



Illinois Groundwater Protection Program

Biennial Comprehensive Status and Self-Assessment Report

Executive Summary



The State of Illinois recognizes the essential and pervasive role of groundwater in the social and economic well-being of the state, and its vital importance to the general health, safety, and welfare of its citizens.

--Illinois Groundwater Protection Act



*Prepared by the
Interagency Coordinating Committee on Groundwater*





ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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DOUGLAS P. SCOTT, DIRECTOR

217/782-3397

January 9, 2008

The Honorable Rod Blagojevich
Governor, State of Illinois

The Honorable Members
of the Illinois General Assembly

I am pleased to transmit the Executive Summary for the tenth Biennial Comprehensive Status and Self-Assessment Report of the Illinois Groundwater Protection Program, which has been prepared pursuant to Section 4(b)(8) of the Illinois Groundwater Protection Act. The Act created a comprehensive, prevention-based policy focused on protecting the beneficial uses of groundwater and preventing degradation.

The biennial report provides a policy perspective on groundwater quality and quantity planning, protection, and management in Illinois. The Interagency Coordinating Committee on Groundwater prepared the report with input from the Groundwater Advisory Council and the four priority regional groundwater protection planning committees.

This Executive Summary presents highlights of the comprehensive status and self-assessment for the 2006 and 2007 reporting period. For a copy of the complete report please contact the Illinois EPA's Groundwater Section at 217-785-4787. You may also download the report at <http://www.epa.state.il.us/water/groundwater/groundwater-protection/index.html>.

Very truly yours,

A handwritten signature in blue ink that reads "Doug Scott".

Douglas P. Scott
Director

EXECUTIVE SUMMARY

Key Message: Analyses of groundwater data collected from 1990 to the present shows a statistically significant increasing trend of community water supply wells with volatile organic compound detections per year. More importantly, this data show an increasing trend of groundwater degradation.

Background

Since the inception of the Environmental Protection Act in 1970, it has been the policy of the State of Illinois to restore, protect, and enhance its groundwater as a natural and public resource. Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and it is vitally important to the general health, safety, and welfare of its citizens. Groundwater resources should be utilized for beneficial and legitimate purposes. Waste and degradation should be prevented, and groundwater resources should be managed to maximize benefits to the state.

The Illinois Groundwater Protection Act responds to groundwater management by emphasizing a prevention-oriented process that relies upon state and local partnerships. The Illinois Groundwater Protection Act establishes a unified groundwater protection policy by:

- Establishing a groundwater education program;
- Establishing water well protection zones;
- Providing for surveys, mapping, and assessments;
- Monitoring ambient groundwater quality;
- Establishing a regional groundwater protection-planning program;
- Establishing authority for recharge area protection;
- Requiring the establishment of two tiered groundwater quality standards; and
- Requiring technology control regulations.

The Illinois Groundwater Protection Act established the Interagency Coordinating Committee on Groundwater, which is comprised of various state agencies and is chaired by Illinois EPA's Director. The Interagency Coordinating Committee on Groundwater considers diverse stakeholder input from the Groundwater Advisory Council and the four priority regional groundwater protection planning committees in developing groundwater protection policies and programs.

The Groundwater Advisory Council, also established by the Illinois Groundwater Protection Act, is comprised of nine members appointed by the Governor from the following interests:

- Two representatives from industrial/commercial interests;
- Two representatives from environmental interests;
- One regional planning agency representative;
- One representative from agricultural interests;
- One public water supply representative;
- One water well drilling industry representative; and
- One local/county government representative.

Illinois EPA selected the four existing priority groundwater protection planning regions—northern, central, southern, and northeastern—to assist with establishing a regional groundwater protection planning program, as mandated in the Illinois Groundwater Protection Act. Each of the four regions has its own groundwater protection planning committee. These committees advocate groundwater protection practices and procedures to municipal, county, state, and other local units of government throughout their respective regions.

The Illinois Groundwater Protection Act requires the Interagency Coordinating Committee on Groundwater to report biennially to the Governor and General Assembly on groundwater quality and quantity, as well as the state's enforcement efforts. This is the tenth biennial report, and the previous nine reports are available on Illinois EPA's Web site at <http://www.epa.state.il.us/water/groundwater/groundwater-protection/index.html>.

The intended purpose of this 2008 Biennial Report is to:

- Provide a comprehensive status report on the implementation of the Illinois Groundwater Protection Act;
- Provide a self-assessment of program initiatives in relation to the goals and objectives of the program recommended in the 2006 Biennial Report; and
- Provide environmental and programmatic indicators to help measure and demonstrate program performance.

Volatile Organic Compound Trend Analysis

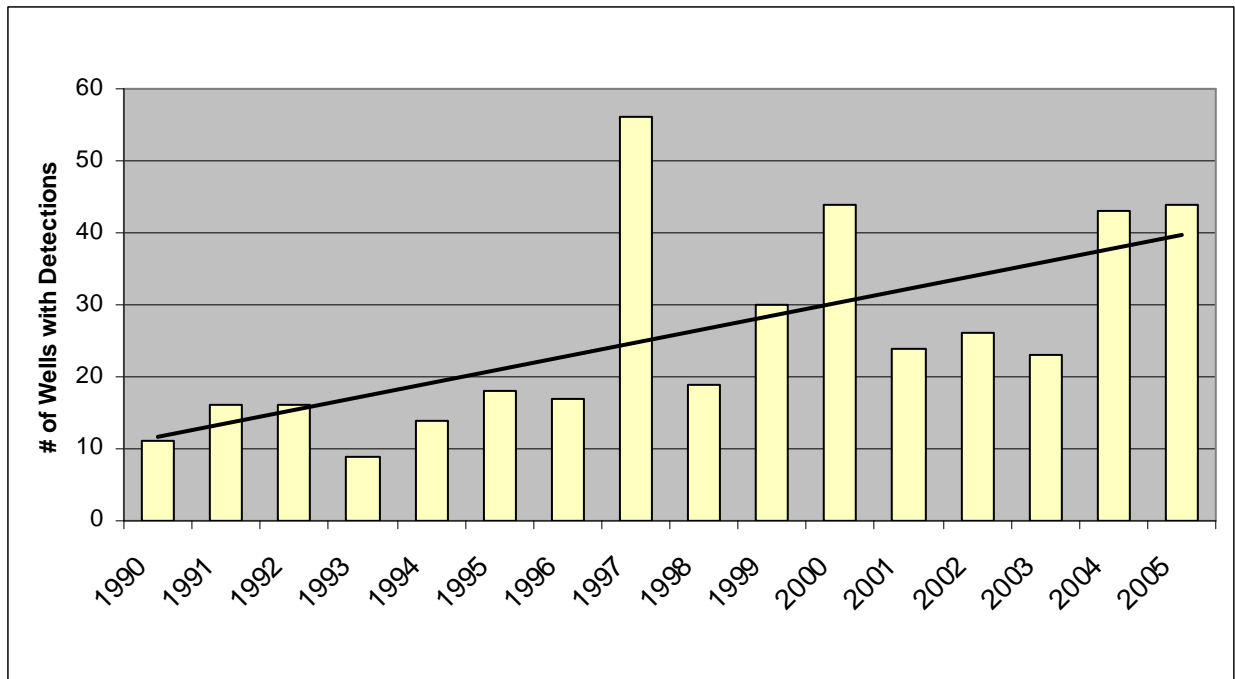
Protecting and managing groundwater are critical. Groundwater is an important natural resource that not only provides Illinois' citizens water for drinking and household uses, but also supports industrial, agricultural, and commercial activities throughout the state.

Unfortunately, industrial, agricultural, and commercial activities can often produce volatile organic compounds. They are usually produced in large volumes and are associated with products such as plastics, adhesives, paints, gasoline, fumigants, refrigerants, and dry-cleaning fluids. They can reach groundwater through many sources and routes, including leaking storage tanks, landfills, infiltration of urban runoff and wastewater, septic systems, and injection through wells. Volatile organic compounds are an important group of environmental contaminants to monitor and manage in groundwater because of their widespread and long-term use, as well as their ability to persist and migrate in groundwater.

A long-term investigation by the U.S. Geological Survey provides the most comprehensive national analysis, to date, of the occurrence of volatile organic compounds in groundwater. One of the major findings is that volatile organic compounds were detected in most aquifers throughout the nation, and were not limited to a few specific aquifers or regions.

