H_2O Below curriculum projects developed through this program for Illinois, the national Project WET (Water Education for Teachers) curriculum project (administered in Illinois by DNR) was integrated with the teacher training workshops whenever possible. WET has several excellent groundwater learning activities that teachers find very useful and can easily be adapted to Illinois conditions.

In addition to about 30 days per year invested in teacher training sessions, another 40 days per year were devoted to field days sponsored by local extension offices, SWCDs, and health departments. Annually, these reach about 8000 students, 400 teachers, and 700 other adults from over 50 counties, with a presentation featuring groundwater science and protection. Each field day teacher is provided with teaching materials and techniques to follow up on the field presentation with classroom activities.

Section 4. As groundwater recharge maps are published for community water supplies, provide educational provide educational programs to improve understanding and to develop community actions involving teachers and students.

The Illinois Rural Water Association's (IRWA) program of technical assistance to small community water suppliers, with U.S. EPA and Illinois EPA funding, has provided support to many communities in developing their source water protection programs. A five-step program is followed which results in a source water protection assessment and plan developed with community outreach and input.

Also, the Community Groundwater Education Collaboration of 17 persons from eight organizations was developed to support community based education programs. A packet was developed which lists available help, provides suggestions for starting a local committee, and makes outreach recommendations. The collaboration advocates the startup of a community-based educational process following the professional delineation and local review of the capture zone maps for a community's wells. This packet was distributed to communities with newly delineated capture zones by Illinois EPA. The packet is particularly useful when Illinois Department of Transportation (IDOT) highway signs are erected announcing "Entering Water Supply Protection Area." To date, IDOT has placed signs in 51 communities and in the sinkhole plain area.

Illinois EPA compiled a summary comparison of groundwater protection ordinances from seven Illinois communities, a very helpful educational and ordinance advocacy tool. It is distributed with a detailed 148-page manual entitled Groundwater Protection by Local Government, developed by the Illinois Section of the American Planning Association and the University of Illinois with support by Illinois EPA and DNR. An accompanying University Extension Land and Water Circular #18, entitled Community Water: How Local Communities Can Protect Their Water is distributed freely to community leaders at meetings of the Illinois Municipal League, Township Officials of Illinois, and the Illinois Association of County Board Members.

Gardening in Your Capture Zone, a brochure offering "do's" and "don'ts" related to home activities, was published by DNR for free distribution both to homeowners with private wells and to residents of community well capture zones. The brochure refers readers with specific questions to local water, health, extension, and SWCD offices.

Several communities have developed education programs specifically for landowners and businesses in their wellhead protection areas. Businesses have been provided pollution prevention (P2) service interns in some areas and educational seminars in others. In East Dundee and Crystal Lake, volunteers from schools and senior service organizations canvassed these areas, provided information to residents, and reported findings to the municipal governing board. In a number of American Bottoms communities, students stenciled water quality reminders on storm sewers. In many other areas, local media featured groundwater protection maps and initiatives. In East Peoria, a high school GIS class assisted the city public works department with global position system mapping of infrastructure, wells, potential sources, and potential routes in the delineated capture zone for its community water supply (CWS).

Section 5. Organize and conduct educational programs for private well owners, involving licensed water well contractors, local health departments, soil and water conservation districts, University of Illinois–Extension offices, and other organizations. These programs will address well abandonment, nitrogen and pesticide management, wellhead protection, disinfection, testing, operation and maintenance methods.

Working through SWCDs and with support from Illinois EPA, the Illinois Department of Agriculture (IDA) and University of Illinois Extension (UIE) Service have secured and promoted the 116-page manual HomeACRE, which provides a voluntary evaluation of home health and environment. Thousands of copies have been distributed through workshops and other events. Field events on host farms and water testing kits are often incorporated into these events.

The Illinois Association of Groundwater Professionals published the Water Well Disinfection Procedures Manual, in 1997. It documents a number of possible methods of disinfecting wells and advocates utilizing the services of a licensed water well professional in inspecting and correcting problem water wells.

Groundwater protection exhibits and **water well clinics** were staffed by health agency, water association, and DNR staff during 20 days of the two state fairs. Private well owners, often with children, are the primary audience and they appear to be very appreciative of the advice and materials that are distributed. The IDA installed a groundwater protection display and three model wells in the new Watershed Park at the Springfield State Fairgrounds.

The Illinois Water Well Sealing Coalition, consisting of about 30 organizations and 10 agencies, strongly advocated the sealing of abandoned wells. Well sealing demonstrations were conducted in over 90 counties through DNR grants to the Association of Illinois Soil and Water Conservation Districts, starting in 1993. Recently the Coalition developed a policy statement and legislative proposal to secure state cost-share, administrative, and educational funding to seal abandoned wells. In response to a resolution of the Association of Soil and Water Conservation Districts, the IDA included well sealing as a cost-shareable practice in its docket of conservation practices, but no additional funding was provided. Jasper County developed its own modest cost-share program and secured demonstrations of well sealing in each township of the county. Lockport Township secured Community Development Block Grant funding and paid a contractor to locate and seal over 250 abandoned wells in the immediate vicinity of its community wells. The coalition maintains a web site about sealing abandoned wells: http://dnr.state.il.us/orep/inrin/eq/well/trial.htm

The Illinois Association of Groundwater Professionals with IDPH support conducted training for licensed water professionals including pump installers, water well contractors, and plumbers. Recently passed legislation requires six hours of IDPH approved continuing education for each group related to water well and pump procedures.

Three key web sites designed for private well owners provide very useful and printable information on well construction, testing, maintenance and protection, as well as current issues.

National Groundwater Association: http://www.wellowner.org
Illinois Association of Groundwater Professionals: http://www.iagp.org
IDPH: http://www.idph.state.il.us

Section 6. Maintain an easily readable and useful newsletter and closely related electronic bulletin board for communication with the newsletter editor, communicators, water professionals, committee persons, educators, and agency representatives with groundwater protection interests. Secure interesting articles from these clients for publication.

Due to budgetary and staffing limitations, the Groundwater Gazette has not been published since May 2000. Information is distributed through state, regional and local association newsletters, e-mails, list servers, web pages, and committees, as needed and appropriate. If and when constraints are eased, a high priority would be placed on electronic rather than paper media for distribution of information. A number of association or agency newsletters would be targeted for groundwater protection information.

Section 7. Secure funding to continue the Illinois Middle School Groundwater Education Project and other educational projects identified in the annual work plan.

Although various funding proposals were turned down, the regional groundwater committees have supported and secured support for the continuation of this program. During this biennial period, these projects were completed for Kendall and Grundy, then for Kankakee and Iroquois county middle school teachers. The regional offices of education, local health departments, SWCDs, water and wastewater utilities, farm organizations, and well contractors have supported the project with funding and staffing resources. When funding was available through the W.K. Kellogg Foundation, four or more counties and 250 teachers were addressed each year, but now with very limited funding, one or two counties and 35 teachers per year are provided this service.

Funding was secured through the Illinois State Board of Education for the Near and Far Science for Illinois–Groundwater Science course (see Section 3 above), which resulted in 18 trained facilitators for the Groundwater Project. The Illinois DNR-Education Division provided financial support for the Project WET elements in this course.

Finally, the Mahomet Aquifer Consortium committed to provide limited funding and staff resources to help develop educational programs for schools in its area. Iroquois County teachers were provided the first Middle School Groundwater Project workshop in this area in March 2001. A colorful description of this model project can be seen at http://www.ikan.k12.il.us/groundwater.

CHAPTER IV. GROUNDWATER EVALUATION PROGRAM

Section 1. Continue to share GIS coverages in an electronic format and continue to automate the groundwater resource database for Illinois

The Illinois Natural Resources Geospatial Data Clearinghouse (Illinois Clearinghouse) is an Internet catalog of free, downloadable, geographically referenced digital data and imagery for Illinois. The project is a multi-agency effort by the Illinois DNR Scientific Survey divisions and is associated with the Federal Geographic Data Committee's (FGDC) National Spatial Data Infrastructure (NSDI) clearinghouse. The data are applicable to a wide range of natural resource issues, including water quality and availability, soil conservation, mineral resource availability, and land cover. Available data sets and documentation (metadata) include: Digital Raster Graphics (DRG) files, 1998/1999 Digital Orthophotoquarter Quadrangles (DOQs), geology, water resources, nature preserves, wildlife areas, land use, political boundaries, roads, census information, and Public Land Survey. Other features include a metadata generation tool, information about metadata and GIS workshops in Illinois, and year 2000 Orthoimagery for the Des Plaines River Watershed. During the first year of DOQ file availability, a total of 43,450 files have been distributed on-line. About 5,000 DOQ files are being downloaded per month. The Illinois Clearinghouse can be accessed on-line at http://www.isgs.uiuc.edu/nsdihome.

The ISWS placed the contents of their Private Well Database (PWDB) on the Internet on July 1, 2001. The PWDB contains information on over 300,000 water wells, principally used for domestic supply. Contents include the ISWS and ISGS well identification numbers, well location (by quarter-quarter-quarter section), driller name, date drilled, well depth, the type of paper record used to generate the database record (e.g., well construction report, chemical analysis), water supply use (e.g., for domestic supply, irrigation supply, monitoring well), well type (dug or bored, drilled, driven), aquifer type, static and pumping water levels when well was drilled, and pumping rate and length of time pumped when pumping water level was measured. Web access is free to all users (http://web.sws.uiuc.edu/gwdb/) but is presently limited to one section (one square mile) at a time.

Section 2. Continue to conduct groundwater assessments and share the information through regular updates and completed reports.

The departments and agencies responsible for these activities include ISGS, ISWS, Illinois EPA, and DNR Office of Water Resources.

ISGS/ISWS Groundwater Assessments

The Scientific Surveys have been involved with a variety of activities throughout 2000 and 2001.

In 2000 and 2001, staff from the ISWS and ISGS continued to serve the Mahomet Aquifer Consortium (MAC) as technical advisors. The MAC was formed in November 1998 to "*...further study the Mahomet Aquifer on a regional basis and to develop a plan for the management of this valuable resource*." The MAC is composed of members from water authorities, water companies, local, county, and state agencies, and the general public, all with an interest in maintaining an adequate and good quality water supply from the Mahomet Aquifer.

Over the last two years, the ISWS has made a concerted effort to continue collecting data on the Mahomet aquifer while the MAC works to secure federal funding for an aquifer-wide study. In June 2000, the ISWS added two more observation wells to the Mahomet Aquifer Network. These wells are located near the towns of White Heath and Cisco and are 297 and 268 feet deep, respectively. The observation well network now contains 97 wells, most of which are measured on a quarterly basis. In addition, during the summer of 2000, the ISWS collected water samples from 21 wells (12 private wells, eight observation wells owned by the city of Decatur, and the new ISWS observation well at White Heath) in an area just west of the Piatt-Champaign counties line. Based on a 1994 review of historical groundwater quality data by the ISGS, it has been theorized that the Mahomet Aquifer is being recharged from underlying bedrock containing groundwaters of relatively high salinity in this area. These recent ISWS sampling results add support to this hypothesis. Finally, during the spring of 2001, an ISWS review of recently discovered data with funding from the city of Decatur, has provided evidence of a hydraulic connection between the Mahomet aquifer, the overlying Glasford aquifer, and the Sangamon River in the vicinity of Allerton Park in Piatt County. The results of this investigation suggest that operation of Decatur's Cisco well field has a direct influence on flow in the Sangamon River, thereby greatly reducing the effectiveness of pumping the water into the Sangamon River for delivery to Lake Decatur (Roadcap and Wilson, 2001).

The Illinois DNR Critical Trends Assessment Program (CTAP)-- The primary goal of CTAP is to conduct statewide and regional assessments of environmental conditions. Under this program, the geology and water resources of many Illinois watersheds have been described. In 2000 and 2001, the following watersheds have been completed– Lower Des Plaines River; Calumet; Lower Sangamon River; Vermilion River (Illinois River Basin); Kinkaid; and the Chicago River/Lakeshore. All of the technical volumes for these areas have been printed and are available from the DNR clearinghouse, http://dnr.state.il.us/orep/c2000/assessments/.

A major goal of ISGS geologic mapping is to define groundwater resources and to protect groundwater quality. The ISGS completed mapping in Jo Daviess and Lawrence counties in 2000 and produced a set of geologic maps including maps of bedrock geology and aquifer sensitivity.

With funding from the IDA (1995 - 2001), the ISGS and ISWS have installed 191 monitoring wells in 57 counties across the state to monitor for pesticides in selected hydrogeologic settings. Between September 1998 and December 2000, 160 of the 191 wells were sampled as part of a one-time sampling effort. In addition, from October 1997 through July 2000, a set of six wells was sampled on a monthly basis with another four samplings between August and December 2000. Atrazine was the most commonly detected pesticide in the one-time sampling effort, being

found in 24 samples (mean concentration, 0.61 µg/L, median concentration 0.11 µg/L), and exceeding the Class I: Potable Resource Groundwater standard in only one sample. Atrazine was also the most commonly found pesticide in the more frequent 6-well subset sampling being found in 25 of 209 samples; however, the maximum concentration found was less than 1 µg/L (the Class I groundwater standard for atrazine is 3 µg/L). A draft final report was prepared by the ISGS and ISWS and is in review by the IDA.

ISGS and ISWS recently reported their findings on the sources of nitrate contamination in karst springs in southwestern Illinois (Panno et al., 2001). Other areas of effort can be observed in the attached list of publications, which are listed by year (2000 and 2001).

Illinois EPA and IDPH Groundwater Assessments

Under the 1996 amendments to the federal Safe Drinking Water Act (SDWA), the Illinois EPA is conducting a SWAP for community water supplies, and IDPH and county health departments are conducting these assessments for non-community public water supplies (NCPWS). Illinois EPA is also assisting with assessing the NCPWS. The purpose of SWAP is to:

- Identify areas that supply drinking water to the public;
- Inventory potential sources of contamination;
- Determine the susceptibility of the source water to contamination; and
- Inform the public of the assessment results.

More than 11 million people in Illinois rely on public water supplies for drinking water. Assessments are being conducted for all public water supplies in Illinois. This includes approximately 1,860 community water supplies and 3,639 non-community public water supplies. Illinois SWAP activities will be divided into the following areas: 1) community surface water supplies; 2) non-community surface water supplies; 3) Great Lakes (Lake Michigan); community groundwater supplies; 4) non-community groundwater supplies; and 5) mixed ground and surface water community supplies.

The SWAP should assist communities in making important decisions about how to protect their drinking water. By working to ensure safe drinking water supplies, the health and economy of the community, as well as the preservation of natural resources, will be greatly improved. In addition, investment in drinking water treatment will be sustained for a longer time period. Communities are currently taking an active role in assisting the Illinois EPA in the assessment of their drinking water sources.

As of October 1,2001, Illinois EPA has finalized source water assessment fact sheets for 150 CWS, and an additional 413 are being reviewed by communities. Furthermore, the Illinois EPA and IDPH have made considerable progress on the SWAP for NCPWS. IDPH has completed the field component of the assessment on 3,728 wells. Of these field investigations, 3,718 have undergone GIS registration and rectification by

The finalized source water assessments are available at: http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html.

Please note: Due to security concerns resulting from the events of September 11, 2001, the Illinois EPA has temporally removed this website from public availability.

Illinois EPA. GIS layouts have been completed on 2,828 wells and IDPH has begun finalizing assessment on approximately 1,547 wells. The IDPH has completed susceptibility determinations on 946 of these facilities.

Section 3. Continue to utilize innovative and cost effective methods to implement statewide groundwater quality monitoring.

The state of Illinois conducts many different water quality-monitoring programs to detect impairments to groundwater. Groundwater in Illinois is routinely monitored for biological and chemical contaminants. Groundwater quality monitoring programs consist of fixed station networks and intensive or facility related surveys of specific pumping centers.

Illinois EPA Groundwater Monitoring Programs

Ambient Network of CWS Wells – The Illinois EPA continues to operate an Ambient Network of CWS Wells consisting of 362 fixed locations. The CWS Network is designed to:

- Provide an overview of the groundwater conditions in the CWS Wells in Illinois;
- Provide an overview of the groundwater conditions in the major aquifers in Illinois;
- Establish baselines of water quality within the major aquifers in Illinois;
- Identify trends in groundwater quality in the major aquifers in Illinois; and
- Evaluate the long-term effectiveness of Clean, and Safe Drinking Water Acts program activities in protecting groundwater in Illinois.

In 2001, the Illinois EPA and the USGS initiated a project to sample for pesticide metabolites including:

- Deethylatrazine;
- Deisopropylatrazine;
- Cyanzine-amide;
- Acetochlor Ethanesulfunic acid (ESA);
- Acetochlor Oxanilic Acid (OXA);
- Alachlor ESA;
- Alachlor OXA;
- Dimethenamid ESA;
- Dimethenamid OXA;
- Flufenacet ESA;
- Flufenacet OXA;
- Metolachlor ESA; and
- Metolachlor OXA.

Pesticide Monitoring Subnetwork of the CWS Network - Since 1993, the Illinois EPA has operated a Pesticide Monitoring Subnetwork of the CWS Network. Initially, Illinois EPA tested all wells in the CWS Network for triazine and alachlor using immunoassay-screening methods. However, in the 1998 monitoring cycle, Illinois EPA discontinued the use of immunoassay and randomly selected 50 percent of the network wells. These wells are then analyzed for synthetic organic chemicals (SOCs) using standard laboratory test methods. In the year 2000 monitoring cycle, the remainder of the wells in the network was analyzed for SOCs. The Illinois EPA anticipates that this rotation will be maintained in the future.

Rotating Monitoring Network - The purpose of this monitoring network is to maximize resources and increase groundwater quality monitoring coverage at CWS wells. During the 1997 monitoring cycle, the Illinois EPA initiated a rotating monitoring network program. As a result of funding limitations, the Illinois EPA was forced to evaluate the CWS Network monitoring frequency. Illinois EPA determined that the primary purposes of the CWS Network referred to above could be realized by reducing the monitoring frequency of the network to a biennial basis.