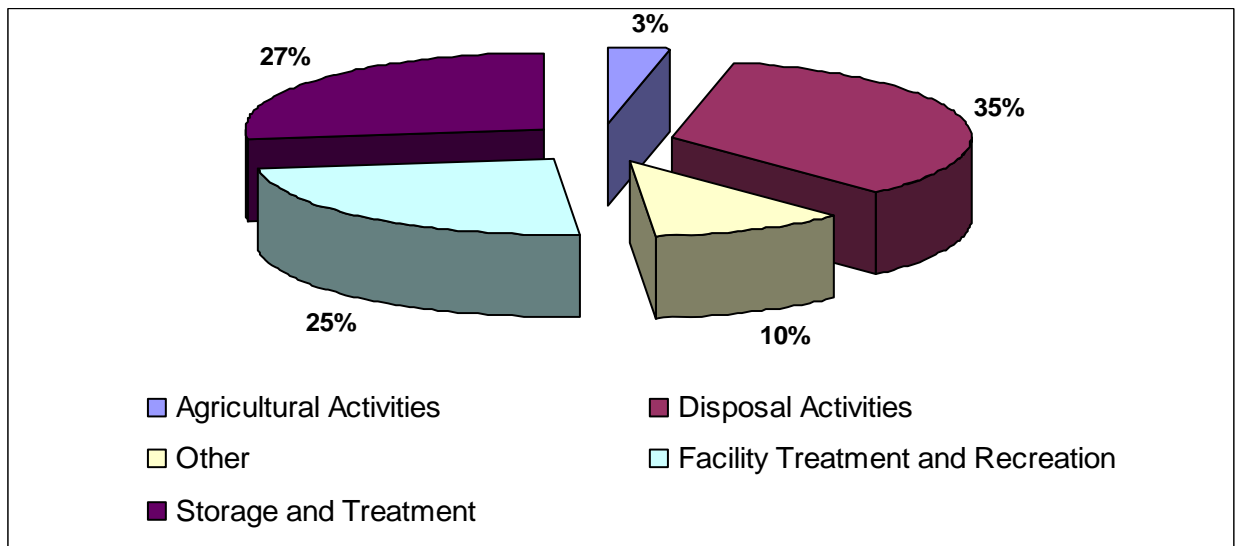
Recently, Illinois EPA used its groundwater monitoring data set (1990 to the present) to complete a volatile organic compound trend analysis. The number of wells sampled during this period declined. While year-to-year evaluation of groundwater monitoring data from community water supply wells has shown fluctuations of volatile organic compounds, analyses of this data shows a statistically increasing trend of volatile organic compound contamination in community water supply wells, as illustrated in Figure 1.

Figure 1. Increasing number of community water supply wells with volatile organic compound detections



In addition, Illinois EPA used its database of potential sources that have been inventoried as part of well site surveys, hazard reviews, groundwater protection needs assessments, source water assessments, and other special field investigations to determine the most threatening potential contamination sources associated with community water supply wells with volatile organic compound detects. The most threatening potential contamination sources are shown in Figure 2.

Figure 2. Most threatening potential contamination sources in community water supply wells with volatile organic compound detections



An additional concern is that high volatile organic compound levels may be found in nearby private drinking water wells. To that end, Illinois EPA continues to implement legislation and rulemaking that were developed and adopted in 2002. The resultant Groundwater Contamination Response Strategy sets forth procedures to be used to notify local private well owners of existing and potential groundwater contamination of private wells by volatile organic compounds detected in community water supply wells. The facility sites that were reviewed through 2007 are listed below:

- Adams County: Mill Creek
- Boone County: Belvidere
- Cass County: Beardstown
- Clark County: Union-York
- Cook County: South Chicago Heights
- DeKalb County: Sandwich
- DuPage County: Downers Grove
- Henry County: Kershaw Mobile Home Park
- Jo Daviess County: Scales Mound
- Kankakee County: Momence
- Kendall County: Plano
- Lake County: Island Lake
- Madison County: Edwardsville
- McHenry County: Crystal Lake, Fox River Grove, Harvard, Hebron
- Menard County: Petersburg
- Montgomery County: Nokomis
- Ogle County: Byron
- Peoria County: Princeville
- Pike County: Hull
- Rock Island County: Milan
- Stephenson County: Freeport
- Tazewell County: East Peoria
- Whiteside County: Morrison
- Will County: New Lenox
- Winnebago County: Loves Park, Six Oaks Mobile Home Park
- Woodford County: Roanoke

In conclusion, Illinois groundwater resources are being degraded. Degradation occurs based on the potential or actual diminishment of the beneficial use of the resource. When contaminant levels are detected or predicted to be above concentrations that cannot be removed by ordinary treatment techniques, applied by the owner of a private drinking water system well, potential or actual diminishment occurs.

The results of the groundwater data trend analysis show the importance of doing long-term monitoring such that trend analysis can be performed. More importantly, this data shows an increasing trend of groundwater degradation. Illinois EPA will continue to evaluate this groundwater monitoring data to determine the causes and potential sources of this trend.

Summary of Results

The 2008 Biennial Report provides additional detail for the tables contained in this Executive Summary. These tables provide highlights of the results based on the 2006 Biennial Report objectives, and are organized by the following chapters:

- Chapter I. Interagency Coordinating Committee on Groundwater Operations
- Chapter II. Groundwater Advisory Council Operations
- Chapter III. Education Program for Groundwater Protection
- Chapter IV. Groundwater Evaluation Program
- Chapter V. Right-to-Know Initiatives
- Chapter VI. Groundwater Quality Standards and Technology Control Regulations
- Chapter VII. Wellhead Protection Program
- Chapter VIII. Regional Groundwater Protection Planning Program
- Chapter IX. Non-Community and Private Well Program
- Chapter X. Groundwater Quality Protection Recommendations and Future Directions

CHAPTER I. INTERAGENCY COORDINATING COMMITTEE ON GROUNDWATER OPERATIONS

Key Message: Many states' groundwater protection programs are not coordinated. The Interagency Coordinating Committee on Groundwater has been active since 1988.

Objectives	Results
Assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.	A joint Interagency Coordinating Committee on Groundwater/Groundwater Advisory Council meeting was held to obtain input on draft revisions to the Illinois Pollution Control Board's groundwater standards. Joint meeting presentations provided updates from the Illinois Department of Natural Resources on water planning quantity initiatives.
Initiate a policy discussion regarding prevention versus remediation.	The Interagency Coordinating Committee on Groundwater, Groundwater Advisory Council, and regional planning committees held a dialogue discussion with U.S. EPA Region 5 and other state groundwater managers. The policy discussion was published on a CD and is available from Illinois EPA.
Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives. The Site Remediation Advisory Committee recommended that the problem be documented and that the wellhead protection area modeling process be peer reviewed.	The Interagency Coordinating Committee on Groundwater developed a strategy to respond to the two Site Remediation Advisory Committee recommendations. First, a paper was submitted to the National Ground Water Association that documented the increasing trend of volatile organic compounds occurring in community water supply wells. Secondly, Illinois' wellhead protection area definition and modeling process was codified under Illinois Pollution Control Board regulations. Furthermore, a national dialog with other states was sponsored by the Ground Water Protection Council. This dialog determined that most states recognize wellhead protection areas in risk-based remediation programs.
Continue to enhance coordination between Illinois EPA's Bureau of Water and Bureau of Land remediation programs.	Illinois EPA continues to implement the Groundwater Contamination Response Strategy to existing and potential groundwater contamination of private wells by volatile organic compounds. To date, notification was provided to 30 sites and Illinois EPA follow-up investigations are being

**INTERAGENCY COORDINATING COMMITTEE ON
GROUNDWATER OPERATIONS (cont'd)**

Objectives	Results
Continue to review and update the Implementation Plan and Regulatory Agenda.	The Interagency Coordinating Committee on Groundwater provided input on four regulations/rules that were proposed to the Illinois Pollution Control Board during this two-year period. The Right-to-Know community relations and well survey regulations were adopted by the Illinois Pollution Control Board, and cost recovery rules were adopted by the Joint Committee on Administrative Rules. Radionuclide release reporting regulations were proposed to the Illinois Pollution Control Board, which adopted First Notice for these regulations on December 6, 2007. In addition, proposed revisions to the groundwater quality standards were developed, and multiple stakeholder outreach meetings were held.
Work with the Groundwater Advisory Council and regional the regional groundwater protection and planning committees to sponsor a Groundwater Protection Policy Forum.	This objective was not accomplished; however, planning for a Groundwater Protection Policy Forum to be held in 2008 has been implemented.
Continue to hold quarterly meetings.	This objective was not accomplished.
Provide liaison for the Groundwater Advisory Council.	Meetings of the Interagency Coordinating Committee on Groundwater were held jointly with the Groundwater Advisory Council.