The Illinois EPA is currently able to concentrate on specialized monitoring at high priority areas during alternate years. In 1997, monitoring was focused on concerns related to highly susceptible CWS wells. These wells were prioritized as a result of the detections of organic contaminants in treated water samples obtained during routine monitoring required by the SDWA. During the 1999 monitoring cycle, attention will focus on "new" CWS wells with little monitoring history. During the 2001 monitoring cycle the Illinois EPA, with the assistance of IDNS, is conducting a radon-monitoring program.

Radon Monitoring Subnetwork – The purpose of this monitoring network is to attempt to determine the statewide occurrence of radon in CWS wells. To accomplish this task the Groundwater Section of Illinois EPA is utilizing the CWS Network as a statistical base for the program. The CWS Network utilizes 17, three week sample periods. Within these sample periods, the Groundwater Section randomly selected 10 sampling stations. Following this selection, seven primary stations were selected. The remaining three stations were held as alternate stations that could be sampled if one of the primary stations could not be sampled.

On a weekly basis, the East Alton CWS is required to monitor water being discharged to Wood River Creek from their "old" water treatment plant. This plant has been retrofitted to treat the water being pumped from well #9 that contains elevated levels of iron/manganese (naturally occurring) and volatile organic compounds (primarily Methyl Tertiary Butyl Ether). In addition, the Illinois EPA conducts monthly monitoring of four active potable water supply wells, finished water, well #9, and the effluent.

To date (beginning in July 1999), approximately 305 volatile organic chemicals (VOC) samples have been collected and analyzed by the Agency at a projected analytical cost of $76,250. Furthermore, the Groundwater Section projects that one full time staff equivalent has been devoted to this project at an estimated cost of $80,000.

Special Intensive Monitoring Program at CWS Wells - As a result of monitoring conducted under the "new" wells sampling program, the Illinois EPA began providing technical assistance to the community of East Alton. To date, this has included groundwater flow modeling (with various pumping schemes), as well as more than 80 rounds of monitoring at the East Alton CWS. Many of these samples have been taken to comply with a court order requiring East Alton to use well #9 as a hydraulic containment well that captures a plume of contamination from two leaking underground storage tank (LUST) sites.

IDPH Monitoring Programs

Monitor the long-term effects of the 1993 flood on groundwater quality - From May of 1994 to September 1995, the IDPH conducted a study to evaluate private water wells and sewage systems that were affected by the flood of 1993. This study was conducted through a grant provided by the federal Centers for Disease Control (CDC) and Prevention. A total of 743 private wells were identified as flooded and were inspected during this study. Of this number, 299 wells were found to be abandoned and were not evaluated and 53 well owners refused to participate in the survey or to have their wells sampled. The remaining 391 wells were evaluated and sampled for coliform bacteria and nitrate. Of this number, 141 (36.1 percent) tested positive for coliform bacteria and 45 (11.5 percent) tested positive for Escherichia coli (E. coli.). (See Chapter X, Section 5, for a more detailed description of this study.)

IDA Monitoring Programs

Pesticide Monitoring Well Network - The IDA is developing a monitoring well network designed to monitor shallow groundwater for certain pesticides. The purpose of this network is to provide data to support implementation of the Illinois Generic Management Plan for Pesticides in Groundwater). To date, 191 monitoring wells have been installed as a part of this effort. The Department of Agriculture has initiated a monitoring program to sample all of the wells during a two-year period. All analyses are being conducted at the IDA's laboratory.

USGS Monitoring Programs

Lower Illinois River Basin National Water-Quality Study - As part of the National Water-Quality Assessment (NAWQA) Program the USGS is assessing both the Lower and Upper Illinois River Basin (LIRB and UIRB, respectively). The NAWQA studies are designed to be active for six to seven years, with subsequent minimal data collection for several years, followed by "full scale." This cycle is used for determining water quality trends. Copies of the "environmental setting" report of both the LIRB and UIRB are currently available.

Data collection is basically completed in the LIRB and presently (2001) the study is in the low-intensity phase (limited data collection and analysis). A summary report describing the results of the high-intensity phase (intensive data collection and analysis) is available (U.S. Geological Survey Circular 1209). Other reports concerning ground water and surface-water quality in the LIRB are available from the USGS. The USGS and Illinois EPA collected untreated groundwater samples from CWS wells from 1984 to 1991. The USGS will utilize this data to conduct statistical analysis of the groundwater chemistry in the LIRB for the purpose of determining the status of, and trends in, groundwater quality of this area.

The USGS is currently collecting and analyzing data (high-intensity phase) in the UIRB. A pilot study of the UIRB was conducted in the 1980s, but it dealt exclusively with surface water quality. However, the present study of the UIRB includes both surface and groundwater quality.

Special Studies

Northeastern Illinois Chloride Study – The ISWS recently conducted a study of groundwater monitoring data collected by the Illinois EPA in the northeastern portion of the state. Based upon the preliminary assessment of this information, there is an apparent trend of increasing chloride concentrations in the study area. This information is summarized in Figures 4 and 5. The groundwater standard for chlorides, except due to natural causes, is 200 parts per million (ppm).

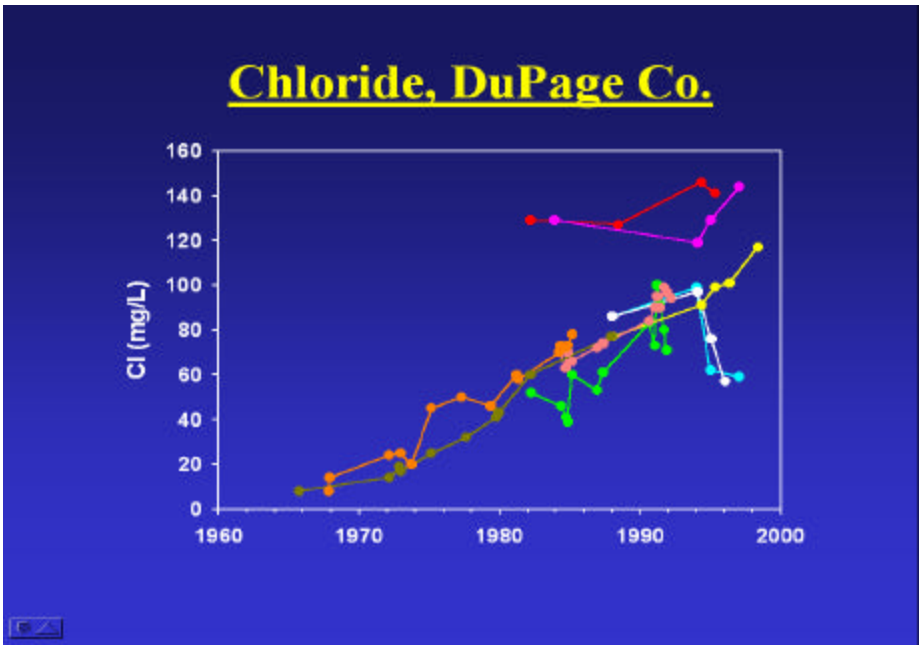


Figure 4. Chlorides in DuPage County Groundwater (W. Kelly, ISWS)

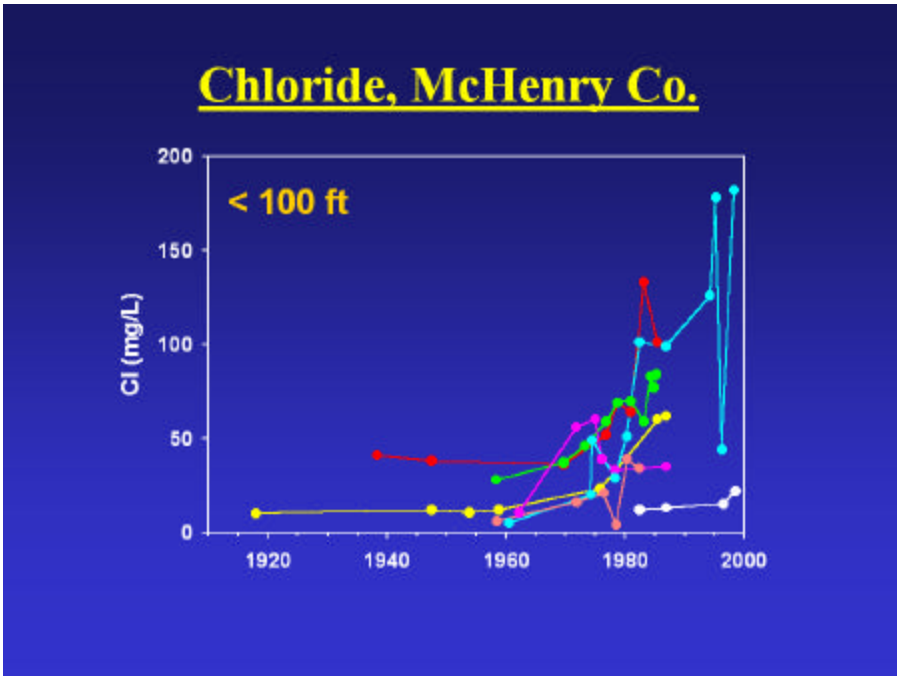


Figure 5. Chlorides in McHenry County (W. Kelly, ISWS)

SDWA Monitoring Correlations - Community water supplies in Illinois routinely sample for volatile organic chemicals (VOC) as a result of SDWA monitoring requirements. Under Illinois' CWS Laboratory Fee Program, analyses for MTBE have been reported as a part of standard laboratory methods since 1994. Therefore, the Illinois EPA has received SDWA compliance samples that are taken at the entry point to a CWS distribution system. These are also referred to as "finished water samples". Since 1994, 26 community water supplies have been impacted by MTBE contamination. Another factor to consider is that these are finished water samples, collected after treatment. Thus, the contamination level in the source water could be higher. In addition, there is the potential risk to other potable wells, including private, semi-private and non-community water supply (NCWS) wells.

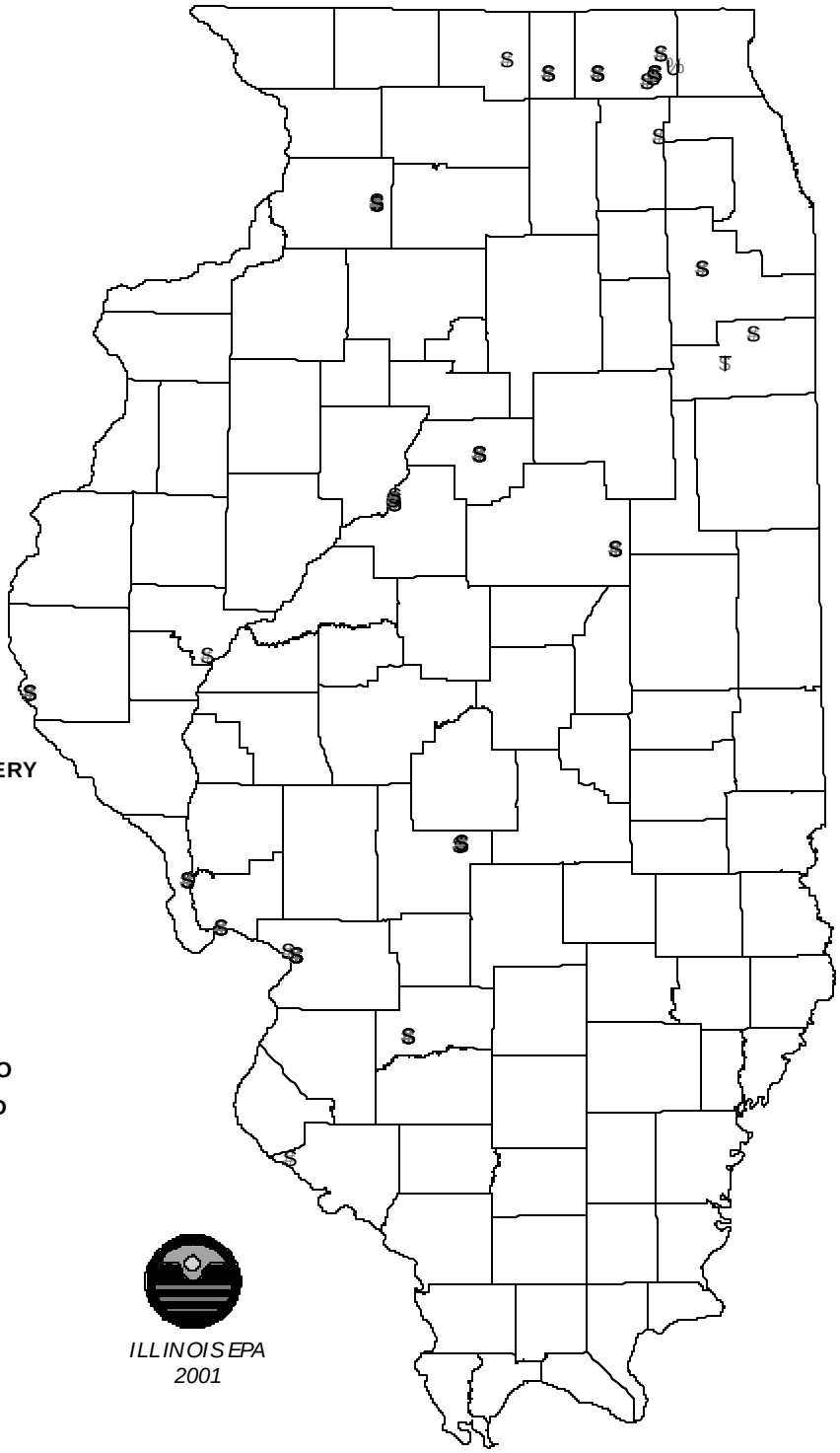
The monitoring conducted at over 1,200 CWS participating in the program (just over 1,100 of these facilities are groundwater dependent) has resulted in 26 facilities with detections of MTBE. The Illinois EPA has evaluated each of the 26 community water supplies with MTBE detects as shown in Figure 6. Four CWS have had to discontinue use of wells as a result of MTBE contamination:

- Oakdale Acres Subdivision (and two other small subdivisions served by private wells), located in Kankakee County, had to discontinue use of their wells and connect to a nearby CWS;
- Roanoke, located in Woodford County, has had to shut a well due to concentrations exceeding the taste and odor threshold of 20 parts per billion (ppb) of MTBE;
- East Alton, located in Madison County, has had to use one of their wells as a hydraulic containment well with treatment and discharge to surface water to protect their well-field from a MTBE plume with a concentration exceeding 1,000 ppb; and
- The community of Island Lake had to take a well out of service as a result of elevated levels of MTBE. Figure 5 displays CWSs with MTBE detections. In addition, Figure 6 displays a table of projected treatment costs for the East Alton CWS. This data does not include the cleanup costs for remediation of nearby potential sources of contamination.

In addition, the SDWA monitoring has detected naturally occurring contaminants, such as arsenic and radionuclides. These contaminants require treatment in certain parts of the state and are expected to drive CWS SDWA compliance activities and assistance programs such as the Public Water Supplies Revolving Loan Fund. Figures 7 and 8 geographically show anticipated areas of concern within Illinois.

COMMUNITY WATER SUPPLIES WITH MTBE DETECTIONS

CWS NAME	County
T&C MOBILE ESTATES	ADAMS
BELVIDERE	BOONE
HARDIN	CALHOUN
GERMANTOWN	CLINTON
GRAFTON	JERSEY
SOUTH ELGIN	KANE
MANTENO	KANKAKEE
OAKDALE ACRES SBDV.	KANKAKEE
BETHALTO	MADISON
EAST ALTON	MADISON
MCHENRY	MCHENRY
MARENGO	MCHENRY
ISLAND LAKE	MCHENRY
CRYSTAL LAKE	MCHENRY
CRYSTAL HEIGHTS	MCHENRY
SAYBROOK	MCLEAN
NOKOMIS	MONTGOMERY
PRAIRIE DU ROCHER	RANDOLPH
RUSHVILLE	SCHUYLER
CREVE COEUR	TAZEWELL
NORTH PEKIN	TAZEWELL
MARQUETTE HEIGHTS	TAZEWELL
ROCK FALLS	WHITESIDE
CLEARVIEW SBDV	WILL
LOVES PARK	WINNEBAGO
ROANOKE	WOODFORD



CWS Wells with MTBE Detections

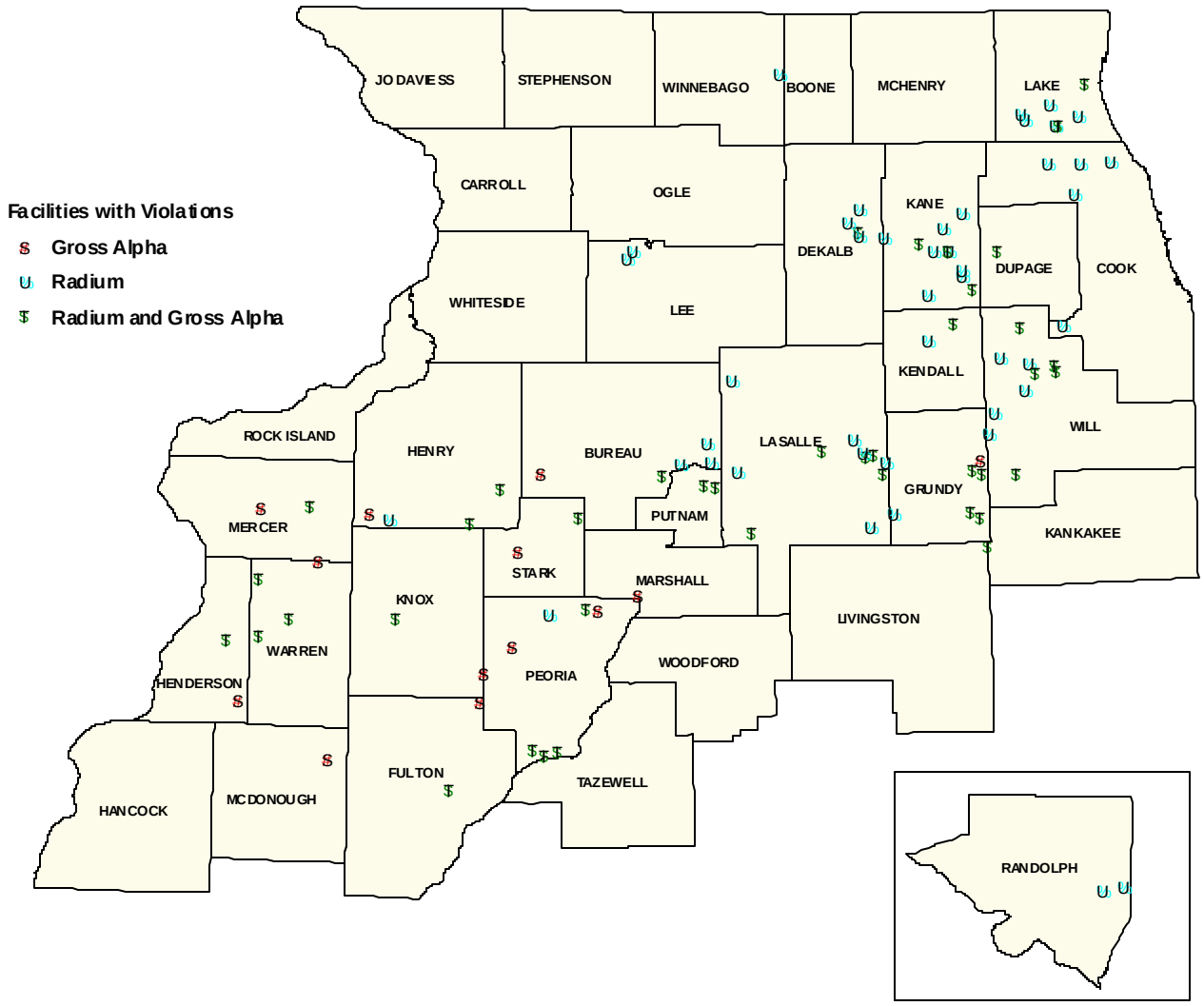
Closed Facility With MTBE Detections

Active CWS Facility With Decommisioned Wells Due To MTBE

ILLINOIS EPA
2001

Figure 6. MTBE Concentrations in Community Water Supplies (Konczyk, Illinois EPA)