**INTERAGENCY COORDINATING COMMITTEE ON
GROUNDWATER OPERATIONS (cont'd)**

Objectives	Results
Enhance Web-based educational materials.	<p>Illinois EPA's Web site, http://www.epa.state.il.us/water/groundwater/index.html, was enhanced to provide additional information on the Interagency Coordinating Committee on Groundwater, including nine previously-published Illinois Groundwater Protection Act Biennial Reports, various educational materials, and a contact directory.</p> <p>The Illinois State Water Survey created a new Web page devoted to domestic wells, http://www.sws.uiuc.edu/gws/domesticwell.asp. A Web page, http://www.sws.uiuc.edu/wsp/watersupply.asp, was created for water supply planning and current activities pursuant to Executive Order #1-2006, "Executive Order for the Development of State and Regional Water-Supply Plans."</p> <p>The Illinois State Geological Survey updated its hydrogeology Web site, http://www.isgs.uiuc.edu/research/hydrogeology.shtml, to include current projects, feature articles, related links, and the "2007 Three-Dimensional Geological Mapping for Groundwater Applications" workshop. The Illinois State Geological Survey's educational outreach Web site, http://www.isgs.uiuc.edu/education/education.shtml, includes links related to groundwater and a variety of other geologic topics, teacher resources, and materials that can be downloaded for free.</p>
Assist in implementation of the <i>Illinois Generic Management Plan for Pesticides in Groundwater</i> .	The Interagency Coordinating Committee on Groundwater provided input to a revised plan that was submitted to, and approved by, U.S. EPA.
Evaluate the development of Class III: Special Resource Groundwater for Dedicated Nature Preserves.	No requests were submitted for review.
Review regulated recharge area proposals.	No proposals were submitted for review.

CHAPTER II. GROUNDWATER ADVISORY COUNCIL OPERATIONS

Key Message: Stakeholder input is a key to implementation of effective groundwater protection programs.

Objectives	Results
Review and make recommendations regarding groundwater issues and policies.	<p>Under the leadership of Illinois Department of Natural Resources, the Groundwater Advisory Council participated in discussions for implementing Executive Order #1-2006, “Executive Order for the Development of State and Regional Water Supply Plans.”</p> <p>The Groundwater Advisory Council established a special Right-to-Know Notification Subcommittee that developed a resolution on the methods of providing notice as required under Section 25d-3 of Public Act 94-314. This resolution may be found on Illinois EPA’s Right-to-Know Web page at http://www.epa.state.il.us/community-relations/right-to-know/index.html.</p>
Conduct policy-related meetings.	The Groundwater Advisory Council held three meetings to discuss water quality and quantity initiatives.
Provide input to programs, plans, regulatory proposals, and reports, as appropriate.	The Groundwater Advisory Council focused on providing input to the four regulations that were developed during this two-year period. Two have already been adopted; a third is at First Notice. Further, the Groundwater Advisory Council Right-to-Know Notification Subcommittee developed a resolution that satisfied the Right-to-Know law requirements. The Groundwater Advisory Council sponsored special stakeholder outreach meetings for the regulations that were developed.

CHAPTER III. EDUCATION PROGRAM FOR GROUNDWATER PROTECTION

Key Message: Illinois EPA staff shortages and cuts to the groundwater education program at Illinois Department of Natural Resources have made it difficult to support local efforts to protect groundwater as required under the Illinois Environmental Protection Act.

Objectives	Results
Continue to develop and improve the Web-based information ordering and distribution system.	<p>The Illinois Department of Natural Resources Web site offers a number of educational resources for teachers and kids at http://www.dnr.state.il.us/lands/education/index.htm.</p> <p>The Illinois State Water Survey has scanned all historical water survey reports and placed them online at http://www.sws.uiuc.edu/pubs/isearch.asp.</p> <p>The Illinois State Geological Survey has enhanced its Web site for distributing maps and data related to groundwater and other geologic topics, for online publications, and for ordering maps and publications at http://www.isgs.uiuc.edu/maps-data-pub/maps.html. A Web-based ordering and distribution system is being implemented.</p>
Integrate groundwater education efforts into other state environmental planning and protection programs.	The Governor's state water supply planning initiative, pursuant to Executive Order #1-2006, called for the creation of two regional stakeholder planning committees. A water supply planning Web page has been developed to provide a variety of information to users, especially the stakeholder planning committees. This information may be found at http://www.sws.uiuc.edu/wsp/ .
Work toward enhancing the groundwater protection education resources on a priority basis.	The Illinois State Water Survey and the Illinois State Geological Survey continue to provide groundwater education services to teachers, students, and all sectors of the public.

CHAPTER IV. GROUNDWATER EVALUATION PROGRAM

Key Message: Change occurs as a result of leadership and cooperation. Kane County and McHenry County are champions of change.

Objectives	Results
Evaluate causes and potential sources of increasing volatile organic compound trend.	Illinois EPA has evaluated the inventoried potential contamination sources' data from well site surveys and determined the most statistically threatening potential contamination sources. Additionally, Illinois EPA's Bureau of Land Site Remediation Referral Group has been doing additional field work to determine sources of contamination. National dialog was also initiated with other states and U.S. EPA at the annual Ground Water Protection Council conference.
Work toward supporting the Illinois Water Inventory Program.	The Illinois Water Inventory Program is being supported by the Illinois State Water Survey through the state water supply planning initiative, pursuant to Executive Order #01-2006.
Continue to improve the source water assessment and protection system geographic information system to include more interactive features.	A database development contract was completed to enhance the source water assessment and protection system geographic information system database, referred to as Proteus.
Continue to share geographic information system coverages in an electronic format and continue to automate the groundwater resource database for Illinois.	Illinois EPA continued to update the source water assessment and protection Internet geographic information system, in conjunction with Illinois Department of Natural Resources, Illinois State Water Survey, Illinois State Geological Survey, and U.S. Geological Survey. In 2006, nearly 140,000 visitors accessed over two-million Illinois Natural Resources Geospatial Data Clearinghouse Web pages. A Web search on the keywords "Illinois" and "GIS" offers the Illinois Clearinghouse as the first Web site returned at Google, Yahoo, AOL, and Ask.com. A project to enable access to 2005 digital orthoimagery collections prompted requests from Google, Mapquest, Microsoft Earth, Navteq, the Nature Conservancy, the National Weather Service, and FutureGen partner agency representatives.

GROUNDWATER EVALUATION PROGRAM (cont'd)

Objectives	Results
<p>Continue to conduct groundwater assessments and share the information through regular updates and completed reports.</p>	<p>The Illinois State Geological Survey ILWATER Web site provides Internet access to more than 275,000 water-well and other borehole records along with an extensive database of geological information. Approximately 2,400 visitors per month accessed the website during 2007. Groundwater assessments continued in northeastern Illinois, Metro East St. Louis, and the Mahomet Aquifer region.</p> <p>The Midwest Technology Assistance Center sponsored adequacy assessments for 12 small communities in 2006 and for 24 in 2007. Midwest Technology Assistance Center also sponsored research on drought planning for small communities in the Midwest. Information for both of these topics may be found on the Midwest Technology Assistance Center Web site at <i>http://mtac.sws.uiuc.edu</i>.</p> <p>Many activities are conducted in cooperation with the Illinois State Geological Survey, including assessment of groundwater quality for arsenic, radium and nutrients, as well as groundwater recharge assessment, groundwater modeling, and nature preserve protection activities.</p> <p>Kane County's effort to comprehensively assess the geologic and groundwater resources and to integrate water resources into county-wide planning is a role model for the state. McHenry County built on their assessments by hiring a groundwater coordinator, who continues to move toward implementation of planning efforts.</p>
<p>Continue to utilize innovative and cost-effective methods to implement statewide groundwater quality monitoring.</p>	<p>DuPage County implemented a model effort county-wide assessment of private drinking water system wells using a random selection process. As a result of this effort, private wells contaminated with volatile organic compounds were discovered and connected to the municipal water supply.</p>
<p>Continue to assess and evaluate emerging contaminants of concern.</p>	<p>Illinois Department of Agriculture has continued to assess pesticide transformation products in its dedicated monitoring well network. Further, U.S. Geological Survey has also monitored for emerging compounds (e.g., pharmaceuticals) in groundwater in Illinois under the National Water Quality Assessment program.</p>

GROUNDWATER EVALUATION PROGRAM (cont'd)	
Objectives	Results
Continue to implement and improve overall groundwater quality indicators.	Illinois EPA has improved the overall indicators by conducting the first long-term trend analysis of volatile organic compounds in community water supply wells.

CHAPTER V. RIGHT-TO-KNOW INITIATIVES

Key Message: Prevention results from a change in behavior. Before a change in behavior can occur there must first be awareness.

Objectives	Results
Obtain input from the Groundwater Advisory Council on notice methods and associated rules.	This was accomplished, as described in Chapter II, Groundwater Advisory Council Operations.
Continue to issue community water supply well-centric (triggered by detections in public water supply wells) notices in coordination with Illinois Department of Public Health.	Fourteen well-centric notifications were sent out during this reporting period.
Implement the evaluation and notification requirements under the Right-to-Know law.	The notifications provided are listed under the Right-to-Know Web page at http://www.epa.state.il.us/right-to-know/ .
Assist in the development and proposal of Right-to-Know cost recovery, well survey, and community relations work plan rules.	The Illinois Pollution Control Board and Joint Committee on Administrative Rules adopted the final regulations and rules on September 29, 2006, and October 23, 2007, respectively.
Assist with training both Illinois Department of Public Health and local health departments on Right-to-Know and use of the Internet geographic information system.	Illinois EPA conducted training sessions at the Kane County and Winnebago County Health Departments. Illinois EPA also developed a Right-to-Know and Internet geographic information system training CD that was distributed to local and regional health departments through Illinois Department of Public Health. The Illinois Environmental Regulatory Group also sponsored two successful Right-to-Know workshops for business representatives and consultants, in cooperation with Illinois EPA staff.

CHAPTER VI. GROUNDWATER QUALITY STANDARDS AND TECHNOLOGY CONTROL REGULATIONS

Key Message: Groundwater standards protect not only public health, but also the beneficial uses of the resource. Nondegradation of beneficial uses occurs when groundwater contaminants cannot be removed by ordinary treatment techniques employed by a private drinking water system owner.

Objectives	Results
Evaluate the need to develop Class III: Special Resource Groundwater Standards.	No new scientific basis has been developed to support new standards specific to Class III groundwater.
Continue to: (1) develop proposed groundwater quality standards for emerging contaminants of concern and contaminants detected in groundwater; (2) implement and integrate the groundwater quality standards into environmental programs; and (3) update and amend groundwater standards to parallel the drinking water standards adopted by U.S. EPA.	Illinois EPA evaluated groundwater data for approximately 300 groundwater parameters. The data set evaluated spanned from April 1984 to April 2004. Illinois EPA has also evaluated confirmed groundwater contaminants at various cleanup sites. Illinois EPA is proposing a groundwater standard for perchlorate. Illinois EPA is proposing an amendment to the existing groundwater standard for arsenic, based on the revised federal drinking water standard.
Continue to implement preventive notice and response programs, and integrate with environmental programs.	Significant public concern and national response to tritium leaks from nuclear power plants led to new radionuclide release reporting legislation and enforcement efforts focused on the protection of threatened beneficial uses. New release reporting regulations have also been developed and proposed to the Illinois Pollution Control Board.
Continue to implement the technology control regulations and improve a database for tracking and evaluating compliance data.	The Proteus database project assists with meeting this objective.

CHAPTER VII. WELLHEAD PROTECTION PROGRAM

Key Message: Source water protection provides a multi-barrier approach to protecting drinking water. A multi-barrier approach is essential given the emerging contaminants (viruses, pharmaceuticals, endocrine disruptors, herbicide transformation products) that may not be removed by treatment.

Objectives	Results
Continue the discussion with the Groundwater Advisory Council and other stakeholders regarding the integration of wellhead protection areas as a factor in the Tiered Approach to Corrective Action.	Efforts have focused on responding to two Site Remediation Advisory Committee recommendations—that problems be documented and that the wellhead protection area modeling process be peer reviewed.
Develop new Illinois EPA source water protection criteria and regulations.	Draft regulatory revisions were prepared, but are still under development. The American Water Works Association adopted a new source water protection standard. Illinois EPA is coordinating with the Illinois Section of the American Water Works Association on the best way to promote this new standard.
Continue integration of Illinois EPA’s Groundwater and Field Operations Sections’ programs for technical assistance in source water protection and engineering evaluations (sanitary surveys).	A new database that integrates completed electronic engineering evaluations as a strategy for updating source water assessments has been developed, but not fully implemented. Illinois EPA’s Groundwater Section staff is being cross-trained to conduct source assessments and sanitary surveys.
Continue to publish wellhead protection and assessment data at http://www.epa.state.il.us/water/groundwater/source-water-quality-program.html .	Source water assessments have been conducted and/or revised for 37 community water supplies and 260 non-community water supplies. Moreover, work is under way on 30 additional non-community water supplies.
Increase the percentage of intensive groundwater protection management for community water supply wells.	Groundwater protection management has not substantially increased within delineated wellhead protection areas during this two-year period.

WELLHEAD PROTECTION PROGRAM (cont'd)	
Objectives	Results
Continue integration and implementation of the Wellhead Protection Program under the Safe Drinking Water Act's alternative monitoring program.	A total of 561 community water supplies have implemented local wellhead protection program elements and met the requirements for obtaining a full or partial Safe Drinking Water Act monitoring waiver for volatile organic compounds and synthetic organic compounds. This total includes 671 treatment application points with a full monitoring waiver and another 103 treatment application points with a volatile organic compound-only or synthetic organic compound-only Safe Drinking Water Act monitoring waiver.
Continue the delineation of recharge areas for community water supplies using reasonably available information.	Delineation was completed for five new community water supplies, and 23 community water supply wellhead protection area delineations were updated.
Continue to modify community water supply well construction permit application procedures to include collection of information on potential sources and routes, well logs, pumping tests, and chemical analyses.	Draft revisions to the application forms and regulations were developed, but have not been finalized.
Evaluate efforts to expand the Illinois Water Well Decommissioning Program.	The Illinois Water Well Decommissioning Program has been expanded to allow ten well sealing projects in each local soil and water conservation district and to permit the sealing of abandoned irrigation wells. In addition, a special projects category has been adopted through the Conservation 2000 Program for funding high
Promote the new Source Water Protection Plan Guidance.	An interactive CD entitled "Guide to Developing a Source Water Protection Program in Illinois" was developed with assistance from the Montana Water Center, through a grant from the Midwest Technology Assistance Center. The CD has been demonstrated at several professional water supply conferences and workshops, including those of the American Water Works Association-Illinois Section, Illinois Potable Water Supply Operators Association, and the Illinois Rural Water Association. Water supply operators completing the guidance portion of the CD can earn up to 7.5 renewal education credit hours. In addition, the source water protection CD is posted on Illinois EPA's Web site.

CHAPTER VIII. REGIONAL GROUNDWATER PROTECTION PLANNING PROGRAM

Key Message: A public educated about groundwater will protect groundwater. The regional groundwater protection planning committees continue to implement programs and assist with targeting local contacts and interest groups to advocate groundwater protection practices and procedures. However, these programs are very time consuming and significant staff resources and funding is needed to maintain these programs.

Objectives	Results
Maintain current committee flexibility and assist with conducting and supporting both new initiatives and follow-up efforts for local and regional groundwater protection programs.	<p>Illinois EPA’s Groundwater Section continues to coordinate with the regional groundwater protection planning committees to implement programs and assist with targeting local contacts and interest groups. These efforts advocate groundwater protection practices and procedures to municipal, county, state, and other local units of government throughout their respective regions.</p> <p>During the past two years, Illinois EPA and members of the four regional groundwater protection planning committees have met with local stakeholders to encourage the development of groundwater protection programs, goals, and objectives to implement activities to protect community water supply recharge areas. These goals and objectives are useful in prioritizing and developing groundwater protection programs such as annual fields days, workshops, well-sealing demonstrations, and promoting and participating in the national Groundwater Guardian Program.</p>

CHAPTER IX. NON-COMMUNITY AND PRIVATE WELL PROGRAM

Key Message: Volatile organic compounds were detected in about half of the 2,401 domestic drinking water wells in a recent U.S. Geological Survey study. This finding shows the wells are more vulnerable to low-level contamination by volatile organic compounds than previously thought, according to U.S. Geological Survey scientists.

Objectives	Results
Continue to implement the Wellhead Protection Program and assist with implementing the technology control and groundwater quality standards regulations.	At the time of inspection of non-community water supplies, Illinois Department of Public Health and local health departments inspect the area surrounding the wellhead for potential sources of contamination.
Continue the source water assessments for new non-community water supplies.	Work has begun on the source water assessments for 168 non-community water supplies that have become active since January 1, 2006.
Continue geographic information system coverage for all new non-community public water systems.	Digitizing the locations of all existing non-community public water supply wells has been completed. The process of digitizing the locations of all new non-community public water supply wells will continue.
Continue certification training of non-transient non-community water supplies operators.	Training, certification, and recertification of operators is ongoing. As of July 2007, 472 operators are currently certified to operate the 382 active non-transient non-community water supplies.
Continue to inspect and perform laboratory analyses on water samples collected from non-community water supplies.	Inspections continue to be performed at least once every two years. All non-community public water supplies continue to be sampled at least yearly for coliform bacteria and nitrates. Non-transient non-community water supplies continue to be sampled for volatile organic compounds, synthetic organic compounds, and inorganic chemicals, based on the requirements of the Safe Drinking Water Act.
Continue to issue permits for the construction, modification, or extension of existing non-community water supplies.	During 2006 and 2007, Illinois Department of Public Health issued approximately 140 permits for the construction, modification, or an extension of an existing non-community water supply.
Continue the issuance of permits for all types of water wells with the exception of community water supply wells.	During 2006 and 2007, Illinois Department of Public Health and local health departments issued approximately 11,973 water well construction permits.