RADIONUCLIDE MCL VIOLATIONS FOR COMMUNITY WATER SUPPLIES IN ILLINOIS



PUBLIC WATER SUPPLY NAME	COUNTY NAME
BUREAU JUNCTION	BUREAU
DE PUE	BUREAU
LADD	BUREAU
NEPONSET	BUREAU
SPRING VALLEY	BUREAU
SUNSET MHP	COOK
FRANCISCAN SISTERS OF CHICAGO	COOK
ARLINGTON PARK RACE TRACK	COOK
PROSPECT HEIGHTS	COOK
DES PLAINES MHP	COOK
CORTLAND	DEKALB
DE KALB	DEKALB
SYCAMORE	DEKALB
CORTLAND CORNERS MHP	DEKALB
WEST CHICAGO	DUPAGE
BRYANT	FULTON
FARMINGTON	FULTON
PRAIRIE OAKS ESTATES	GRUNDY
CARBON HILL	GRUNDY
DIAMOND	GRUNDY
GARDNER	GRUNDY
KINSMAN	GRUNDY
SOUTH WILMINGTON	GRUNDY
BIGGSVILLE	HENDERSON
RARITAN	HENDERSON
ALPHA	HENRY
GALVA	HENRY
KEWANEE	HENRY
WOODHULL	HENRY
SILVER GLEN ESTATES	KANE
WASCO SANITARY DISTRICT	KANE
MILL CREEK RECLMTN DISTRICT	KANE
ELBURN	KANE

PUBLIC WATER SUPPLY NAME	COUNTY NAME
MAPLE PARK	KANE
NORTH AURORA	KANE
SUGAR GROVE	KANE
BATAVIA	KANE
BREAZEALE MHP	KANE
BROADVIEW ACDMY	KANE
MOOSEHEART	KANE
REDDICK	KANKAKEE
OSWEGO	KENDALL
YORKVILLE	KENDALL
KNOXVILLE	KNOX
YATES CITY	KNOX
WYNSTONE WTR CMPNY	LAKE
ROYAL MELBOURNE HMOWNRS ASSOCI	LAKE
WHISPERING LAKES	LAKE
LAKE ZURICH	LAKE
BRIARCREST SBDV HOMOWNERS ASSN	LAKE
ELM OAK MUTUAL WTR SYST	LAKE
WEST SHORE PARK SBDV	LAKE
WOODSMOKE RANCH ASSN WELL 2	LASALLE
WHISPERING PINES MHP	LASALLE
LOSTANT	LASALLE
MENDOTA	LASALLE
OTTAWA	LASALLE
RANSOM	LASALLE
HMOWNRS ASSN OF FOUR LKS SBDV	LASALLE
IL PRAIRIE EST SBDV	LASALLE
LYNNWOOD WATER CORP	LASALLE
COUNTRY ACRES MHP	LASALLE
WILDLIFE MHP	LASALLE
DIXON	LEE
DIXON CORRECTIONAL CENTER	LEE
BUSHNELL	MCDONOUGH

PUBLIC WATER SUPPLY NAME	COUNTY NAME
HOPEWELL	MARSHALL
ALEDO	MERCER
VIOLA	MERCER
BRIMFIELD	PEORIA
GLASFORD	PEORIA
KINGSTON MINES	PEORIA
MAPLETON	PEORIA
PRINCEVILLE	PEORIA
EDELSTEIN WTR COOP	PEORIA
SANTA FE ESTATES WATER ASSN	PEORIA
GRANVILLE	PUTNAM
STANDARD	PUTNAM
PERCY	RANDOLPH
STEELEVILLE	RANDOLPH
BRADFORD	STARK
TOULON	STARK
KIRKWOOD	WARREN
LITTLE YORK	WARREN
MONMOUTH	WARREN
ALEXIS	WARREN
CHANNAHON WEST	WILL
CHANNAHON	WILL
JOLIET	WILL
LOCKPORT	WILL
PLAINFIELD	WILL
ROCKDALE	WILL
ROMEOVILLE	WILL
LAKEWOOD SHORES IMPRV ASSN	WILL
STATEVILLE CRCTL CTR	WILL
JOLIET CRCTL CTR	WILL
LOVES PARK	WINNEBAGO

Figure 7. Radionuclides Violations in Community Water Supplies (J. Konczyk, Illinois EPA)

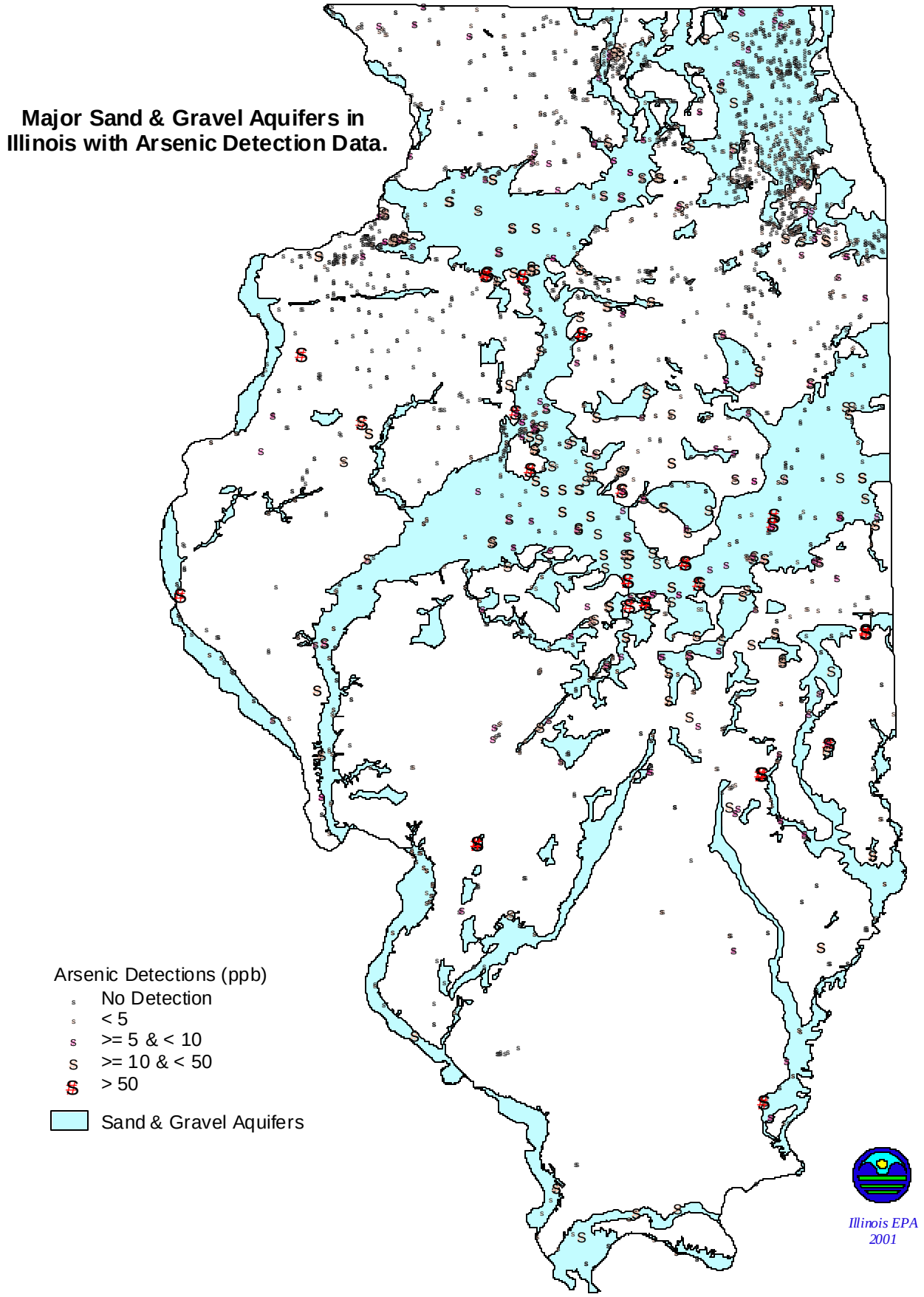


Figure 8. Arsenic Concentrations in Community Water Supply Wells (J. Konczyk, Illinois EPA)

Section 4. Continue to implement and improve overall groundwater quality indicators

Water Quality Trends

Figure 1 of the Executive Summary illustrates the water quality data obtained from the Ambient Network of CWS wells in the four principal aquifers in Illinois. The bar graphs of this figure depict the trends in water quality from network wells by aquifer grouping. Overall groundwater contamination trends for nitrate, VOC and SOC contaminants appear to be favorable in sand and gravel, mixed (wells producing source water from multiple aquifer groups) and deep bedrock aquifer wells. There appears to be a slight increase in contaminant levels in wells producing source water from shallow bedrock aquifers.

As related in previous IGPA Biennial Reports, the statewide detection rate for inorganic chemicals (IOCs) in the CWS Network wells compares favorably with the one-time, statewide monitoring program for all CWS wells conducted from 1985 through 1988. The statewide detection rate for VOCs in CWS wells does not appear to have increased since 1988. Further, monitoring data on SOCs versus immunoassay testing conducted in the CWS Network indicates that certain degradation products may be present in Illinois groundwater. This may account for low-level immunoassay detections for triazine and alachlor compounds with no confirmation by traditional synthetic organic compound extraction methods. The Illinois EPA and USGS are initiating a pilot-monitoring program to investigate this issue.

Pursuant to Section 13.1(b) of the Illinois Environmental Protection Act (Act), the Illinois EPA is in the process of assessing the current levels of contamination (anthropogenic and naturally occurring) in the groundwaters of the state. The following table and graphs contained in Figure 9 reflect an initial review of percentiles of selected inorganic chemical constituents found in the Ambient Network of CWS Wells[1]

The data were analyzed using the MDL.MAC macro (written by Dennis Helsel of the USGS) for the statistical program Minitab©. This macro computes summary statistics for data that include observations known to be below one or more detection limits. The method uses a probability plot of the logarithms of the data, as discussed by Helsel and Cohen (1988)[2]. The 25th, 50th (median) and 75th percentiles were estimated from the lognormal maximum likelihood estimate technique (Helsel and Hirsh, 1992)[3]. The data above the reporting limit were fit to a lognormal distribution, which was used to extrapolate the data below the reporting limit. If the extrapolated values were one or more magnitudes below the reporting limit, or if 80 percent of the data were below the reporting limit, a less than reporting limit is given in percentiles.

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[1] A more detailed discussion of the CWS Network Monitoring procedures, locations, stratification, principal aquifer locations, and statistical analyses may be obtained by referencing the Illinois Water Quality Report (Clean Water Act, Section 305(b) Report).

[2] Helsel and Cohen (1988), Water Resources Research v. 24, p. 1997-2004

[3] Helsel, D.R., and Hirsh, R.M., 1992, Statistical Methods in Water Resources: New York, Studies in Environmental Science 49, Elsevier Science Publishers, 522 p.

Inorganic concentrations for the 1998-99 Ambient Network of CWS Wells								
Inorganic Constituent	Reporting Units	GWQS	N	narl	Percentile 25	Median	75	Maximum
Arsenic	UG/L	50	350	113	0.19	0.72	2.3	70
Barium	UG/L	2000	350	338	40	77	162.5	18000
Boron	UG/L	2000	350	326	31	150	392.5	2100
Chloride	MG/L	200	343	295	4.04	18.8	48.6	1036
Chromium	UG/L	100	349	5	< 0.5	< 0.5	< 0.5	8
Copper	UG/L	650	349	96	< 10	2.1	11	3300
Fluoride	MG/L	4	345	341	0.18	0.34	0.55	6.63
Iron	UG/L	5000	349	281	104	520	1550	33000
Lead	UG/L	7.5	350	37	< 5.0	< 5.0	< 5.0	3360
Manganese	UG/L	150	349	185	4.89	18	60.5	1700
Mercury	UG/L	2	348	3	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	UG/L	100	349	12	< 25	< 25	< 25	240
Nitrate	MG/L	10	348	161	< 0.01	0.01	0.10	12.6
Sulfate	MG/L	400	345	272	13.19	44.4	103	965
Zinc	UG/L	5000	349	16	< 25	< 25	< 25	5100

Reporting Units, MG/L (Milligrams per Liter), UG/L (Micrograms per Liter); GWQS, Groundwater Quality Standard; N, Number of observations; narl, number of observations above reporting limit; percentiles and maximums are recorded in reporting units.

None of the 15 constituents analyzed had any percentile that exceeded the Groundwater Quality Standard (GWQS). In addition, both mercury and chromium had maximum values that did not exceed the GWQS. Finally, seven of the 15 constituents had all three percentiles below the maximum reporting limits, as denoted by the dotted box under the detection level. For a more detailed analysis of the IOCs, see the 2002 Illinois Water Quality Report (Clean Water Act, Section 305(b) Report).

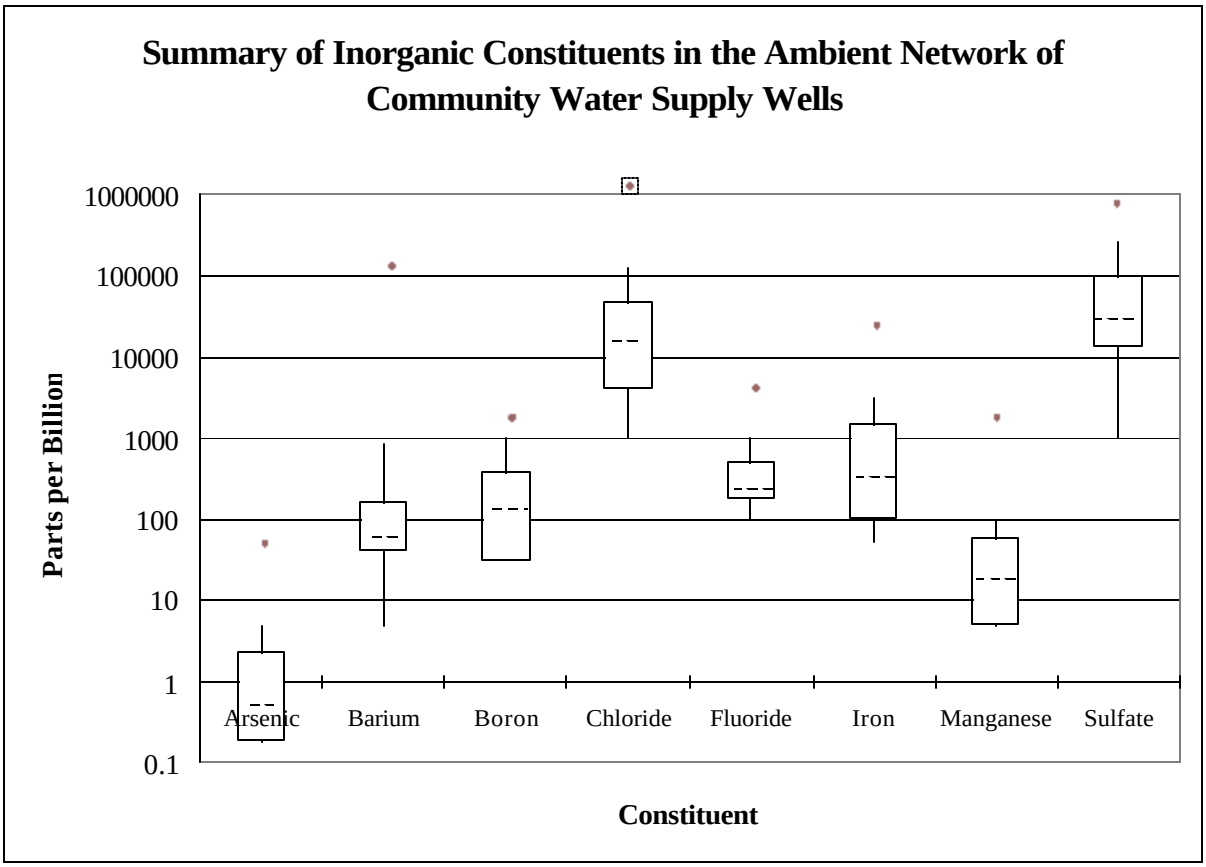
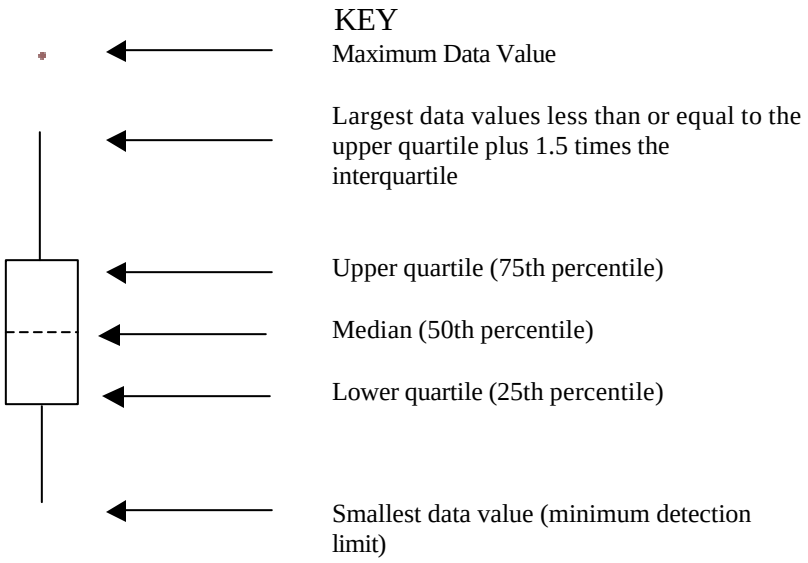