NON-COMMUNITY AND PRIVATE WELL PROGRAM (cont'd)	
Objectives	Results
Continue to update the Illinois Water Well Construction and Pump Installation Codes to reflect new technology, industry, and public health standards.	Illinois Department of Public Health has proposed amendments to the Illinois Water Well Construction and Pump Installation Codes.
Continue supporting education training sessions for licensed water well and pump installation contractors.	During 2006 and 2007, the Illinois Association of Groundwater Professionals presented nine, six-hour continuing education sessions.
Continue to conduct training sessions pertaining to both the non-community water supplies and private water programs for local health department and Illinois Department of Public Health water program staff.	During 2006 and 2007, Illinois Department of Public Health and the Illinois Environmental Health Association presented 17 training sessions for water program staff from Illinois Department of Public Health and 96 local health departments.
Continue implementation of public notification for private water supply potential contamination.	From July of 2002 through October of 2007, Illinois Department of Public Health and local health departments processed 38 public notices of the owners of any private, semi-private, or non-community public water supply wells within potentially affected areas of concern.
Continue conversion of the Illinois Department of Public Health database onto the Safe Drinking Water Information System.	Inventory, sampling and violation data continues to be entered into the Safe Drinking Water Information System. In addition, compliance with Safe Drinking Water Act requirements is now being determined using Safe Drinking Water Information System.

CHAPTER X. GROUNDWATER QUALITY PROTECTION RECOMMENDATIONS AND FUTURE DIRECTIONS

The following recommendations are based on the results in the above tables. These appear in Chapter X, Groundwater Quality Protection Recommendations and Future Directions, in the main body of the 2008 Biennial Report.

Interagency Coordinating Committee on Groundwater Operations

- Continue to review and update the Implementation Plan and Regulatory Agenda.
- Work with the Groundwater Advisory Council and regional groundwater protection committees to sponsor a Groundwater Protection Policy Forum.
- Assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.
- Continue the policy discussion regarding prevention versus remediation.
- Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives. The Site Remediation Advisory Committee recommended that the problem be documented and that the wellhead protection area modeling process be peer reviewed.
- Establish a subcommittee led by Illinois Department of Public Health to discuss tracking and registering groundwater monitoring wells.
- Establish a subcommittee to discuss registering closed-loop heat pump wells and licensing drillers.

Groundwater Advisory Council Operations

- Review and make recommendations regarding groundwater issues and policies.
- Provide input to programs, plans, regulatory proposals, and reports as appropriate.

Education Program for Groundwater Protection

- Market the new source water protection standards.
- Initiate efforts to fill critical staff vacancies.

Groundwater Evaluation Program

- Continue to conduct a program of basic and applied groundwater research programs that allow decisions to be made on sound scientific principles.
- Strive to implement monitoring for emerging contaminants.

Right-to-Know Initiatives

- Continue efforts of providing notification for off-site potable resource groundwater users threatened by degradation of the groundwater's beneficial uses.

Groundwater Quality Standards and Technology Control Regulations

- Continue with proposed changes to the groundwater quality standards and continue efforts of protecting future beneficial uses of drinking water.

Wellhead Protection Program

- Amend rules to require the development of source water protection planning (unless already developed) considering the current state of the art.
- Implement principles developed under the national Source Water Protection Collaborative (e.g., “Marketing for Change”) as part of outreach efforts.

Regional Groundwater Protection Planning Program

- Continue to assist and advocate local groundwater protection, education, and marketing.

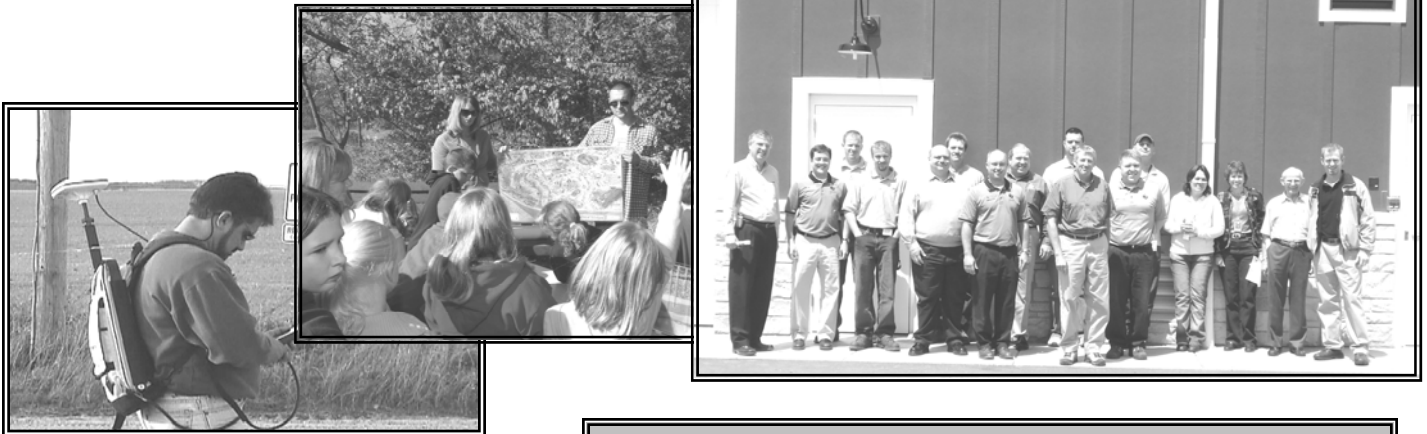
Non-Community and Private Well Program

- Continue to implement the Wellhead Protection Program, and assist with implementing the technology control and groundwater quality standards regulations.
- Continue the source water assessments for new non-community public water supplies.
- Continue certification training of non-transient, non-community public water supply operators.
- Continue to inspect and perform laboratory analyses on water samples collected from non-community public water supplies.
- Continue to issue permits for the construction, modification or extension of existing non-community public water supplies.
- Continue the issuance of permits for all types of water wells with the exception of public water supply wells.
- Continue to update the Illinois Water Well and Pump Installation Codes to reflect new technology, industry, and public health standards.
- Continue supporting education training sessions for licensed water well and pump installation contractors.
- Continue to conduct training sessions pertaining to both the non-community public water supply and private-water program for local health departments and Illinois Department of Public Health.
- Continue to completely implement the Safe Drinking Water Information System database for compliance monitoring of non-community public water supplies.
- Continue the implementation of public notification for private water supply potential contamination.



Illinois Groundwater Protection Program

Biennial Comprehensive Status and Self-Assessment Report



The State of Illinois recognizes the essential and pervasive role of groundwater in the social and economic well-being of the state, and its vital importance to the general health, safety, and welfare of its citizens.

--Illinois Groundwater Protection Act



*Prepared by the
Interagency Coordinating Committee on Groundwater*



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ACRONYM GLOSSARY

Act	Illinois Environmental Protection Act
Ambient Network	Ambient Groundwater Monitoring Network
Board	Illinois Pollution Control Board
BOL	Bureau of Land
BOW	Bureau of Water
Clearinghouse	Illinois Natural Resources Geospatial Data Clearinghouse
CMAP	Chicago Metropolitan Agency for Planning
CWS	Community Water Supply
DNR	Department of Natural Resources
GAC	Groundwater Advisory Council
GIS	Geographic Information System
GWPC	Ground Water Protection Council
IAGP	Illinois Association of Groundwater Professionals
ICCG	Interagency Coordinating Committee on Groundwater
IDA	Illinois Department of Agriculture
IDPH	Illinois Department of Public Health
IGPA	Illinois Groundwater Protection Act
Illinois EPA	Illinois Environmental Protection Agency
ILWATER	Illinois Water and Related Wells
IOC	Inorganic Chemical
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
IWIP	Illinois Water Inventory Program
JCAR	Joint Committee on Administrative Rules
LEHP	Licensed Environmental Health Practitioner
LIRB	Lower Illinois River Basin
MAC	Mahomet Aquifer Consortium
MCL	Maximum Contaminant Level
mg/l	Milligrams per Liter
NAWQA	National Water Quality Assessment
NCPWS	Non-Community Public Water System
NGWA	National Ground Water Association
ppb	Parts per Billion
RTK	Right-to-Know
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SOC	Synthetic Organic Compound
SRAC	Site Remediation Advisory Committee
SWAP	Source Water Assessment and Protection
TACO	Tiered Approach for Corrective Action Objectives
UIRB	Upper Illinois River Basins
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Program
ug/l	Micrograms per Liter

**CHAPTER I. INTERAGENCY COORDINATING COMMITTEE ON
GROUNDWATER OPERATIONS**

The Illinois Groundwater Protection Act (IGPA) required the creation of the Interagency Coordinating Committee on Groundwater (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, the state enforcement efforts for protection of the groundwater, and make recommendations in improving the state’s efforts to protect the groundwater;
- Recommending procedures for better coordination among state groundwater programs and 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 ICCG is chaired by the Director of Illinois Environmental Protection Agency (Illinois EPA) and is comprised of members from ten state agencies/departments that have some jurisdiction over groundwater (Table 1). The ICCG continues to review and update an Implementation Plan and Regulatory Agenda pursuant to the IGPA. Detailed minutes are taken at every meeting and are available from Illinois EPA.