Figure 9. Graphic Portrayal of Selected Inorganic Constituents for CWS Network Wells



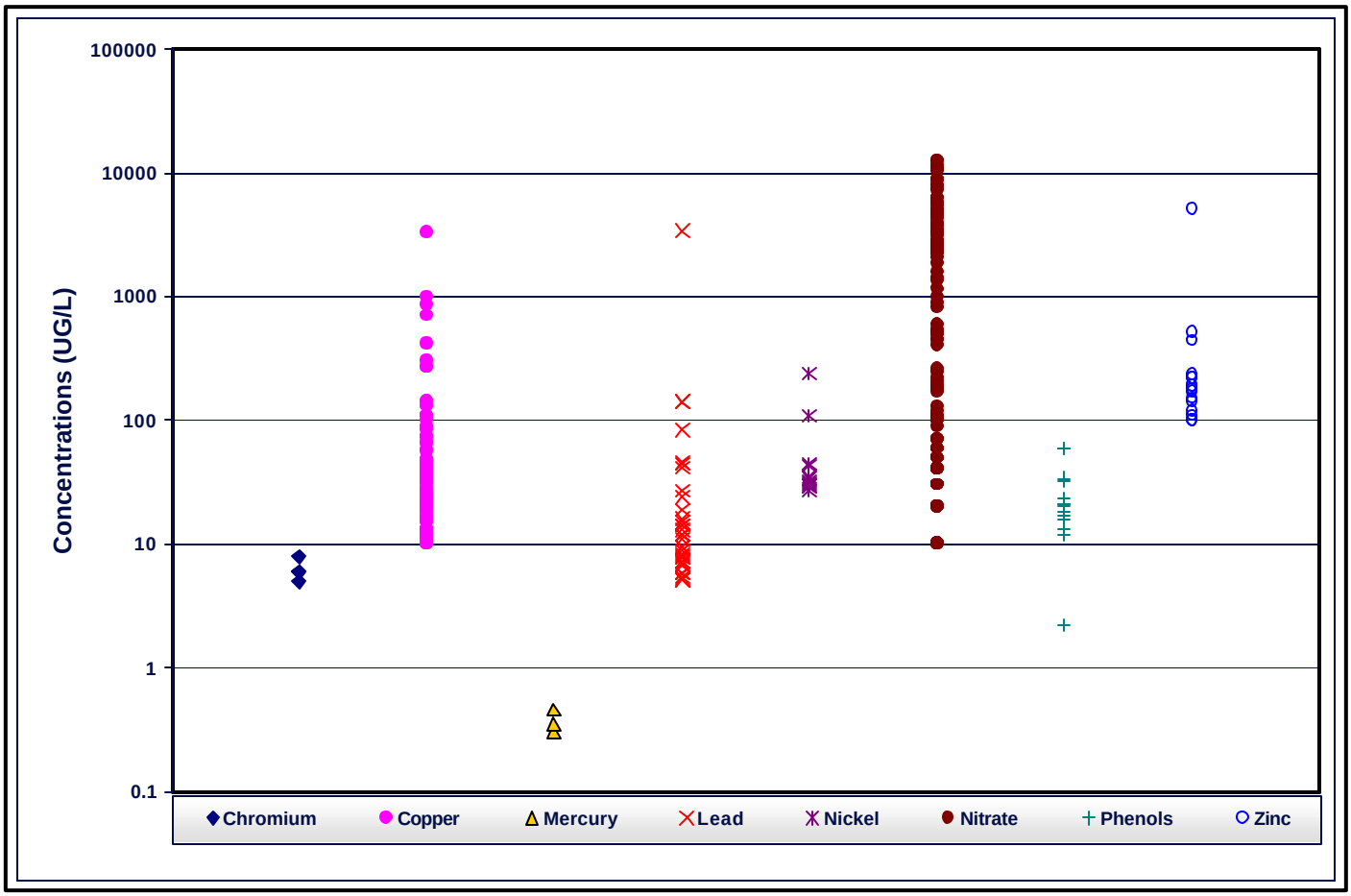


Figure 9 Graphic Portrayal of Selected Inorganic Constituents for CWS Network Wells Continued

All concentrations are plotted in Micrograms per Liter (UG/L) and only recorded if over the detection limit. The minimum detection limits for the above constituents are as follows:

- Chromium 5.0 UG/L
- Copper 10.0 UG/L
- Mercury 0.10 UG/L
- Lead 5.0 UG/L
- Nickel 25.0 UG/L
- Nitrate (N) 10.0 UG/L
- Phenols 10.0 UG/L
- Zinc 100. UG/L

CHAPTER V. GROUNDWATER QUALITY STANDARDS AND TECHNOLOGY CONTROL REGULATIONS

Section 1. Evaluate the need to develop Class III: Special Resource Groundwater Standards

Class III Special Resource Groundwater is groundwater that may take on an ecologically vital role, such as supporting a fen, marsh, wetland or cave. One area in Illinois has been designated as Class III groundwater since this definition for Class III groundwater has been made. The NPC is working with the ISWS to delineate the area contributing groundwater to 84 dedicated nature preserves. Since these waters are ecologically vital to the area they are found in, more stringent standards may be developed to classify and subsequently protect areas that are deemed Class III.

Section 2. Evaluate dedicated nature preserves for Class III designation

In 1998, 279 nature preserves were identified in Illinois. These were reviewed to see if they meet the criteria set forth to be considered Class III groundwater. Several studies were conducted on these preserves to determine groundwater sensitivity/vulnerability. Using a groundwater sensitivity map of Illinois, it was determined that approximately 100 of these preserves have high or very high sensitivity to groundwater contamination. Another study using field assessments on a subset of 85 preserves found that 26 preserves have high or very high vulnerability for groundwater contamination. From these studies, it can be determined that 30 to 40 percent of nature preserves would be good candidates for Class III designation at this time.

In order to protect groundwaters that are particularly sensitive and ecologically vital, the ISWS has continued its efforts to delineate the area(s) contributing groundwater to 84 dedicated nature preserves. This effort is intended to provide the basis for designating these areas as Class III: Special Resource Groundwater. Currently, the ISWS has indicated that 11 areas are ready for Illinois EPA review for technical adequacy, and subsequent posting in the Illinois Environmental Register.

Section 3. Continue to implement and integrate the groundwater quality standards into environmental programs

The Illinois EPA BOW and Bureau of Land (BOL) have coordinated on the development of a groundwater standard and cleanup objective for MTBE. The Illinois EPA Office of Chemical Safety (OCS) has developed a health-based number for MTBE that is proposed as a Class I groundwater standard and as a Tier 1 cleanup objective. An aesthetic value (taste and odor threshold) is proposed for the preventive response level in the groundwater standards regulations.

Section 4. Continue to update and amend the groundwater standards to parallel the drinking water standards adopted by U.S. EPA

The Illinois EPA has proposed a groundwater quality standard for MTBE, a common gasoline octane enhancer. Though the U.S. EPA has not yet adopted a maximum contaminant level (MCL) for MTBE, its occurrence in approximately 26 Illinois groundwater based community

water supplies since 1994 raises concerns. Thus, the standard proposed was based on a health advisory developed by Illinois EPA according to Illinois Pollution Control Board (Board) procedures.

COST COMPARISON SUMMARY (a) Assume Illinois EPA loan, 20 years, 3%, Level debt (no coverage) (b) Increase over and above current annual cost of $590,000, excluding depreciation						
Case	Description	Capital Cost	Debt Service (a)	O&M Cost Increase	Annual Cost Increase	% Revenue Increase (b)
1a	Pump, Treat, Discharge (Iron & Manganese Reduction)	$41,700	$2,803	$89,900	$92,603	15.7%
1b	Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with Air Stripper)	$658,300	$44,254	$156,900	$201,154	34.1%
1c	Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with GAC)	$1,048,600	$70,492	$738,200	$808,692	137.1%
2	Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with Air Strippers & GAC)	$2,904,500	$195,255	$1,561,000	$1,756,255	297.7%
3	New Well Field	$2,727,100	$183,329	$51,400	$234,729	39.8%
4	Alternate Treated Water Supply	$1,505,000	$101,174	$568,900	$670,074	113.6%

Section 5. Continue to implement preventive notice and response programs and integrate with environmental programs

As part of a "new well program," the Illinois EPA will conduct groundwater monitoring and potential source identification as each new community well becomes active. The monitoring will serve to establish a baseline of water quality data for the well, but will also provide data that may initiate the preventive notice and preventive response activities of 35 IAC 620.305. The concurrent potential source identification will fulfill the requirement that a well site survey be completed within five years of initiation of the preventive notice and preventive response activities. There is currently a backlog of "new" community wells that have not undergone previous raw water monitoring. This population of community wells, coupled with the newly permitted community wells that are coming on line, will provide a basis for water quality assessment in alternate years when the Ambient Network of CWS Wells is not being sampled.

Section 6. Continue to implement the technology control regulations and improve a database for tracking and evaluating compliance data

The Office of the State Fire Marshal (OSFM) has continued to send the Illinois EPA a copy of all underground fuel storage tank permits on which a potable well is indicated to be within 400 feet. This interaction has improved the effectiveness of the setback prohibitions. Those sites not within a minimum setback zone can proceed with construction. Even the sites at which a waiver or exception must be sought have the benefit of a contact point within the Illinois EPA. For these sites, the waiver or exception process begins sooner, thus minimizing construction delays, thereby promoting legal construction, and minimizing violations in the future.

The increased contact between fuel tank and equipment installation companies and the Illinois EPA also provides the opportunity to educate the regulated community as to the proper procedures to follow when seeking waivers and exceptions. Having dealt with the situation previously, a number of companies have contacted the Illinois EPA in advance of the OSFM notice to begin the waiver process.

During the past two years, the Illinois EPA has assembled a scope of work (SOW) for a revised and up-graded version of the H2OWORKS database. H2OWORKS is designed to store location data, regulatory tracking information and associated information about sites and wells. The current version of H2OWORKS is constructed in FoxPro 2.6. The new data tables will be reconstructed in Oracle. This will allow the database to be truly relational, and more easily linked with tables with other data systems such as Safe Drinking Water Information System (SDWIS). Data input screens, forms and reports will be created in Access, so that they can be easily modified, as program needs change. As part of a cooperative agreement between the Illinois EPA and the USGS, the contract to perform the programming work called for by the SOW is being managed by the USGS.

Section 7. Evaluation of activities located proximate to CWS where local groundwater protection management efforts are completed or in progress will be given priority

Two hundred seventy three wells, representing 89 community water systems that have adopted maximum setback zones, have been given priority for review to find sites that may be subject to the technology control regulations (35 IAC 615/616). The sites selected for this round of assessment were only the ones that store fertilizer, pesticides, deicing agents or road oil. These types of sites were selected because the materials stored make them subject to regulation. Many sites that may generate waste will require significant additional interaction with the facility to determine if a regulated waste is generated, and if storage and disposal practices of that waste meet the criteria for regulation by the technology control regulations. The sites evaluated were further prioritized from the larger group by selecting those facilities utilizing unconfined wells. Because unconfined wells are more vulnerable to releases that may occur, they were given first priority. One additional site that did not have a maximum setback zone was evaluated, because Illinois EPA records indicated that the well was immediately adjacent to the site. Seven sites were evaluated. Four of the sites were found not to be regulated under 35 AIC 615/616, two sites need further evaluation and one site is currently working with the Illinois EPA to develop and implement their groundwater monitoring program.

The project to rebuild and enhance the H2OWORKS data system will also include a data storage table designed specifically to record regulated site, groundwater-monitoring data. The table's design will be based on the prototype water quality database currently being used and tested with CWS groundwater monitoring data.

Section 8. Evaluation and compliance determination for activities referred by permit programs will also be given priority

The Groundwater Section is working cooperatively with the Drinking Water Compliance Assurance Section (CAS) to ensure that BOW permitted sites with groundwater quality violations are effectively remediated. The Groundwater Section continues to assess a means of screening groundwater quality data from BOW permitted sites to identify potential problem areas.

Section 9. Continue cooperation between the Illinois EPA and the IDPH to provide statewide education seminars on the implementation of the technology control and groundwater standards regulations

The Illinois EPA and the IDPH are the primary state agencies responsible for implementing this groundwater protection goal. Coordination between Illinois EPA and IDPH has been good and there has been success with implementing this activity.

Through the SDWA, the IDPH inspects non-community public water systems. Monitoring for pesticides, IOCs, PCBs and VOCs took effect in 1993 for 535 non-transient non-community water systems. Monitoring for lead and copper occurred in 1994. By the end of 1996, approximately 75 percent of these water systems were sampled for the above parameters. In 1999, an additional 3 percent of non-transient wells were identified and not sampled as of yet. This brings the total sampling percentages to 94 percent for lead and copper, 95 percent for SOCs, 94 percent for IOCs, and 95 percent for VOCs.

The Well Site Survey Reports and other regulatory initiatives under the IGPA provide a valuable avenue for implementation and prioritization of the technology control and groundwater regulations for community wells. Through the permitting and inspection of new private, semi-private, non-community, and non-potable water wells and through its educational program, IDPH has provided technology control and groundwater regulations. The IDPH and the Illinois Association of Groundwater Professionals co-sponsored eight water well construction and groundwater protection seminars throughout the state during 2000 and 2001 for licensed water well contractors and other stakeholders.

The Illinois EPA contacts the IDPH whenever the contamination or siting of a private or non-community well is a concern with regard to these regulations. Through six regional offices and 83 local health departments, IDPH will continue to utilize efficient methods to implement statewide groundwater quality monitoring.

The IDPH has conducted inspections at over 3,100 Public NCWS wells. As part of this process, 9,949 activities have been identified proximate to wellhead protection areas at these facilities. These activities have been entered into a database and will be evaluated in the future for compliance with the technology control regulations.

CHAPTER VI. GROUNDWATER QUANTITY ISSUES

Governor George H. Ryan called on the Board to conduct a series of public hearings to solicit information and public input regarding the environmental effects of gas-fired, peak-load electrical generation facilities, also known as peaker plants. "Many Illinois residents have come to me and voiced concerns about the effects of these facilities on the environment," Ryan said. "Through these public hearings, everyone - including local residents - will get the opportunity to offer their input and become part of the solution."

The Board conducted seven days of public hearings at five locations: August 23 and 24, 2000, in Chicago; September 7, 2000, in Naperville; September 14, 2000, in Joliet; September 21, 2000, in Grayslake; and October 5 and 6, 2000, in Springfield. All seven Board members attended each day of hearing. Over 80 persons testified, including individual citizens, representatives of citizen groups, representatives of state and local government, and representatives of industry. The Board summarized the results of these hearings with respect to water, as follows:

- The record of these proceedings does not suggest that discharges from peaker plants pose a unique threat, or a greater threat than other state-regulated facilities, regarding water pollution. Nor does the record reveal any gap in existing water pollution regulations with respect to wastewater discharges to surface waters or publicly owned treatment works, or storm water discharges. The Board therefore makes no recommendation for additional regulations to address potential water pollution from peaker plants. The Board emphasizes, however, that peaker plants do raise concerns about water use;

- The Board also noted that Governor Ryan created the Water Resource Advisory Committee (WRAC) to assess the use of groundwater and surface water. The WRAC's work includes assessing the impacts that users, including peaker plants, have on these supplies of water and recommending action. The WRAC should address the virtual absence of state controls or plans regarding water use. To assist the WRAC in its work, Chairman Manning, who sits on the WRAC on behalf of the Board, forwarded a letter to the WRAC, attaching summaries of information on water use from these inquiry-hearing proceedings and on the regulatory frameworks that other midwestern states have with respect to water use. In her letter, Chairman Manning calls on the WRAC to focus its attention on "the development of a workable regulatory framework for the conservation and fair allocation of water resources in this great State: one that meets the needs of all concerned citizens and entities."; and

- Accordingly, concerns over environmental impacts from air emissions, noise emissions, and water use can be addressed through state or regional regulatory mechanisms outside of a siting process.

Governor George Ryan announced the establishment of a WRAC to look at the issues surrounding water management in the state of Illinois on June 6, 2000. The WRAC was co-chaired by Brent Manning, director of the Illinois DNR and Tom Skinner, then director of the Illinois EPA. The Governor invited twenty-five individuals representing a broad cross section of water users and water suppliers to serve on the WRAC. Between August 31, 2000, and January 9, 2001, the WRAC held five meetings.

Meetings included presentations from various DNR and Illinois EPA staff on a broad range of water issues, followed by discussions among WRAC members. The committee worked toward a consensus building process through the identification of numerous issues and concerns regarding the future direction of water resources management and regulation in Illinois. Through the review of the committee's deliberations, an interagency drafting committee prepared legislative language for comprehensive water management entitled "Water Quantity Stewardship Act." This draft legislation was submitted to the WRAC for review and comment.

A case study in the six county area around Chicago has shown that the deep bedrock aquifer is at a level of sustained yield at 65 MGD, and withdrawals beyond this will mine the groundwater, as shown in Figure 10. Currently, under the Lake Michigan Allocation Act, the majority of these counties are using Lake Michigan. However, the Lake Michigan allocation is at its limit. A significant future concern is that the population is projected to increase 70 -100 percent by the year 2020, and this will put an increased reliance back on shallow groundwater resources. The ISWS and Harza Engineering have projected water surpluses and shortages for northeastern Illinois for the year 2020.

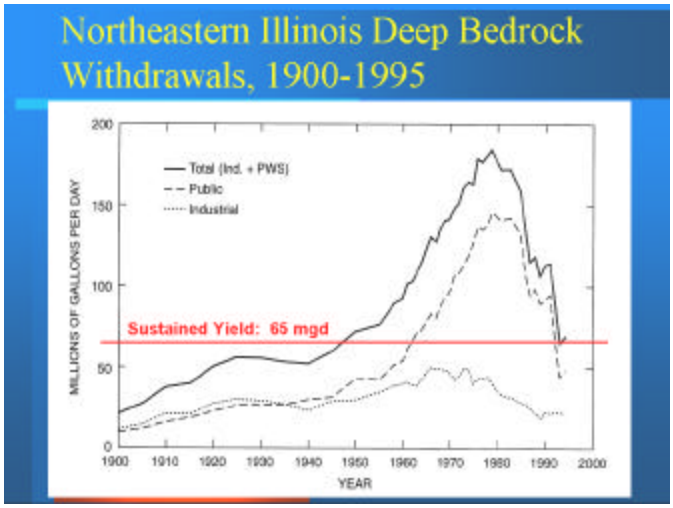
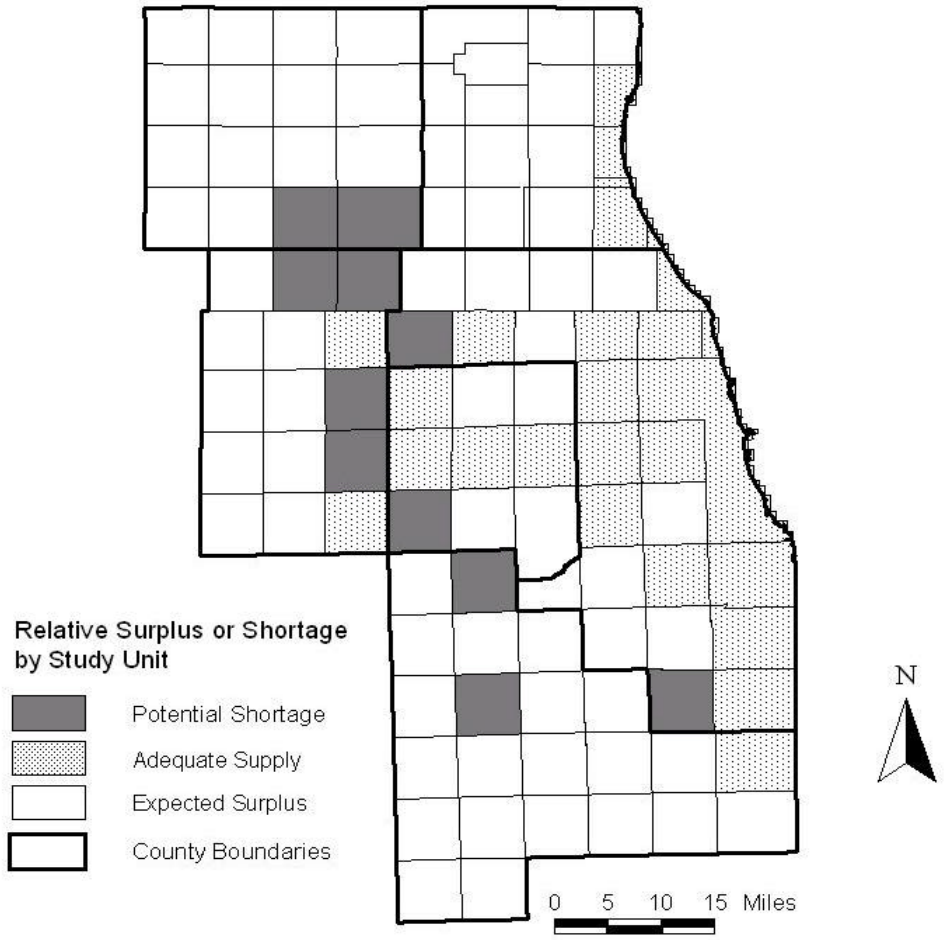


Figure 10. Deep Bedrock Withdrawals N.E. Illinois (From D. Winstanly ISWS)

Figure 11, developed as part of the Northeastern Illinois Planning Commission's (NIPC) Strategic Plan for Water Resource Management, shows the areas projected to experience water surpluses or shortages. Figure 12 developed by the ISWS shows the projected population growth versus water use. Further, Figure 13 illustrates a projection of water supply versus demand. This may also exacerbate urban sprawl.



Estimates derived using 1998 Census Bureau population estimates, NIPC's 2020 population forecasts (Sept. 2000), groundwater supply availability estimates by IDNR/SWS (shallow aquifer groundwater availability based on Singh and Adams [1980], deep bedrock aquifer groundwater availability based on Suter et al. [1959]), Lake Michigan and other surface water supply availability estimates by Harza Engineering (2001), and per capita water demand estimates by Harza Engineering (2001).

Figure 11. Relative Estimate of 2020 Water Surplus or Shortage by Study Unit (Township)

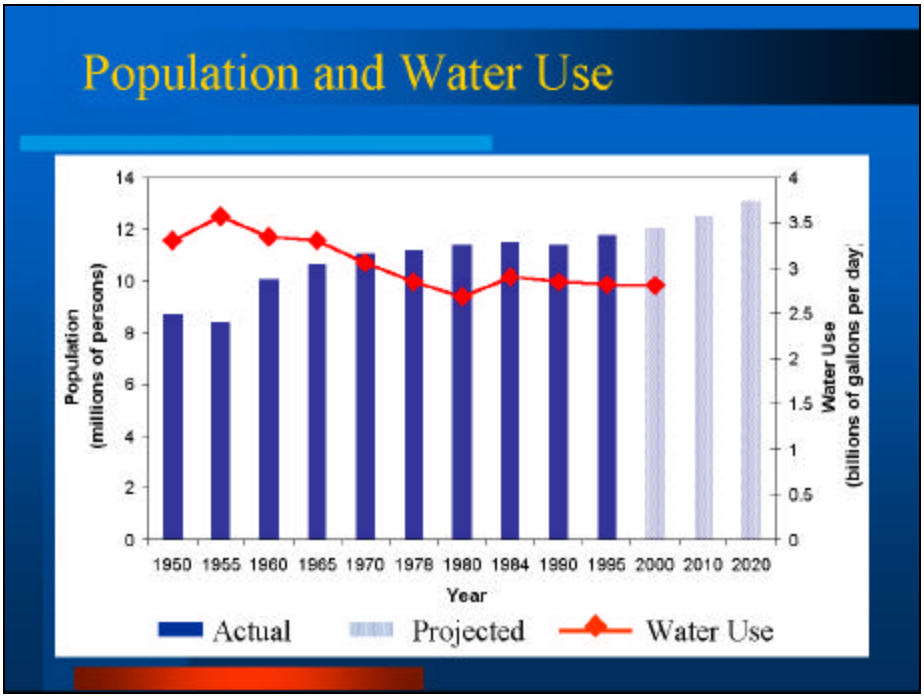


Figure 12. Population and Water Use (D. Winstanley, ISWS)

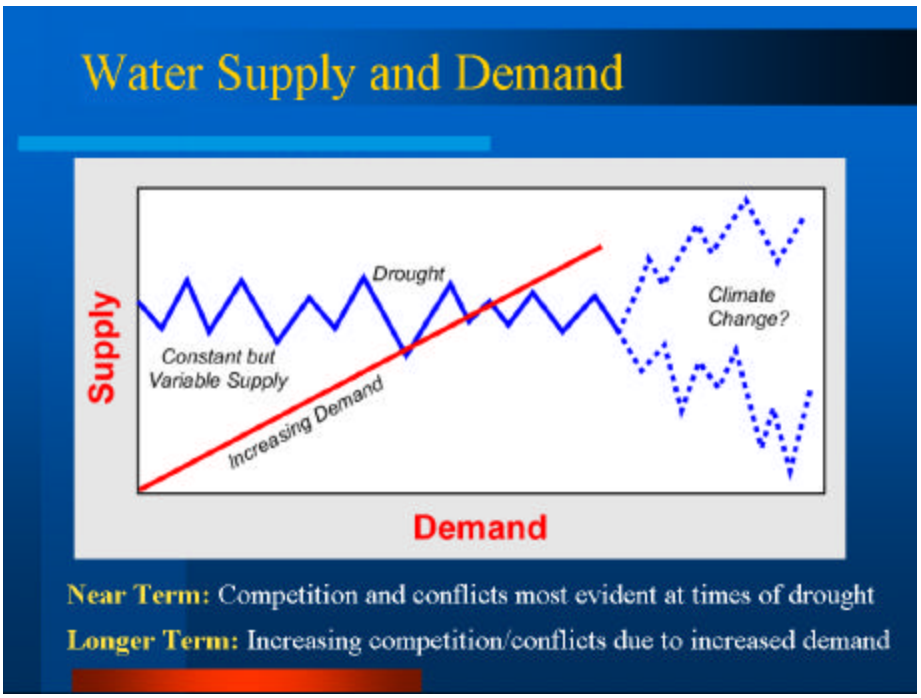


Figure 13. Water Supply and Demand (D. Winstanley, ISWS)

CHAPTER VII. WELLHEAD PROTECTION PROGRAM

Section 1. Publish wellhead protection and assessment data on the Illinois EPA Homepage

Two years ago a goal was set that the Illinois EPA would work to further enhance and integrate H_2O Works, Water Body System, and Arc/Info GIS to facilitate ground/source water assessment, delineation, and public access over the Internet to the Illinois EPA Home Page. This goal has been met. The source water assessment and protection Internet GIS became public in June 2001. To assist with making this information available to the public, this was publicized in a statewide press release issued on June 15, 2001.

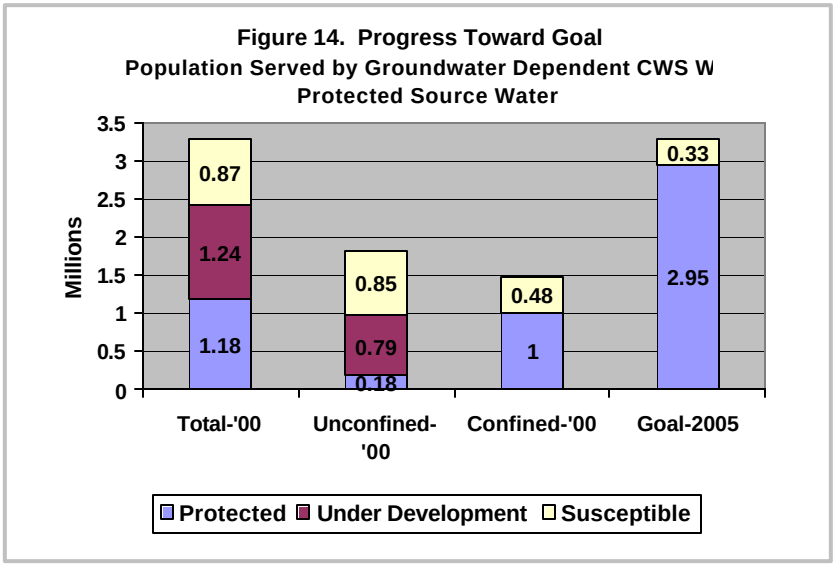
Under the Illinois EPA's SWAP, approved by U.S. EPA, the Illinois EPA has worked with the USGS to develop an Internet based GIS to provide the public with access to groundwater assessment and protection data. The primary components of the SWAP program are source-area delineation, contaminant inventory, and susceptibility analysis for each public water supply in Illinois. The information is available in the form of published Fact Sheets that provide a snapshot in time of the source water susceptibility and water quality for each public water supply, and also as a query-able on-line database of temporal and spatial data for each public water supply. Potential source inventory data from well site surveys and groundwater quality data for CWS wells is available through this system. This information assists in generating needed information that local governments use in adopting minimum and maximum setback zone ordinances; recharge area protection ordinances; or county groundwater protection programs. It is of vital interest to the USGS and Illinois EPA to supply this information to other local, state, and federal agencies as well as the general public and consultants.

> Source water assessment and protection program data for both the community and non-community water supplies is now available over the Internet at http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html. This information will allow for the development and application of a balanced management plan for the protection of groundwater resources.
>
> *Please note: Due to security concerns resulting from the events of September 11, 2001, the Illinois EPA has temporarily removed this website from public availability.*

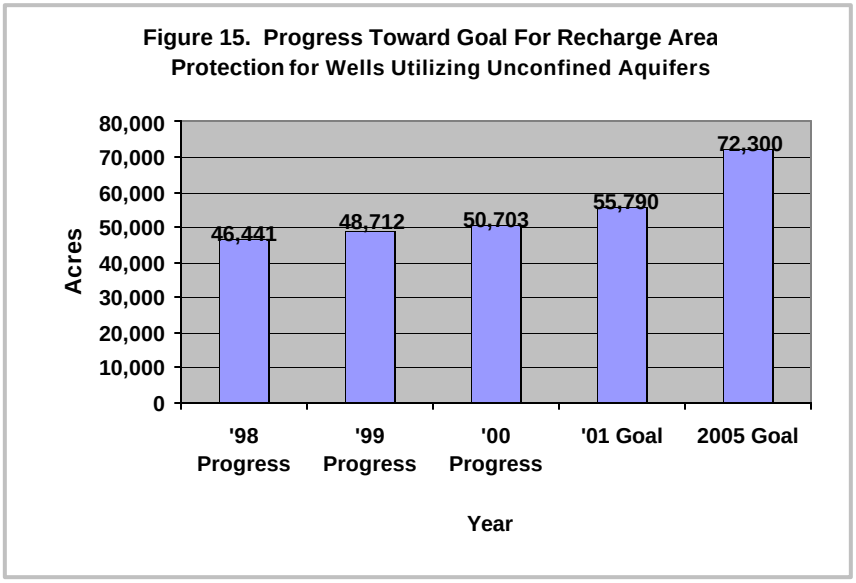
Wellhead assessments for NCWS wells have been greatly expanded during the past two years. The Illinois EPA has an interagency agreement with the IDPH to survey all NCWSs in the state. The IDPH and the county health departments are locating wells and intake structures and are identifying any potential sources of contamination within delineated source water protection areas. IDPH is plotting this information on aerial photos. Once plotting is complete the photos are scanned, registered, rectified, and digitized after being entered into the Illinois EPA's database for future use. As of June 2001, a total of 3,639 NCWS source water areas had been scanned, registered, rectified and digitized, out of a total of 4,100 NCWSs. The field verified location of NCWS and CWS wells is also being indexed to the ISGS's geological well log database. This will allow the capability for all the state agencies to access this information electronically.

Section 2. Increase the percentage of recharge acres with full protection progress established or under development (The goal is to increase the percentage of groundwater recharge areas (acres) with protection programs established or under development to 45 percent by the year 2005.)

The Illinois EPA has established a goal of increasing the percentage of groundwater recharge areas (acres) with protection programs established or under development to a level of 45 percent (72,300 acres) by the year 2005. Currently we have achieved 70 percent of this goal. Furthermore, a goal of protecting 90 percent of the state's population utilizing CWS groundwater sources by the year 2005 has been established.



The Illinois EPA has made considerable progress in meeting these groundwater protection goals through such initiatives as the groundwater standards, minimum and maximum setbacks; technology control regulations; regulated recharge areas; Regional Groundwater Protection Planning Programs, and the SDWA Monitoring Waiver Program. Illinois continues to address the need for protecting groundwater by accomplishing the mission set forth in the IGPA and through federal, state and local partnerships to establish groundwater protection programs. These partnerships have utilized regulatory and non-regulatory programs to achieve success. Illinois EPA is measuring the population served by systems with protected unconfined and confined aquifer resources.



Since approximately one million people in Illinois rely on susceptible unconfined aquifers for their source of drinking water, Illinois has placed added emphasis on the protection of these groundwater systems. The majority of CWS systems in Illinois are considered small systems. Thus, when compared to the overall population of the state, they may appear insignificant. However, when these small systems are adversely impacted by contamination, they often lack the available resources to address these concerns. Unlike larger water supplies, small supplies

may not have experts on staff to solve water quality problems or the rate base from which to draw funds for corrective measures. Therefore, protecting the resources utilized by these small water supply systems is critical.

Protecting the land surface areas around susceptible unconfined aquifer wells (recharge areas) can help prevent contamination of groundwater. Coupled with the population served, measuring the acres with protection programs under development or in place provides an effective measure of Illinois' progress in protecting these susceptible areas. Figures 14 and 15 illustrate the Groundwater Section's progress toward these groundwater protection goals.

Section 3. Continue to implement and integrate the WHPP elements into protecting the regional groundwater sources for public water supply wells

The Illinois EPA is the primary agency responsible for implementing this program and continues to make progress in completing this effort. However, there remains a great deal of work to be done in this area. Integration of WHPPs has been, and will continue to be, implemented for CWS wells in Priority Groundwater Protection Planning Regions.

There are certain programmatic indicators that show CWS groundwater protection progress within the Priority Groundwater Protection Planning Regions. In general, the first step of developing a CWS groundwater protection program involves determining the recharge area for CWS wells in unconfined aquifers utilizing existing aquifer property data. In Illinois, the recharge area is based on a five-year time of travel delineation. The second step involves determining the potential sources, potential routes, and the land use zoning within these recharge areas. The third step involves establishing a local team of stakeholders to develop a groundwater protection strategy, and most importantly, taking the necessary measures to implement these activities to protect groundwater resources. The last step is the development of a local emergency-planning document that addresses: natural disasters, chemical contamination and physical disruptions that threaten the supply and distribution network of the public water supply.

> Information on CWS well recharge areas, potential sources/routes and land use activities is now available at: http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html.
>
> *Please note: Due to security concerns resulting from the events of September 11, 2001, the Illinois EPA has temporarily removed this website from public availability.*

During the past two years, the Illinois EPA has continued to work on recharge area delineations for 25 prioritized CWSs within the Groundwater Protection Planning Regions. Of the 25 prioritized systems, 15 CWSs remain to be finished. These should be completed by February 2001. Figure 16 illustrates the recharge area delineation status (WHPP, step1) for the CWS within the Priority Groundwater Protection Planning Regions.