Table 1. Members of the Interagency Coordinating Committee on Groundwater

Environmental Protection Agency (Chair)	Marcia Willhite, designee
Department of Natural Resources	Todd Rettig, designee
Office of Water Resources	Gary Clark, designee
Office of Mines and Minerals	Scott Fowler, designee
Department of Public Health	Jerry Dalsin, designee
Office of the State Fire Marshal	Shelly Bradley, designee
Department of Agriculture	Dennis McKenna, designee
Emergency Management Agency, Division of Nuclear Safety	Gary McCandless, designee
Department of Commerce and Economic Opportunity	John Knittle, designee
<i>Also attending the ICCG meetings are: Steve Gobelman, Illinois Department of Transportation’s Division of Highways; Allen Wehrmann, Illinois State Water Survey; David Larson, Illinois State Geological Survey; and George Groschen, United States Geological Survey.</i>	

Section 1. Assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.

Joint ICCG/Groundwater Advisory Council (GAC) and regional planning committee chair meetings were held to obtain input on draft revisions to the Illinois Pollution Control Board (Board) groundwater standards and radionuclide reporting regulations. Further, input was sought

on revisions to *Illinois Generic Management Plan for Pesticides in Groundwater*. Joint meeting presentations provided updates from Department of Natural Resources (DNR) to the GAC on water planning quantity initiatives.

At the joint ICCG/GAC meeting on September 26, 2007, DNR provided an update on the efforts of implementing Executive Order #1-2006, "Executive Order for the Development of State and Regional Water Supply Plans." The Executive Order encourages the creation of locally-based regional water supply planning committees. Two locally-based regional water supply planning committees were established under the direction of the Chicago Metropolitan Agency for Planning (CMAP) and the Mahomet Aquifer Consortium (MAC). The plans developed will consider how to meet water demands through the year 2050. Challenges from the regional planning aspect include: understanding of water resource development, meeting needs of growth, agreement on the problem, managing large single-purpose users such as industry and livestock, and domestic well impacts. Once these reports are developed, the GAC will be given an opportunity to provide input.

Section 2. Initiate a policy discussion regarding prevention versus remediation.

Illinois' Environmental Protection Act (Act) and Board regulations have always had the foresight of protecting the full measure of the beneficial uses of water resources. Nondegradation prohibitions are directed toward an early alert to, and staving off of, any increase in contamination in the sensitive groundwater/potential source situations. These provisions prohibit degrading groundwater up to the standard. In other words, the Act and Board regulations prohibit a person from causing, threatening, or allowing contamination of potable resource groundwater above what is not removed by ordinary treatment processes in a private drinking water system well.

The concept of remediation deals with cleaning up contamination after it exceeds a numerical standard. Remediation takes into account the technical feasibility and economical reasonableness of cleaning up groundwater. Depending on the contaminant and the concentration of the contaminant, it may not be feasible to restore the full beneficial use of the groundwater. The groundwater management zone provisions of the Board's groundwater quality standards recognized these constraints, but the protection of the full measure of off-site beneficial uses was always assured. Further in 1997, the Board promulgated the Tiered Approach of Corrective Objectives (TACO) to implement the concepts of risk-based remediation. Risk-based objectives require that cleanup achieves meeting the groundwater standard at the nearest potable well's setback zone. Setback zones are a form of management within a wellhead protection area (WHPA) of a potable water supply. Private, semi-private, and non-community drinking water system wells have a 200-foot setback zone. Community water supply (CWS) wells have either a 200- or 400-foot minimum setback zone, or a 1,000-foot maximum setback zone.

The representatives from the ICCG, GAC, and priority groundwater protection planning regions participated in a two-day United States Environmental Protection Agency (U.S. EPA) Region 5 State Wellhead/Source Water Managers' Meeting held in Peoria, Illinois, on August 15, 16, and 17, 2007. This meeting provided for a discussion with other states and U.S. EPA Region 5 on the topic of prevention versus remediation. This meeting provided a dialog for other states in Region 5 to weigh in on this topic. A CD was developed by Illinois EPA that contains the proceedings of this meeting. This CD can be obtained from Illinois EPA.

Section 3. Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives.

The representatives from the ICCG and GAC recommended to the Site Remediation Advisory Committee (SRAC) that cleanups would be more proactive if the delineated WHPA of a CWS well was used as a point of compliance versus the setback zone under TACO. The WHPA represents the area of current and future potable resource groundwater supplying a drinking water well. SRAC did not agree with this proposed amendment and recommended that any problem be documented and that the WHPA modeling process be peer reviewed.

A strategy to respond to the two recommendations from SRAC was developed and implemented. First, a paper was prepared and submitted to the National Ground Water Association (NGWA) documenting the increasing trend of volatile organic compounds (VOCs) occurring in CWS wells. Secondly, Illinois’ WHPA definition and modeling process was codified under Board regulations. Furthermore, a national dialog with other states was sponsored by the Ground Water Protection Council (GWPC) in September of 2007. Most of the states polled use WHPAs in their risk-based remediation programs.

Section 4. Continue to enhance coordination between Illinois EPA’s Bureau of Water and Bureau of Land remediation programs.

A Groundwater Contamination Response Strategy and legislation (Public Act 92-652, effective July 11, 2002) were developed and adopted that set forth procedures to be used by state agencies in their responses to existing and potential groundwater contamination of private wells by VOCs. This strategy and legislation, which was codified at 415 ILCS 55/9.1, were developed to notify private well owners about potential groundwater problems of nearby CWS wells with VOC detections. Illinois EPA’s Bureau of Water (BOW) and Bureau of Land (BOL) continue to implement this strategy. Table 2 lists the sites where notification has been provided and follow-up Illinois EPA investigations are being conducted. (The term investigation used in Table 2 primarily relates to field reconnaissance or windshield surveys.)

Table 2. Well-centric notifications triggered by detections in community water supply wells and follow-up Illinois EPA investigations

Facility Name	County	Illinois EPA Status
Beardstown	Cass	BOL overseeing work by responsible parties.
Belvidere	Boone	Illinois EPA pursuing U.S. EPA Region 5 for investigation of the entire city.
Byron	Ogle	Illinois EPA no further action.
Crystal Lake	McHenry	BOL conducted investigation.
Downers Grove	DuPage	BOL overseeing remediation by responsible parties.
East Peoria	Tazewell	BOL investigating possible sources.
Edwardsville	Madison	BOL to sample wells, if viable.
Fox River Grove	McHenry	BOL investigating possible sources.
Freeport	Stephenson	BOL investigating possible sources.
Harvard	McHenry	Illinois EPA no further action. IDPH private well sampling found no detections.
Hebron	McHenry	BOL conducted investigation.
Hull	Pike	No further action by Illinois EPA at this time.

Facility Name	County	Illinois EPA Status
Island Lake	Lake	BOW assisting with determining groundwater flow directions.
Kershaw Mobile Home Park	Henry	BOL investigating possible sources.
Loves Park	Winnebago	BOL conducting investigation.
Milan	Rock Island	No further action by Illinois EPA at this time.
Mill Creek	Adams	No further action by Illinois EPA at this time.
Momence	Kankakee	BOL investigating possible sources. BOW contacted County Health regarding sampling private wells.
Morrison	Whiteside	BOL overseeing investigation by responsible parties.
New Lenox	Will	No further action by Illinois EPA at this time.
Nokomis	Montgomery	BOL completed investigation.
Petersburg	Menard	BOW sampled public well.
Plano	Kendall	BOW sampled public well.
Princeville	Peoria	No further action by Illinois EPA at this time.
Roanoke	Woodford	BOL conducted an investigation.
Sandwich	DeKalb	BOL conducted an investigation.
Scales Mound	Jo Davies	No further action by Illinois EPA at this time.
Six Oaks Mobile Home Park	Winnebago	No further action by Illinois EPA. IDPH sent letters regarding 1998 sampling. BOW overseeing Consent Order.
South Chicago Heights	Cook	No further action by Illinois EPA at this time.
Union-York	Clark	BOW contacted the county health department regarding sampling private wells. The county decided not to sample private wells.

Section 5. Continue to review and update the Implementation Plan and Regulatory Agenda.

The ICCG provided comments and input on several rules and regulations that were proposed to the Board during this two-year reporting period. The Right-to-Know (RTK) community relations and well survey regulations were adopted by the Board on September 29, 2006. Cost recovery rules related to the RTK laws were adopted by the Joint Committee on Administrative Rules (JCAR) on October 23, 2007. Another significant public concern related to tritium leaks from nuclear power plants led to new radionuclide release reporting legislation and enforcement efforts focused on the protection of groundwater. New tritium-release reporting regulations have been developed and proposed to the Board, which adopted First Notice for these regulations on December 6, 2007. In addition, Illinois EPA received input from the ICCG and the GAC on the development of proposed revisions to Illinois' groundwater quality standards.

Section 6. Work with the Groundwater Advisory Council and the regional groundwater protection and planning committees to sponsor a Groundwater Protection Policy Forum.

This objective was not accomplished; however, planning for a Groundwater Protection Policy Forum to be in 2008 has been implemented.

Section 7. Continue to hold quarterly meetings.