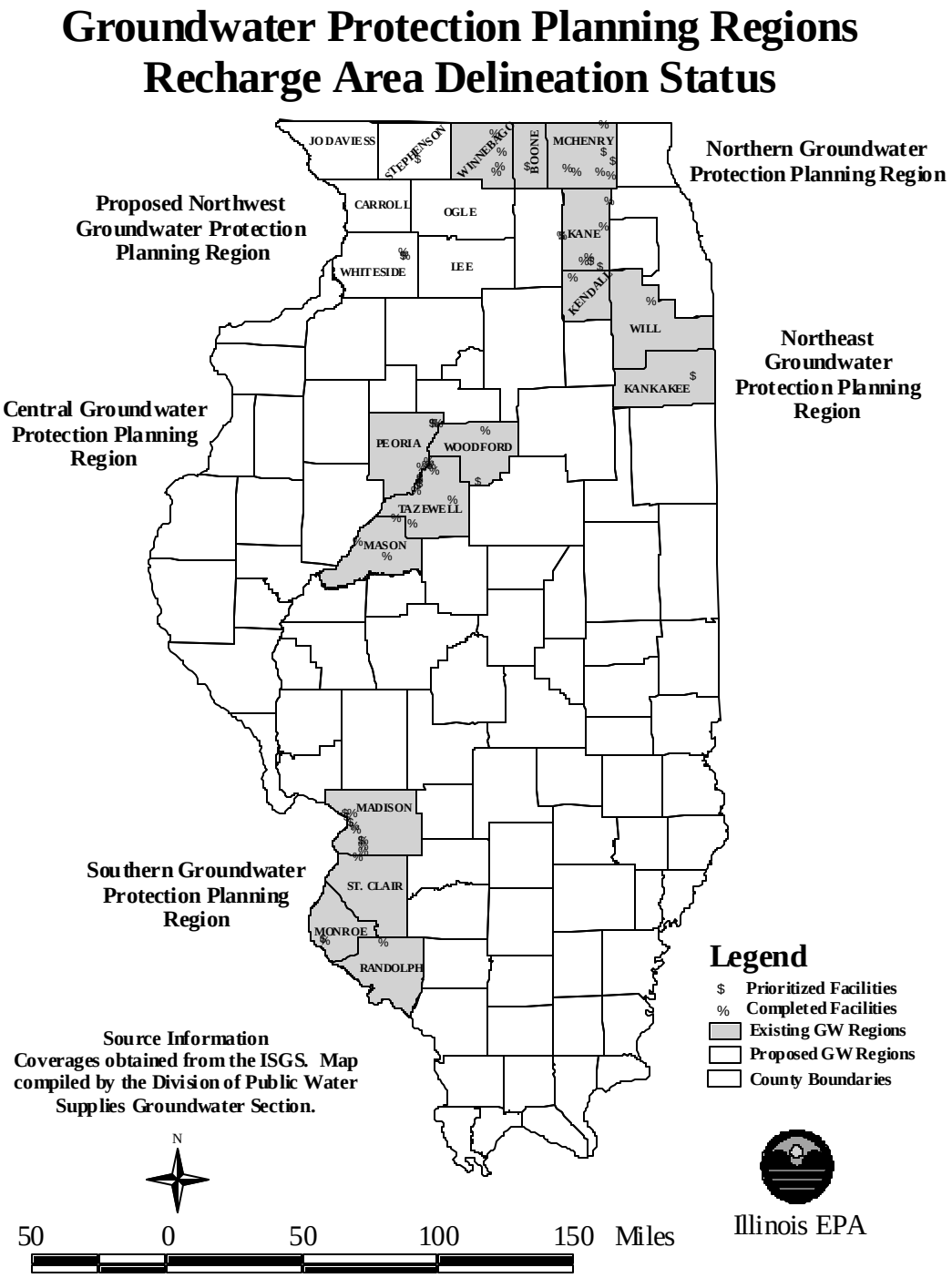


Figure 16. Groundwater Protection Planning Region Recharge Area Delineation Status

Section 4. Develop and implement source protection criteria to use in the planning, construction and location of new community water supplies

The Illinois EPA has developed procedures for CWS systems expanding through the construction of new wells. In addition to the setback requirements and other regulations under the Act, an outreach effort has been initiated to obtain the necessary hydrogeologic information to delineate source water protection areas for new wells utilizing unconfined aquifer settings as required under Section 1453 of the 1996 SDWA. In Illinois, much of the hydrogeologic information needed to complete a delineation is already required to be collected while the groundwater resource assessment is being conducted to determine the availability of groundwater at a proposed well site. An informational pamphlet is being provided to each CWS that submits an application to permit a new well. This process has resulted in the additional collection of aquifer property data. The Illinois EPA continues to utilize this data to complete delineations to serve as the technical support to CWSs wishing to initiate:

- maximum setback zones;
- eligibility for chemical monitoring reform/permanent-monitoring relief;
- lab fee cost savings;
- prevention programs including the P2 and conservation reserve programs.

Section 5. Continue to prioritize wellhead protection efforts within the Groundwater Protection Planning Regions

The Illinois EPA is the primary Agency responsible for implementing this groundwater protection goal. The Illinois EPA continues to work very closely with the regional planning committees to establish groundwater protection programs at the local level; however, these programs are very time consuming and significant work is needed in this area.

The Groundwater Section continues to coordinate with the regional groundwater protection planning committees to implement programs and assist with targeting local contacts and interest groups. Each regional committee has adopted specific mission goals and objective statements to advocate groundwater protection practices and procedures to municipal, county, state and other local units of government throughout their respective regions. These goals and objectives are useful in the prioritization and development of local groundwater protection programs, many of which are described in this Chapter.

Although each region has specific priorities and areas of concern, their mission statements all have common goals and objectives as described below:

GOALS

1. Provide education materials and programs regarding general groundwater protection.
2. Promote the use of groundwater protection tools to county and other local units of government that implement groundwater protection programs throughout the region.
3. Assist the state jurisdictions in accomplishing specific regional groundwater protection programs.

4. Provide a forum for the development of recommendations that address committee recognized regional protection needs.

OBJECTIVES

1. Maintain an on-going general education subcommittee to work with citizen groups, schools, governing agencies and other interested parties on the importance of groundwater protection.
2. Promote the use of voluntary best management and P2 programs for businesses and residences located within groundwater recharge areas.
3. Work with county, municipal, and other special units of government to implement groundwater protection tools such as local zoning, maximum setback zones, technology control regulations, and defining recharge areas.

STRATEGIES

1. Act as a catalyst for implementation of groundwater protection tools including presentations or meeting with local officials and businesses.
2. Conduct Groundwater Protection and Education Workshops for the general public or target audiences.
3. Focus on educating middle school teachers on the importance of incorporating groundwater science into their curricula.
4. Perform an annual self-evaluation review of program effectiveness.

During the past two years, the Illinois EPA and members of the Priority Groundwater Protection Planning Committees have met with local stakeholders to encourage the development of groundwater protection programs and to implement activities to protect CWS recharge areas. One of the most effective methods of encouraging local groundwater protection programs is through direct meetings with local stakeholders. The following information provides a summary of community programs that the regional committees have targeted for groundwater protection efforts.

Northern Groundwater Protection Planning Region (Winnebago, Boone, and Mc Henry counties) - The Northern Groundwater Protection Planning Committee has assessed their efforts, and the following provides a summary of these actions:

Loves Park- Representatives of the Northern Committee continued to assist with the Loves Park Drinking Water Protection Project, which is an ongoing program that was initiated during the fall of 1995. During the spring of 2000, a questionnaire was developed and mailed to businesses in the delineated capture zones for Loves Park Wells 1 and 2. As a follow up to this effort, 40 Environmental Geology students from Rock Valley College visited the businesses that received surveys, to thank them for their participation in protecting the water supply wells and to hand them a packet of P2 information that was specific to their type of operation. Later in the day, the students, along with representatives from the Northern Committee, held a press conference at the Loves Park City Hall, emphasizing the importance of protecting the groundwater before it becomes contaminated.

In early June 2000, the city of Loves Park and the Winnebago County Health Department hired an intern to survey the residential areas in the capture zone for Loves Park Well 1 and 2. The

intern informed the residents of the importance of protecting the groundwater from contamination to ensure good quality drinking water and the risk associated with improperly abandoned wells. As improperly abandoned wells were identified during the residential survey, the intern was instructed to offer free well sealing by a licensed well contractor. The city of Loves Park, Winnebago County Health Department, and the Northern Regional Groundwater Protection Planning Committee raised the funding associated with proper sealing of these wells. Because of this effort, 51 driven point wells and three drilled wells have been properly abandoned to date. During the summer of 2001, the same intern was hired by the city of Loves Park to continue surveying for abandoned wells in the area.

Pecatonica, Rockton, and Winnebago - Members of the Northern Committee initiated a pilot groundwater protection and education program beginning in 1999, through collaboration with teachers from Pecatonica, Rockton, and Winnebago High School Environmental Science classes. Generally, these efforts began with classroom presentations by members of the Northern Committee; however, involvement from other state and local agencies responsible for agriculture and natural resource issues have included: Winnebago County SWCD, IDA, University of Illinois Cooperative Extension, League of Women Voters Natural Resource Committee, and the Retired Senior Volunteer Program. The overall goal of this on-going project is to increase groundwater protection education and awareness in the Pecatonica, Rockton, and Winnebago area. The objective of this curriculum includes:

- Explain to the students the role geology and soils play in the vulnerability of groundwater to contamination in Winnebago County;
- Assist each student to evaluate their home and property for pollution and health risks using HomeACRE & FarmASyst;
- Teach importance of sealing abandoned wells on their property and demonstrate how to take a water sample from the student's private water well; and
- Offer free groundwater monitoring tests for private wells - in 1999 offered VOCs and pesticide screening with grant monies secured by SWCD from Illinois FarmASyst Pilot Grant Program. During 1999 and 2000, free bacteria and nitrate tests were provided by the Winnebago County Health Department. Also for the year 2000, Hononegah High School, the League of Women Voters Natural Resource Committee funded the pesticide screening, the U.S. EPA donated complete VOC testing, and bacteria and nitrate tests were provided by the Winnebago County Health Department.

North Park PWD - The North Park PWD continues to implement local groundwater protection efforts by participating in the Groundwater Foundation's National Groundwater Guardian Program. The North Park PWD has purchased additional road signs to enhance previous IDOT efforts. In addition, the water district is attempting to follow-up on previous P2 efforts by encouraging other local industries in participating in the P2 internship program.

Northeastern Groundwater Protection Planning Region (Kane, Kendall, Will, and Kankakee counties) - The Northeastern Groundwater Protection Planning Committee has assessed their efforts, and the following provides a summary of these actions:

- *St. Charles* - The city of St. Charles water supply protection program has been in place for a number of years, beginning with a Groundwater Protection Study and Plan completed in May of 1996. The city has adopted a groundwater protection ordinance that regulates certain types of land uses and establishes BMPs for permitted uses within the five-year capture zones developed as part of the study. Furthermore, the city of St. Charles is also participating in a study coordinated by the Kane County Department of Water Resources to develop a countywide plan to manage and protect source waters within the county.

- *Plano* - The city of Plano continues to work with the Northeastern Committee and the Illinois EPA to augment their WHPP. Local initiatives have included: a pilot project which targeted area farmers within the city's recharge areas; efforts with the IDA and Kendall County Soil and Water Conservation Office; and a graduate level P2 intern who completed a project at the Plano Molding Company, a plastic-resin injection molding processor. Most recently, the city has implemented procedures to comply with 35 Ill. ADM. Code 615 Subpart L: De-Icing Storage and Handling Units. These regulations are intended to minimize the risk posed by existing de-icing (road salt) storage areas located within well setback zones. In addition, to raise public awareness, road signs have been posted along state highways intersecting the city's recharge areas.

Central Groundwater Protection Planning Region (Peoria, Tazewell, Woodford, and Mason counties) - The Central Groundwater Protection Planning Committee has assessed their efforts, and the following provides a summary of these actions:

- *IAWC-Pekin* - The Central Groundwater Committee continues to work with the city of Pekin in the development and implementation of a comprehensive local groundwater protection program. The city of Pekin's groundwater protection program includes both regulatory and non-regulatory/public education components. Pekin adopted and implemented a comprehensive recharge area overlay protection ordinance and maximum setback zone ordinance in January 1995. The overlay-zoning ordinance has been used in the development of several site plans for new and expanded businesses. The Pekin Fire Department monitors the materials identified in the BMPs for not only the city of Pekin, but also for Tazewell County. In addition, the city coordinated with the Tazewell County Planning and Zoning Department to adopt a countywide groundwater protection ordinance that will protect a portion of Pekin's CWS recharge area located in the county's jurisdiction. This groundwater protection ordinance has served as a model for several other communities in the state. The city of Pekin's Groundwater Protection and Education Committee continues to participate in the Groundwater Foundation's Groundwater Guardian program by implementing "Result Oriented Activities" for local groundwater protection. This year, one of these activities includes continuing a storm sewer-stenciling project with area school children. In addition, the Public Works Department continues to post "Water Supply Protection Area" road signs that were erected on secondary roads indicating the boundaries of the city's CWS recharge areas.

The city, as well as the privately owned Illinois American Water Company (IAWC), has prepared contingency plans in an effort to control any "spills" in a recharge area of any of the communities' wells.

- *Pleasant Valley PWD* – Effective September 1, 2001 the Board officially established the first regulated recharge area in the state, a defined area with specific regulations in place to protect vital groundwater resources. The Pleasant Valley Public Water District (PWD), in Peoria County, actively sought the designation for the area contributing groundwater to its public water supply wells. The Illinois EPA developed the Pleasant Valley Regulated Recharge Area proposal in consultation with the GAC, and the Central Priority Groundwater Protection Planning Region Committee. The Board adopted the regulation, authorized under the IGPA, on July 26, 2001 following review and certification of no objection by the Joint Legislative Committee for Administrative Rules.

  The Central Groundwater Protection Planning Committee, GAC; Frank Woodson (former water supply operator) and Clark Engineers should be acknowledged for their significant contribution to the development of this regulation.

  The regulations prohibit the siting, within a regulated recharge area, of any new special or hazardous waste landfills, Class V Injection Wells (wells that are used to dispose of drainage water and certain other liquid wastes), or low-level radioactive waste sites. The regulations also specify certain technology control regulations for activities within 2,500 feet of wellheads and within a regulated recharge area. Specified new potential pollution sources must prepare recharge area suitability assessments for review and approval by the Agency prior to commencement of operations. The IDPH and the DNR are authorized to develop an assistance program for abandoned and improperly plugged water supply wells. The regulations also require the registration with the Illinois EPA of the location of new sources of potential groundwater contamination. The Illinois EPA held a required informational and registration meeting for all owners of existing potential sources during September 2001. Owners of some potential sources must develop and implement systems for chemical substance management and attend additional training programs to be conducted by the Illinois EPA.

- *Peoria and East Peoria* – The water supplies for the cities of Peoria and East Peoria, as well as the village of Mackinaw, and Peoria Heights, are all drawn from the Sankoty Aquifer. Since this aquifer is considered unconfined, in valley areas, potential groundwater contamination is a significant concern. An Illinois EPA P2 intern was placed at the Tazewell County Health Department during the summer of 2001 to continue the work of the previous three interns. This intern performed waste minimization opportunity assessments for 13 businesses in IAWC – Peoria community well recharge areas. The intern also performed re-assessments on six Mackinaw, East Peoria, and Peoria Heights businesses, helping them strive for continuous improvement. The intern also provided updates to the Central Planning Committees' website with information about the recently established rule for the Pleasant Valley regulated recharge area. A brochure was also developed and distributed by the intern to businesses within the regulated recharge area to inform them about this new regulation.

- *Tazewell County* – The Central Committee, with assistance from the Illinois EPA, coordinated with the Tazewell County Planning and Zoning Department to develop a countywide groundwater protection ordinance. The intent of this ordinance is to assist other community water supplies in the county by providing them a "generic" groundwater protection ordinance that can be adopted by local municipalities. The complete text of this document is now available on the Central Committee's website at http://www.dpc.net/~crgw

Southern Groundwater Protection Planning Committee (Madison, Monroe, St. Clair, and Randolph counties) - The Southern Groundwater Protection Planning Committee has assessed their efforts, and the following provides a summary of these actions:

- *Bethalto* - The village of Bethalto continues to work with the Southern Committee to augment their WHPP. Local initiatives have included: establishment of maximum setback zones for their CWS wells; development, publication, and distribution of a groundwater protection brochure; and a graduate level P2 intern who completed a project at several area automotive-related facilities. Furthermore, the village of Bethalto continues to implement local groundwater protection efforts by participating in the Groundwater Foundation's National Groundwater Guardian Program for 1999. The village is also in the process of developing a regulatory management program for groundwater protection. This effort is proving to be challenging and very difficult because most of the recharge area for the village's wells is located in the municipal jurisdiction of Wood River and East Alton. Therefore, a regulatory based groundwater protection ordinance or management program will have to rely on implementation by the Wood River and East Alton city governments. The village board is currently evaluating the feasibility of an intergovernmental agreement with the other two villages to accomplish this goal.

- *East Alton* – The village of East Alton became interested in groundwater protection due to the contamination of one of their CWS wells (as previously described). Despite all of the adversity associated with this groundwater contamination incident, the village of East Alton was awarded with a "Groundwater Shinning Star" Award for their innovative, science-based solution to a groundwater contamination problem and for protecting its well field. Representatives from the southern committee presented this award during a village council meeting on November 20, 2001. With assistance from the Illinois EPA, IRWA and the Southern Committee, the village of East Alton is currently working on groundwater protection measures such as establishing a maximum setback zone ordinance for their CWS wells and developing contingency planning procedures to protect their water supply from future problems. In addition, the village was recognized as a Groundwater Guardian Community for participating in the Groundwater Foundation's National Groundwater Guardian Program for 2001.

Section 6. Continue to implement groundwater protection programs for CWS and assist with targeting local contacts and interest groups

The Illinois EPA is the primary Agency responsible for implementing this groundwater protection goal. As part of Illinois' U.S. EPA-approved WHPP, Illinois must document and

report, on a biennial basis, the implementation status for CWS groundwater protection programs. This reporting frequency coincides with the IGPA Report and is available upon request.

Section 7. Continue integration and implementation of the WHPP under SDWA new alternative monitoring program

The Illinois EPA has also made significant progress in achieving local management programs by incorporating Well Head Protection Area (WHPA) management into the SDWA vulnerability waiver program. Under the WHPP, a WHPA area is defined and the potential sources of groundwater contamination are inventoried within this area. Following these steps, local stakeholders are involved in developing and implementing WHPA management plans. Given the natural geologic protection and/or management plans in these WHPAs, the vulnerability to contamination can be reduced or eliminated. To date, the Illinois EPA has received waiver applications from more than 760 CWSs. Approximately 605 of these facilities received a monitoring waiver through Illinois EPA endorsement of their WHPA management/protection plans.

Section 8. Finish the delineation of recharge areas for CWSs using reasonably available information

The Illinois EPA has been delineating the five-year recharge area of CWS wells utilizing unconfined aquifer systems. Historically, completion of these delineations has focused on CWSs located within Illinois' Priority Groundwater Protection Planning Regions, and under a vulnerability monitoring waiver program developed under the SDWA. There are approximately 99 communities that still require this delineation to be performed. The Illinois EPA has utilized four public universities with graduate hydrogeology programs to conduct delineations for 75 communities. The universities have completed 20 of these delineations. The universities are providing maps in electronic format with modeling output referenced to real world coordinates to allow for integration with the Illinois EPA's Arc/Info GIS. The Illinois EPA has selected a contractor to complete delineations for 32 CWSs. The Illinois EPA will be completing the delineations for the remaining 12 CWSs.

Illinois EPA continued to work toward an environmental goal of increasing the percentage of groundwater recharge areas (acres) with protection programs established or under development to 45 percent (72,300 acres) as shown in Figure 15 by the year 2005. Furthermore, Illinois EPA continued to strive for achieving a goal of 90 percent of the state's population, utilizing CWS groundwater sources, with protection programs in place or under development, by the year 2005, as shown in Figure 14. Statewide technical assistance to communities has been expanded to include the delineation of recharge areas and conducting source inventories within these areas. Recharge areas are being delineated, and any potential sources of groundwater contamination are being inventoried for CWSs using groundwater from unconfined aquifers. Coordination and technical assistance from the IRWA has also been provided to establish local teams for development of local groundwater protection programs.

To assist with meeting this goal the Illinois EPA established contracts with four state universities to conduct recharge area delineations for 75 CWSs using unconfined aquifers with available data necessary to perform groundwater modeling. The unpublished masters theses that have developed under this program with Illinois EPA are reference in the attached bibliography of

publications. The following table illustrates the recharge area delineation technical assistance progress made by the universities to date:

University	**Total Number To Be Complete**	**Total Number In Progress**	**Total Number Under Illinois EPA Review**	**Total Number Being revised**	**Total Number Completed**
Illinois State University	3	0	0	0	3
Northern Ill. Univ.	17	11	11	0	6
Northeastern Il. Univ.	17	15	7	8	2
Southern Il. Univ.	38	29	28	1	9
Totals =	75	55	46	9	20

Section 9. Modify CWS water well construction permit application procedures to include collection of information on potential sources and routes, well logs, pumping tests and chemical analyses

Illinois EPA continues to provide a copy of an informational pamphlet entitled "Wellhead Protection for New CWS Wells" to each facility making application for a new well. The purpose of this brochure was to encourage CWSs to obtain the data needed for them to take proactive steps to protect their source of water and the money invested to construct the new well. The brochure explains the benefits of protecting new wells from certain nearby high-risk activities, and contains steps for the CWS to follow during the well permit procedure. Illinois EPA will use the new well data to delineate the recharge areas and provide technical assistance for establishing maximum setback zones.

CHAPTER VIII. REGIONAL GROUNDWATER PROTECTION PLANNING PROGRAM

Section 1. Current committee flexibility should be maintained while assisting with conducting and supporting both new and follow-up efforts of encouraging local and regional groundwater protection programs.

As previously described in Chapter VI, the Illinois EPA is the primary agency responsible for developing and implementing this program. To date, the Illinois EPA has had some success related to the establishment of this activity. However, there is still much to be done.

The regional groundwater protection process has resulted in successful local coordination and outreach efforts that have benefited both private citizens and businesses in these high priority areas of the state (e.g., P2 interns, Groundwater Protection Field Days, well sealing demonstrations, etc.). Cooperative efforts with entities such as the Groundwater Guardian program will assist the regional groundwater protection process by providing national attention and recognition to CWS developing groundwater protection programs. Illinois EPA worked with the Groundwater Foundation to pilot a new program referred to as the "Groundwater Guardian Affiliate" program. The Illinois EPA worked with each of the four Priority Groundwater Protection Planning Regions to become Groundwater Guardian Affiliates and to commit to a series of "result oriented services." These result-oriented services include working with communities within their respective regions to implement local source water protection programs and become Groundwater Guardian Communities.

Other activities conducted by the Regional Groundwater Protection Planning Committees to support both new and follow-up efforts of encouraging local and regional groundwater protection programs are summarized below:

NORTHERN GROUNDWATER PROTECTION PLANNING COMMITTEE

The Northern Groundwater Protection Planning Committee accomplished a number of tasks over the past two years. The Committee identified two main goals: public education, and local government technical assistance.

In addressing the first goal, the Committee evaluated various methods to most effectively educate the public. The Northern Committee has facilitated public education through participation in several forums. The first forum was the Boone County Groundwater Protection Field Day held at Ringland-Johnson Construction Company. The agenda included a presentation describing how Ringland-Johnson Construction developed their Groundwater Protection Plan. There was also a Groundwater Field Day at Aberdeen Subdivision. This program included information addressing proper storage, handling and application of common household chemicals and fertilizers. Certificates for a free water test were offered to the first 10 Field Day participants. The Committee sponsored a 10th Anniversary Celebration in Winnebago County at Klehm Arboretum and Botanical Gardens. Fourteen people received awards for their significant contribution in protecting groundwater in Winnebago, Boone, and McHenry counties. The Committee also participated in the Boone County Fair in Belvidere along with Boone County SWCD. The Committee again co-sponsored another program on groundwater protection: the Youth Groundwater Festival held at Rock Valley Community College in Rockford. This annual

festival has become a very popular event with support from the Winnebago County Health Department, Burpee Museum of Natural History, Rock Valley College and the League of Women Voters.

The second goal, local government assistance, is an effort to provide technical support to local governments and water supplies in the development of groundwater protection programs. The Northern Committee continues to work with Rock Valley College students and the city of Loves Park on the Loves Park Drinking Water Protection Project. In May 2000, Rock Valley College students visited 40 businesses within the delineated capture zones of Loves Park Wells 1 and 2. The Northern Committee is also planning formal presentations to the County Boards in Winnebago, Boone, and McHenry counties to assist them with groundwater protection programs. The first presentation was held on September 5, 2001 with the Winnebago County Planning and Zoning Committee. The purpose of this presentation was to encourage the county to include public water supply wells with the wellhead protection areas as a layer on their WINNGIS coverage. This type of information would be a key component to the development of a countywide groundwater protection ordinance being encouraged by the Northern Committee.

In June 1999, the Northern Regional Groundwater Protection Planning Committee purchased bentonite to be used for the closure of abandoned wells. The local health departments within the Priority Region have the approval to utilize this bentonite to abandon wells either through a hardship case or through related programs such as FarmASyst/HomeACRE. When bentonite is purchased, that money is used to buy more that makes it a revolving program. During the late fall of 2000, there were 34 wells sealed in city of Loves Park using this bentonite program.
In spring of 2001, the Committee began working with the Environmental Science for Teachers Committee, a Boone and Winnebago counties endeavor, to offer teachers a 3-credit Environmental Science class (Master Degree credit through Aurora University). The goal of the Committee is to offer a groundwater protection workshop for teachers during the summer of 2002, with members of the Committee teaching various aspects of groundwater protection, including building a groundwater model for teachers to take back to the classroom.

The Committee continues to participate in the National Groundwater Foundation's "Groundwater Guardian Affiliate" program. Beginning in 1997, the Committee annually develops and implements Result Oriented Services, which has proven to be a good method to focus the Committee's outreach and educational goals of the year.

NORTHEASTERN GROUNDWATER PROTECTION PLANNING COMMITTEE

The Northeastern Committee has accomplished a number of tasks over the past two years. The main focus of the committee has been to promote a Groundwater education curriculum for school districts within the region.

The Northeastern Committee successfully completed a pilot project modeled after the Illinois Middle School Groundwater Education program for the remaining two counties within the committee's boundaries. Partnering with the Regional Offices of Education in Kendall, Grundy, Kankakee and Iroquois counties, as well as several state, local and regional agencies, over 100 teachers were introduced to Illinois' groundwater curriculum: H2O Below, and were provided a groundwater model and other curricular tools to bring groundwater education into the classroom. In April 2000, 45 teachers from Kendall and Grundy counties participated and completed the

project. Fifty teachers from Kankakee and Iroquois counties followed in April 2001. In addition to providing the project to educators, the committee has provided consumable materials to assure the continuance of groundwater education to students. Surveys to assess additional training needs from participating teachers were distributed, the results of which will be evaluated for Northeastern Committee's future consideration.

The committee also initiated a pilot program to address proper sealing of abandoned wells within the region. During the summer of 2001, the committee purchased bentonite to be used for the closure of abandoned wells. The local health departments within the priority region have the approval to utilize this bentonite to abandon wells either through a hardship case or through related programs such as FarmASyst/HomeACRE. During the first year of this effort, the committee provided this material at no cost, to promote this initiative. Other groundwater education activities sponsored by the Northeastern Committee include:

- "Groundwater Protection Field Day" held in Kane County during May 2000, and in Will County in 2001, focusing on educating elementary school students in a variety of hands-on activities and learning opportunities;
- Continued maintenance of a traveling Lending Library that has been developed and made available upon request to communities/school districts within the region for groundwater education;
- Building an additional Lending Library and updating original materials (2001);
- Continued participation in the Groundwater Foundation's "Groundwater Guardian Affiliate" program; and
- Developed a pilot program to facilitate expedited sealing of improperly abandoned wells throughout the region.

CENTRAL REGIONAL GROUNDWATER PROTECTION PLANNING COMMITTEE

The Central Committee has accomplished a number of activities over the past two years. These activities can be broadly categorized as: regulatory testimony before the Board, public education, and local government/business assistance. After many years of development, the Board adopted the Pleasant Valley Regulated Recharge Area regulation on July 26, 2001. These rules became effective September 1, 2001, and establish the state's first regulated recharge area under Section 17.3 of the Act. The Central Groundwater Protection Planning Committee should be acknowledged for their significant contributions to this effort. The committee was instrumental in getting this proposal developed and adopted. Like Pekin and the Tazewell County Groundwater Protection Ordinance, the Pleasant Valley regulation is a state and national model. The committee continues to assist with the implementation of groundwater protection in Pleasant Valley through the efforts of their graduate P2 intern who has updated the committee's website, verifying the businesses within the regulated recharge area, and making a brochure for existing businesses within the recharge area to inform them about the regulation. Further, the intern is working with a team from the Illinois EPA's Office of Small Business, Office of Pollution Prevention, and Groundwater Section to implement the door-to-door notification and to prepare training materials for the required registration and informational meeting, and for the training session.

As described above, the Central Groundwater Committee, with assistance from the Illinois EPA has been able to provide interns to work with local businesses in the region. To date, four P2 interns have worked out of the Tazewell County Health Department to conduct waste minimization opportunity assessments for local businesses within recharge areas of CWS wells. This effort has proven to be an extremely successful program with 72 small businesses having assessments completed during the four-year period, 38 of them in the last two years. To help measure the effectiveness of the previous intern's waste minimization recommendations, six local businesses agreed to participate in re-assessments during the fourth year. The use of P2 interns to conduct waste minimization assessments in community well recharge areas has been very beneficial as the majority of the businesses are small, and have no one knowledgeable in P2 alternatives.

The Education subcommittee continues to be very active in promotion of groundwater awareness and protection programs throughout the region. Three of the four local health departments within the central region continue to promote the HomeACRE program, as appropriate, within well recharge areas. In addition, the committee continues to sponsor low cost water screening analysis for private well owners, as requested. This year, the committee presented awards to science fair participants with projects dealing with groundwater at the Illinois Junior Academy of Science Fair. The committee also co-sponsored and participated in the "Clean Water Festival," held at the Assembly Hall in Peoria. During the 2001 Festival, over 4,500 school children and teachers participated in this event.

The Central Committee continues to participate in the Groundwater Foundations' "Groundwater Guardian Affiliate" program. The committee annually develops and implements Result Oriented Services that provide support to the Groundwater Guardian Community of Pekin. The committee continues to sponsor an annual Groundwater Protection Recognition Awards program. Each year, these awards are given in four different categories: Teacher, Student, Individual, and Community/Organization. Nominations are submitted to the Education Subcommittee chairperson, and annually the Education Subcommittee selects award recipients

SOUTHERN REGIONAL GROUNDWATER PROTECTION PLANNING COMMITTEE

The Southern Groundwater Protection Planning Committee continues to be very active in promoting groundwater protection activities within the region. The committee has established an ongoing educational sub-committee that plans all educational events the committee hosts. An educational outreach campaign is being developed to promote groundwater protection to various county and local governmental agencies. The committee has an interest to encourage local stakeholders to become more aware and active in groundwater protection strategies throughout the region. The mission of the committee is to advocate groundwater protection practices throughout the Southern Planning Region. To assist in fulfilling this mission, the committee annually develops a work plan to assist in completing tasks.

On May 12, 2000, a Groundwater Protection Field Day was held in Madison County. Approximately 60 people attended this field day. The day focused on groundwater protection with specific emphasis placed on storm water management issues. The field day provided an overview of the current local initiatives to bring the Metro-East area in compliance with new National Pollutant Discharge Elimination System (NPDES) mandates. An overview and tour of Lock & Dam 26 in Alton, Illinois, was also part of the field day.

An informational campaign continues to collect and develop materials regarding groundwater protection to give to various governmental and local agencies. The committee has an interest to encourage local stakeholders to become aware and active in groundwater protection strategies throughout the southern region. Early in 2000, a campaign was successfully led by the committee to establish road signage indicating "Water Supply Protection Areas" along the sensitive Karst corridor in Monroe County. A total of 18 signs were posted along five Illinois Highways, and all community leaders were notified of the project and given materials to initiate a public awareness campaign within their own community.

In addition, during October of 2000, the committee constructed eight new groundwater flow models with Karst feature inserts. The new models went to local health departments, and other agencies that will utilize the models to demonstrate the importance of groundwater protection to interested individuals in schools, fairs, etc. This was an attempt to foster community involvement in programs that protect groundwater as a precious resource.

On March 16, 2001, members of the committee participated in the St. Clair County Teachers Institute Day in Belleville. An hour-long demonstration on using the groundwater flow model as a teaching tool in the classroom was presented to middle school and high school teachers. The committee raffled two flow models at the end of the session for teachers to have and use in their schools.

On May 18, 2001, the committee held its annual Groundwater Protection Field Day in Millstadt, Illinois. This field day was designed primarily for homeowners, and utilized the "HomeACRE" manual to assist in disseminating information about assessing and evaluating the health and safety of their home environments. Presentations discussed water quality, onsite wastewater disposal, hazardous household wastes, yard care, air quality and other environmental topics. This Field Day was very successful, with over 41 people in attendance.

The Committee continues to participate in the National Groundwater Foundation's "Groundwater Guardian Affiliate" program. Beginning in 1997, the Committee annually develops and implements Result Oriented Services, which has proven to be a good method to focus the Committee's outreach and educational goals of the year.

CHAPTER IX. NON-COMMUNITY AND PRIVATE WELL PROGRAM

Section 1. Continue to implement the WHPP, and assist with implementing the technology control and groundwater quality standards regulations

IDPH has primary responsibility for inspections of approximately 4,200 NCPWSs, which are performed at least once every two years. At the time of these inspections, the area surrounding the wellhead is inspected for sources of contamination. Permits for new construction, modification or an extension of an existing non-community water system will continue to be required.

Section 2. Complete the source water assessments of all NCPWs

Required by amendments to the Sate Drinking Water Act, IDPH is completing source water assessments of all NCPWSs. Approximately 6,000 water wells and 38 surface water sources serve as the sources of water to these systems. These wells and surface supplies are being identified and evaluated as to their vulnerability to potential contamination from sources such as sewage systems, abandoned wells, buried fuel tanks and chemical storage areas. The vulnerability assessments conducted in the past were confined to an area within a 200-foot radius around the well. This new initiative expands that radius to 1,000 feet. The location of the wells and any potential source of contamination within this radius have been identified and are accessible at http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html.

NCPWS wells are being digitized from registered aerial photographs which have had well location(s) drafted onto them. During the field survey for the well, potential sources of contamination within 1000 feet are identified and drafted onto the photograph as well. Each site is described on a standardized coding form, and is then entered into Illinois EPA's Waterworks Database (H2O Works) database. As of June 1, 2001, 15,604 potential contamination sources have been entered into the database and digitized.

This project brings together resources from the IDOT, Illinois EPA, local health departments, and IDPH. IDOT is providing aerial photographic maps of the area surrounding each supply and Illinois EPA is entering the data into a GIS data system. This project began in 1998 and will take three years to complete. Federal funding through U.S. EPA is supporting this effort. Local health departments are being compensated from this fund for conducting the assessments. IDPH regional staff is conducting assessments at supplies in facilities that are either licensed by the Department or located in counties where there are no local health departments. IDPH will use the data collected from the source water assessments to write a susceptibility assessment for each supply. IDPH will also consider land use, previous sampling data and geological data. The susceptibility report will determine, from the information, if the supply is susceptible to contamination. When completed, copies of these reports will be sent to Illinois EPA and the water supply.

Section 3. Complete GIS coverage for all NCPWSs

Presently underway, 3,379 of approximately 4,200 NCPWSs wells have been digitized in 87 counties as of June 1, 2001. This has been accomplished by taking aerial photographs, which have been drafted with well location from field surveys, and registering them against the county road coverage. Once registered, in real world coordinates, the photos are displayed and the well location is digitized into a statewide coverage from its drafted location on the photograph.