This objective was not accomplished.

Section 8. Provide liaison for the Groundwater Advisory Council.

The ICCG has continued to assist with coordination associated with the GAC by providing meeting agendas and minutes. The ICCG has also continued to review and make recommendations on groundwater research, data collection, and dissemination programs. The ICCG, as well as its subcommittees and work groups, have helped to provide a cooperative process to develop and implement groundwater protection programs in Illinois.

Section 9. Enhance Web-based educational materials.

Illinois EPA's Web site, <http://www.epa.state.il.us/water/groundwater/index.html>, was enhanced to provide additional ICCG information, including nine previously published IGPA biennial reports, ICCG educational materials, and a "Who to Call for Help" directory.

The Illinois State Water Survey (ISWS) Web site now includes pages devoted to water supply planning. These pages were developed to provide current information concerning ongoing statewide and regional water supply planning efforts under the auspices of Executive Order #1-2006. In addition to new material developed specifically for this Web site, there are links to a wide variety of documents and Web resources. Also included are all presentations made by the surveys to the two regional water supply planning committees as well as ISWS presentations to other public interest groups. Material is routinely being added to these pages and may be found at <http://www.sws.uiuc.edu/wsp/>.

The ISWS Center for Groundwater Science also added a page devoted to domestic wells. Links are provided to a number of publications and Web resources, including Illinois EPA, Illinois Department of Public Health (IDPH), and Illinois Association of Groundwater Professionals (IAGP) private well information sites. Domestic well information may be found at <http://www.sws.uiuc.edu/gws/domesticwell.asp>.

Section 10. Assist in implementation of the *Illinois Generic Management Plan for Pesticides in Groundwater*.

The *Illinois Generic Management Plan for Pesticides in Groundwater* targets areas where aquifer materials occur within 50 feet of land surface. These aquifers have been demonstrated to be vulnerable to contamination by pesticides as a result of labeled uses (Goetsch, Bicki and McKenna 1992; Schock et al., 1992). In 1995, the Illinois Department of Agriculture (IDA) contracted with the Illinois State Geological Survey (ISGS) and the ISWS to construct a statewide dedicated groundwater monitoring well network for use with future pesticide management plans. See Chapter IV, Section 6 for further detail on the network and results.

Section 11. Evaluate the development of Class III: Special Resource Groundwater for Dedicated Nature Preserves.

No requests were submitted for review.

Section 12. Review regulated recharge area proposals.

No proposals were submitted for review.

CHAPTER II. GROUNDWATER ADVISORY COUNCIL OPERATIONS

The IGPA also required the creation of the Groundwater Advisory Council (GAC). The GAC is responsible for:

- Reviewing, evaluating, and making recommendations regarding state laws, regulations, and procedures that relate to groundwater protection;
- Reviewing, evaluating, and making recommendations regarding the state’s efforts to implement the IGPA and protect groundwater;
- Making recommendations relating to the state’s needs for groundwater research; and
- Reviewing, evaluating, and making recommendations regarding groundwater data collection and analyses.

The GAC, established in 1988, continues to be integral to development and implementation of effective groundwater protection programs in Illinois. The GAC is comprised of nine members who represent public, industrial, agricultural, environmental, and local government interests. The IGPA mandates that the council members be appointed by the Governor to serve three-year terms. Table 3 provides the members of the GAC.

Table 3. Groundwater Advisory Council members

Bill Compton (Chair)	Business Interest (Caterpillar, Inc.)
Vacant	Public Water Supply Interest
Jack Norman	Environmental Interest (Sierra Club)
George Czapar	Agricultural Interest (University of Illinois - Extension)
Paul McNamara	Local Government Interest (Southwestern Illinois Planning Commission)
Robert Miller	Business Interest (Industry Consultant)
Vacant	Regional Planning Interest
John Liberg	Water Well Drilling Interest (Illinois Association of Groundwater Professionals)
Robert Kohlhasse	Environmental Interest (Farnsworth Group)

Section 1. Conduct meetings in order to review and make recommendations regarding groundwater issues and policies.

The GAC conducted several meetings over the past two years, and provided technical expertise and guidance on several priority policy-related issues including:

- RTK notification process;
- Groundwater standards and radionuclide reporting regulations; and
- Water quantity planning.

Section 2. Conduct policy-related meetings.

The Groundwater Advisory Council held three meetings to discuss water quality and quantity initiatives.

Section 3. Provide input to programs, plans, regulatory proposals, and reports, as appropriate.

Illinois EPA coordinated with the ICCG and the GAC to develop the framework for implementation of the RTK law. Additionally, the GAC established a RTK Subcommittee to

provide input for the development of the notification process, which was finalized during February 2006. The GAC provided recommendations in the form of a resolution that documented the notification process required under the RTK law. The resolution provided input to the Board regulations on water well surveys and community relations work plans. The Board finalized these rules on September 26, 2006. The consensus “Notification Methods Recommendation” from the GAC may be found at [http://www.epa.state.il.us / community-relations/right-to-know/index.html](http://www.epa.state.il.us/community-relations/right-to-know/index.html).

One of the GAC activities during this term focused on providing input to the regulations that were developed during this two-year period. The GAC sponsored a stakeholder outreach meeting for the radionuclide reporting regulations on April 10, 2007, and similarly for proposed amendments to the Board’s groundwater quality standards on May 9, 2007.

CHAPTER III. EDUCATION PROGRAM FOR GROUNDWATER PROTECTION

Section 1. Continue to develop and improve the Web-based information ordering and distribution system.

The ICCG no longer maintains a formal groundwater education program. However, Web-based information is available through a variety of sources as discussed in the following sections.

Section 2. Integrate groundwater education efforts into other state environmental planning and protection programs.

The Governor's state water supply planning initiative (see discussion in Chapter IV, Section 5) called for the creation of two regional stakeholder planning committees. These two committees readily recognized the need to become educated on the water supply issues facing their regions. The ISWS and ISGS are active participants in these educational activities and have provided a variety of printed materials and numerous presentations to stakeholder groups as well as civic organizations interested in the ongoing planning efforts. A water supply planning Web page also has been developed to provide a variety of information to users, especially the stakeholder planning committees. This information may be found at <http://www.sws.uiuc.edu/wsp/>.

Each of the four regional groundwater protection planning committees established by Illinois EPA has created education subcommittees.

Section 3. Work toward enhancing the groundwater protection education resources on a priority basis.

A public educated about groundwater will protect groundwater. The ISWS and ISGS maintain education and outreach programs, as well as Web pages devoted toward education and outreach. The ISWS provides information on all aspects of the water cycle, and contact information for speakers at <http://www.sws.uiuc.edu/chief/educatoutreach.asp>. The ISGS provides information on geology, various field trips, free downloadable short reports, and an "Ask-An-Expert" interface at <http://www.isgs.uiuc.edu/home.shtml>. The ISWS Center for Groundwater Science recently added a page on domestic wells at <http://www.sws.uiuc.edu/gws/domesticwell.asp> that provides links to publications and pertinent Web pages at Illinois EPA, IDPH, and IAGP.

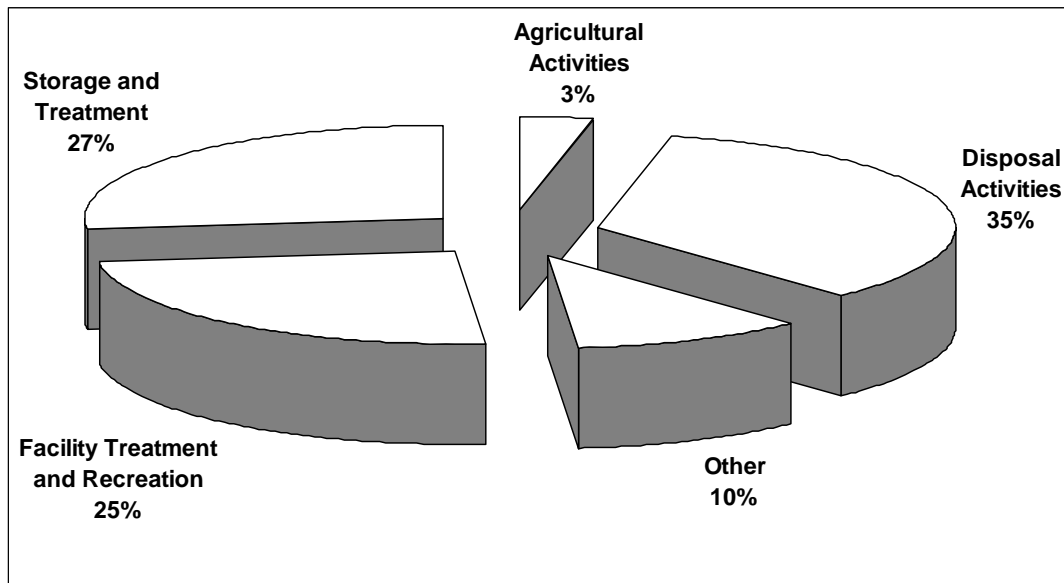
CHAPTER IV. GROUNDWATER EVALUATION PROGRAM

Section 1. Evaluate causes and potential sources of increasing volatile organic compound trend.