Section 4. Begin certification training of non-transient, NCPWS operators

In accordance with amendments to the federal SDWA and recent U.S. EPA drinking water regulations, all non-transient, NCPWSs must be operated by personnel who have attained training approved by the Department. Certified operators will be required to be re-certified every three years by attending a training session approved by the Department that addresses new technology and new drinking water regulations.

Program staff has met with the Water Quality Association to develop the curriculum. That Association provides training to operators of small water systems and has developed materials and courses similar to the training that will be required for non-transient, non-community operators. Training sessions are scheduled to begin in the fall of 2001.

There are approximately 438 non-transient, NCPWSs that will need certified operators. IDPH is presently grandfathering the existing operators. Rule amendments have been adopted that will require all operators to attend this training or other training approved by the Department by January 1, 2003. Congress has authorized a special fund to be used by states to pay for the cost of training of operators. The Department has applied for this special grant to pay for these costs and has hired a person to coordinate the training program.

Section 5. Continue to inspect and perform laboratory analyses on water samples collected from NCPWSs

Under the authority of the IGPA, Section 9, the IDPH has primary responsibility for the inspection of all NCPWs, performed at least once every two years. At the time of these inspections, the area surrounding the wellhead is inspected for sources of contamination.

Water samples are collected from all NCPWSs and tested by certified laboratories for the presence of coliform bacteria and nitrate concentration. All NCPWSs are sampled quarterly the first year for coliform bacteria. Thereafter, the frequency of coliform bacteria testing is based on the population a particular supply serves. NCPWSs serving populations less than 1,000 must be tested at least once per year. For populations greater than 1,000, the sample frequency is the same as CWSs. As a minimum, all NCPWSs are tested for nitrate concentration once every year.

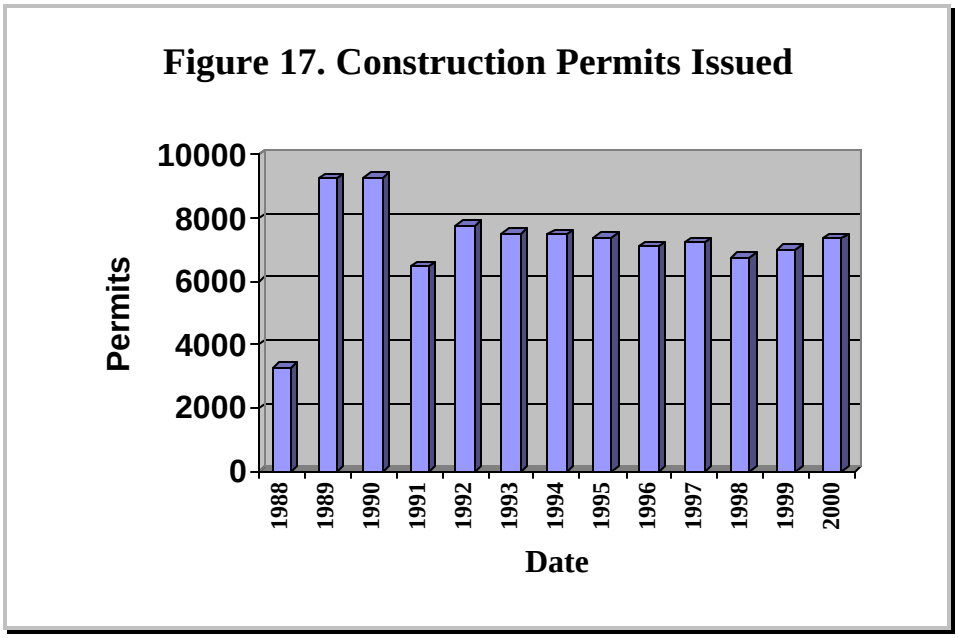
Non-transient non-community water systems - Of the 4,200 NCPWSs, approximately 438 are non-transient, NCPWSs. A non-transient, NCWS is one that serves the same 25 or more individuals at least six months a year, such as schools and workplaces. About half serve schools. Under the SDWA, there are 83 requirements regarding the testing of water samples for contaminants and treatment methods.

Section 6. Continue to issue permits for the construction, modification or extension of existing NCPWSs

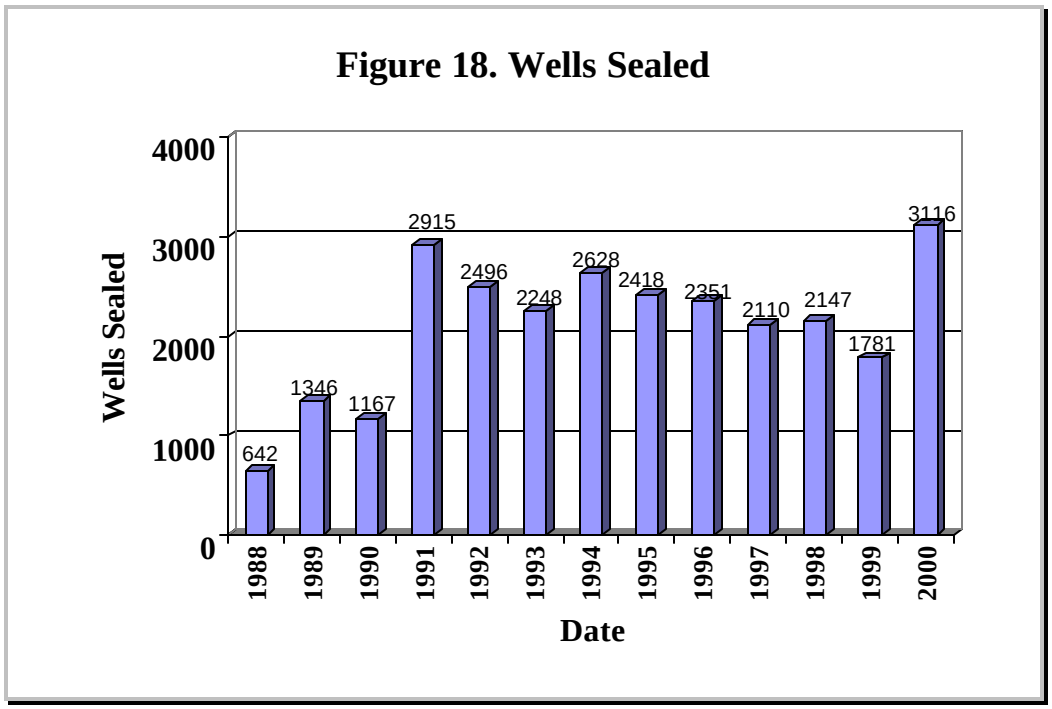
Approximately 92 permits are issued each year for the construction, modification or an extension of an existing NCPWS. NCPWSs in Illinois serve a population of approximately 552,500 citizens. These are water systems that serve 25 or more people for at least 60 days per year. Examples are water systems that serve schools, restaurants, factories, power generating stations, office buildings, campgrounds, state parks and rest stops, etc.

Section 7. Continue the issuance of permits for all types of water wells with the exception of CWS wells

During the last two years, approximately 7,200 permits to construct private, semi-private, non-community and non-potable water wells were issued annually by IDPH and 85 local health departments. Figure 17 illustrates the number of water wells permitted during 1988-2000. All new wells are inspected to ensure that location and construction specifications have been met in accordance with the requirements of the Illinois Water Well Construction and Pump Installation Codes. In accordance with the IGPA, all new wells must be located at least 200 feet away from all primary and secondary sources of contamination and all potential routes. Additionally, water samples from new wells are tested by certified laboratories for the presence of coliform bacteria and nitrate concentration.



Of major significance was the increase in the number of abandoned wells that were sealed. During the year 2000, approximately 3,116 abandoned wells were sealed. This is an increase of 1,335 or 75 percent over the number of wells sealed in 1999, when 1,781 wells were sealed. This is both the highest number and the largest increase in the number of wells sealed since the IGPA became effective on September 24, 1987. Local health departments and IDPH inspect the sealing of abandoned wells to ensure they are properly sealed in accordance with the Illinois Water Well Construction Code. Figure 18 illustrates the number of water wells sealed during 1988-2000.



Section 8. Finalize and implement the amendments to the Illinois Water Well Construction Code initiated in 1999

Amendments to the Illinois Water Well Construction Code became effective on August 1, 2000. The purpose of these amendments is to keep the Code up-to-date with current industry standards and to clarify existing requirements regarding water well construction. These amendments primarily impact the procedures for constructing drilled wells and the sealing of abandoned dug and bored wells.

The purpose of grouting is to prevent the migration of contaminants through the annular space (the space that is between the borehole and the well casing) and into the well and aquifer that the well penetrates. In the construction of drilled wells, the minimum borehole diameter was increased and the minimum grouting depth was established. Procedures for grouting the annular space were both clarified and expanded.

A subsection was added to clarify three procedures for sealing abandoned dug and bored wells. In this subsection, an additional procedure for sealing abandoned bored and dug wells was established. The new procedure specifies the placement of alternate layers of bentonite and agriculture limestone (limestone fines). In the past, there were no requirements for sealing bored wells constructed with buried slabs. Construction of these wells began approximately 40 years ago and as they become aged, an increasing number of these wells are being abandoned. Requirements for sealing these wells were established in a new subsection. The sealing procedure requires disinfected clean pea gravel or limestone chips to be placed to within one foot below the buried slab. The upper part of the well, to where the casing is removed, shall be sealed with neat cement or bentonite.

The requirements for monitoring and closed loop heat pump wells remain in effect. The Illinois Water Well Pump Installation Code requires a backflow device where a chemical injection system is connected directly to a water well used for irrigation and which is not used as a potable water supply.

Section 9. Continue continuing education training sessions for licensed water well and pump installation contractors

Continuing education requirements for licensed water well and pump installation contractors - An amendment to the Water Well and Pump Installation Contractor's License Act requires all licensed water well drillers and pump installation contractors to have attended a continuing education session by January 1, 2000. In order to renew a license, a contractor must have provided proof of attendance by that date. Thereafter, contractors are required to attend six hours of continuing education every two years and to submit proof such as a certificate from the training organization.

The above legislation required plumbers who install or repair water well pumps and pumping equipment to obtain a pump installation contractor's license after January 1, 1999, and to have attended continuing education sessions by January 1, 2000, and every two years thereafter. However, plumbers are not required to take the water well pump installation contractor's license examination or to pay the license fee. They are only required to make application for the license.

The training sessions, which must be approved by IDPH, are intended to increase a contractor's knowledge by providing new industry information and updates, as well as to allow health officials to bring current problems to the attention of the industry. Topics for the 2000-2001 sessions included amendments to the Illinois Water Well Construction Code, groundwater contamination, well drilling machine hydraulics, well problems and solutions, disinfection, water treatment, abandoned wells, repairing water well pumps, grouting, pressure tank sizing, variances and safety. Approximately 400 water well contractors and 1800 water well pump installation contractors, licensed by the Department, are required to attend these training sessions. Seventeen training sessions were held throughout the state during 2000-2001. All but two of these sessions were conducted through the Illinois Association of Groundwater Professionals.

Amendments to the Illinois Water Well and Pump Installation Contractor's License Code became effective on August 1, 2000. The purpose of these amendments is to keep the Code up-to-date

with current industry standards and to clarify existing requirements regarding continuing education for licensed water well and pump installation contractors. A new section was established to clarify the requirements for the renewal of expired licenses. Four sections were added to establish requirements for continuing education.

Section 10. Continue to conduct training sessions pertaining to both the NCPWS and private water programs for local health department and IDPH water program staff

Training sessions for local health department and IDPH water program staff - Water program staff from 85 local health departments and IDPH attended 20 water program-training sessions throughout the state. Seventeen of the sessions coincided with the above sessions for licensed water well and pump installation contractors. The remaining three sessions were field-day grouting demonstrations that were especially tailored for health department water program staff. Presented primarily through the Illinois Association of Groundwater Professionals, the sessions were approved by IDPH as meeting the annual water program-training requirement for local health department water program staff under the Local Health Protection Grant Rules (77 Ill. Adm. Code 615).

CHAPTER X. GROUNDWATER PROTECTION RECOMMENDATIONS AND FUTURE DIRECTIONS

The following groundwater protection efforts recommended for the next two years are based on the results of the self-assessment and environmental indicators presented in this report. In some tasks, the priority may be shifted due to funding constraints. The overall groundwater quality protection indicator shows that the overall progress of implementing the IGPA continues to be adequate. However, proactive groundwater protection measures for new CWS wells need to be improved. In addition, efforts and resources should continue to focus on critical regional recharge areas supporting unconfined CWS wells. Furthermore, the review and development of recommendations regarding groundwater quantity issues should be a priority.

ICCG Operations

- Assist the GAC in the review and development of recommendations pertaining to groundwater quantity issues;
- Enhance coordination between Illinois EPA BOW and Land Remediation Programs;
- Continue to review and update the Implementation Plan and Regulatory Agenda;
- Update the ICCG/IGPA Research plan and integrate the recent ISWS and ISGS plans;
- Continue to hold quarterly meetings;
- Provide liaison for the GAC;
- Continue to assist with implementation of a fully-integrating CSGWPP vision statement and proposed changes in U.S. EPA policies and programs in support of the vision statement;
- Assist in implementation of the Illinois Generic Management Plan for Pesticides in Groundwater;
- Review and support the annual groundwater education work plan;
- Evaluate the development of Class III Special Resource Groundwater for Dedicated Nature Preserves; and
- Review regulated recharge area proposals.

GAC Operations

- Per the request of the Governor's Office, review and make recommendations regarding groundwater quantity issues for the next legislative session;
- Conduct policy related meetings; and,
- Provide input to programs, plans, regulatory proposals and reports as appropriate.

Education Program for Groundwater Protection

- Coordinate and conduct a statewide education program with an annual evaluation and work plan involving local, regional and state organizations and agencies. Support the integration of groundwater protection into state and local agency educational programs;
- Support regional groundwater protection committees with special education programs based on regional needs. Emphasize programs for wellhead protection involving local water, planning, and health authorities;

- Through educational institutions and organizations, curriculum projects, and teacher workshops, integrate groundwater principles and groundwater protection into the curriculum for grades 3-12, emphasizing correlation with Illinois Learning Standards;
- As groundwater recharge maps are published for community water supplies, provide educational programs to improve understanding and to develop community actions involving teachers and students;
- Organize and conduct educational programs for private well owners, involving licensed water well contractors, local health departments, SWCDs, University of Illinois–Extension offices, and other organizations. These programs will address well abandonment, nutrient and pesticide management, wellhead protection, disinfection, testing, operation and maintenance methods;
- Support field days and demonstrations conducted by SWCDs under the IWWAP.
- Maintain an easily readable and useful newsletter and closely related electronic bulletin board for communication with newsletter editors, communicators, water professionals, committee persons, educators, and agency representatives with groundwater protection interests. Secure interesting articles from these clients for publication;
- Secure funding to continue the Illinois Middle School Groundwater Project and other educational projects identified in the annual work plan.

Groundwater Evaluation Program

- Develop a white paper and legislation to support additional funding for groundwater monitoring and protection resource needs;
- Continue to improve the SWAP GIS to include more interactive features;
- Continue to share GIS coverages in an electronic format and continue to automate the groundwater resource data base for Illinois;
- Continue to conduct groundwater assessments and share the information through regular updates and completed reports;
- Continue to utilize innovative and cost effective methods to implement statewide groundwater quality monitoring;
- Begin assessing pesticide metabolites and other emerging contaminants of concern; and
- Continue to implement and improve overall groundwater quality indicators.

Groundwater Quality Standards and Technology Control Regulations

- Evaluate the need to develop Class III: Special Resource Groundwater Standards;
- Evaluate dedicated Nature Preserves for Class III designation;
- Develop proposed groundwater quality standards for emerging contaminants of concern;
- Continue to implement and integrate the groundwater quality standards into environmental programs;
- Continue to update and amend the groundwater standards to parallel the drinking water standards adopted by U.S. EPA;
- Continue to implement preventive notice and response programs and integrate with environmental programs;
- Continue to implement the technology control regulations and improve a database for tracking and evaluating compliance data;

- Evaluation of activities located proximate to CWS where local groundwater protection management efforts are completed or in progress will be given priority;
- Evaluation and compliance determinations for activities referred by permit programs will also be given priority; and
- Continue cooperation between the Illinois EPA and the IDPH to provide statewide education seminars on the implementation of the technology control and groundwater standards regulations.

Wellhead Protection Program

- Continue to publish wellhead protection and assessment data at http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html;
- Increase the percentage of recharge acres with full protection progress established or under development (The goal is to increase the percentage of groundwater recharge areas (acres) with protection programs established or under development to 45 percent by the year 2005.);
- Develop and implement source protection criteria to use in the planning, construction and location of new community water supplies;
- Continue integration and implementation of the WHPP under SDWA new alternative monitoring program; and
- Finish the delineation of recharge areas for CWSs using reasonably available information;
- Modify CWS water well construction permit application procedures to include collection of information on potential sources and routes, well logs, pumping tests and chemical analyses.

Regional Groundwater Protection Planning Program

- Current committee flexibility should be maintained while assisting with conducting and supporting both new and follow-up efforts of encouraging local and regional groundwater protection programs and
- Continue to implement and integrate the WHPP elements into protecting the regional groundwater sources for public water supply wells;

Non-community and Private Well Program

- Continue to implement the WHPP, and assist with implementing the technology control and groundwater quality standards regulations;
- Complete the source water assessments of all NCPWSs;
- Complete GIS coverage for NCPWSs;
- Begin certification training of non-transient, NCPWS operators;
- Continue to inspect and perform laboratory analyses on water samples collected from NCPWSs;
- Continue to issue permits for the construction, modification or extension of existing NCPWSs;
- Continue the issuance of permits for all types of water wells with the exception of CWS wells;
- Implement the amendments to the Illinois Water Well Construction Code initiated in 2000;
- Continue supporting education training sessions for licensed water well and pump

installation contractors;

- Continue to conduct training sessions pertaining to both the NCPWS and private-water program for local health department and IDPH water program staff.
- Finalize conversion of the IDPH database onto the SDWIS State.

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