The executive summary of this report provides a brief discussion of the statistically significant increasing trend of CWS wells with VOC detections. The causal data show total xylenes and 1,1,1-trichloroethane as the most common VOCs detected. These two contaminants have two of the highest magnitude health-based groundwater standards. For example, the groundwater standard for xylene is 10,000 parts per billion (ppb), whereas the preventive response level is 20 ppb based on the taste and odor threshold.

Illinois EPA used its database of potential sources that have been inventoried as part of well site surveys, hazard reviews, groundwater protection needs assessments, source water assessments, and other special field investigations. Figure 1 shows the most threatening potential contamination sources associated with CWS wells with VOC detects.

Figure 1. Most threatening potential contamination sources in community water supply wells with volatile organic compound detections



Section 2: Work toward supporting the Illinois Water Inventory Program.

The Illinois Water Inventory Program (IWIP) is currently being supported through funding of the state water supply planning initiative created to meet the objectives outlined in Executive Order #1-2006. Good resource planning and accurate scenarios of future water demand require a firm understanding of current and past water withdrawals and withdrawal trends. IWIP tracks withdrawals through voluntary completion and submission of forms sent annually to major water users in the state. Although housed within the ISWS Center for Groundwater Science, surface water withdrawals also are included. The IWIP database of facilities originally was created in 1978 by compiling responses to letters sent to industries listed in the Illinois Manufacturers' Directory, through review of public water supply records of Illinois EPA, and ISWS historical files and

reports. The list of facilities is updated continually through reviews of Illinois EPA records and drillers' reports of high-capacity wells submitted to the ISWS through local health departments. The IWIP database contains site-specific information for about 11,500 active and inactive withdrawal points for 4,450 facilities throughout Illinois. For 2005, the IWIP received an 89 percent return on inquiries sent to 2,781 active facilities, including a 93 percent return from 1,769 community supplies. Approximately 400 million gallons of groundwater supply more than 1,000 community facilities in Illinois each day.

Section 3. Continue to improve the source water assessment and protection geographic information system to include more interactive features.

Section 1453 of the Safe Drinking Water Act (SDWA) required states to develop and implement source water assessment and protection (SWAP) programs. Illinois' SWAP program committed to the development of an Internet geographic information system (GIS) for providing source water assessment information to the public as required. Illinois EPA has completed a major database development project that enhances the SWAP Internet GIS and is currently working with the Illinois Department of Central Management Services to make these enhancements available to the public.

Section 4. Continue to share geographic information system coverages in an electronic format and continue to automate the groundwater resource database for Illinois.

Illinois Natural Resources Geospatial Data Clearinghouse - The Illinois Natural Resources Geospatial Data Clearinghouse (Clearinghouse) continues to provide free Internet access to map and remote sensing resources for Illinois. First brought on-line in July 1997, the Illinois Clearinghouse has been supporting the needs of the mapping and scientific communities for ten years. The Illinois Clearinghouse serves as a gateway to geographically referenced digital data and imagery for Illinois. It provides access to topographic maps, framework orthoimagery collections, historic aerial photography, infrastructure and natural resource data, and scientific data for aquifers and aquifer sensitivity to contamination. Access to a variety of interactive map services, including the popular Illinois Water and Related Wells (ILWATER) map service, is also supported. All data are provided on demand and free of charge to on-line customers. These data can be used to support a variety of GIS and remote sensing applications. The Illinois Clearinghouse receives enthusiastic support from the Illinois GIS user community. To date, over \$1.3 million has been dedicated to expansion and upkeep of the Web site. Financial support to enable on-line access to Illinois data has been sustained through 40 separate grants, contracts, and student internships from state and county agencies, universities, and federal programs.

In 2006, about 140,000 visitors accessed over two million Illinois Clearinghouse Web pages. During its ten-year history, customers of the Illinois Clearinghouse have enjoyed access to more than 27,800 data files and 18,300 historic aerial photos totaling over 35 terabytes of information. The project to enable access to 2005 digital orthoimagery collections prompted requests from Google, Mapquest, Microsoft Earth, Navteq, the Nature Conservancy, the National Weather Service, and FutureGen partner agency representatives. A Web search for the keywords "Illinois" and "GIS" offers the Illinois Clearinghouse as the first Web site returned at Google, Yahoo, AOL, and Ask.com. By providing open access to a base data set for the state, the Illinois Clearinghouse fosters a climate of data sharing and multi-agency coordination. The Illinois Natural Resources Geospatial Data Clearinghouse may be found at <http://www.isgs.uiuc.edu/nsdihome>.

ILWATER Interactive Mapping Service - In 2004, the ISGS designed and released ILWATER, an on-line interactive mapping service that provides access to a database of over 275,000 Illinois water and related well records. The well database has been in development for many years by the ISGS, but the well records had only been available during regular business hours at the ISGS offices in Champaign. With the availability of the ILWATER on-line mapping service, anyone with Internet access can readily access water well information that has been collected by the ISGS. This extensive database of geological information and other data from well records is available to the public via an interactive map Web site at <http://www.isgs.uiuc.edu/maps-data-pub/wwdb/launchims.shtml>.

With the ILWATER interactive map service, users can navigate to specific locations in Illinois using easy “point and click” techniques. In addition, people can define an area of interest, find all the known wells in the area, and select subsets of the well data. By clicking on individual well locations, users can view information about location and ownership of water wells, coal test borings, and engineering test wells. In addition, users can also view information, such as total depth and a description of subsurface units (sand, gravel, limestone, etc.), as well as the depth of the top and bottom of each unit. The Illinois water well Web page is easy to use and features well locations for the entire state displayed with well known geographic references including highways, county and township boundaries, lakes, municipalities, orthoimagery, and statewide maps of the aquifers. Limited data on outcrops have also been included as part of the ILWATER reference map layers.

The ILWATER mapping service continues to be well received, particularly by engineers, well drillers, and homeowners. During the last year, the ILWATER service was featured at several professional meetings in Illinois including those of the Illinois Specialty Growers Association, IAGP, and the Illinois Farm Bureau. In addition, the ILWATER Web site was demonstrated to approximately 60 drilling contractors at an IAGP contractor continuing education seminar in Mt. Vernon, Illinois.

During 2007, the ILWATER Web site recorded about 2,400 visits per month. About 750 unique visitors use the ILWATER site each month for an average duration of about 15 minutes. The duration of visit indicates that people are using the Web site to find the information that they need. ISGS staff members continue to receive many positive comments about the ILWATER mapping service.

Section 5. Continue to conduct groundwater assessments and share the information through regular updates and completed reports.

The occurrence, extent, availability, and quality of groundwater resources continue to be of significant interest in several parts of the state. During the 2006 and 2007 reporting period, ISGS and ISWS scientists were very involved with studies pertaining to groundwater resources in several areas of the state, especially northeastern and east-central Illinois and the Metro East St. Louis area, as well as the fate and transport of contaminants in shallow groundwater.

Northeastern Illinois - The five-year study by the ISGS and ISWS to map and assess the groundwater resources of Kane County is nearing completion in 2007 with the release of final maps showing the bedrock geology (Dey, Davis, and Curry, 2007b), major Quaternary aquifers (Dey, Davis, and Curry, 2007c), geologic cross sections (Dey, Abert, Davis, and Curry, 2007), and aquifer sensitivity to contamination (Dey, Davis, and Curry, 2007a). Abert, Dey, Davis, and Curry (2007) published the three-dimensional geologic model of Kane County with descriptive text. The

final report on the geologic investigations for the Kane County water resources investigations is in review. The ISWS produced a final report on potentiometric surface mapping in the county (Locke and Meyer, 2007). ISWS reporting of regional deep bedrock and local shallow aquifer groundwater flow modeling will be completed in 2008. Modeling results have been made public at numerous civic meetings, most notably a workshop sponsored by Kane County for local elected officials and area planners where the state scientific surveys presented results of geologic and hydrologic research.

The study of the geology and groundwater resources of Kendall County by the ISGS and ISWS continued during 2006 and 2007 with drilling and geophysics by the ISGS and groundwater level measuring and well sampling by the ISWS. The results of this three-dimensional hydrogeologic mapping study will assist the county in identifying, characterizing, managing, and protecting its groundwater resources.

A final report updating regional northeastern Illinois pumpage from the Cambrian-Ordovician Aquifers was published (Burch and Wehrmann, 2007). More recently, the state surveys have been in contact with McHenry County to provide a more detailed assessment of their groundwater resources, updating information assembled by the state surveys in the 1990s, plus groundwater flow modeling of important shallow aquifers.

Metro East St. Louis - The availability of groundwater resources and the sensitivity of aquifers to contamination are of increasing importance in the Metro East St. Louis area (Madison, Monroe, and St. Clair Counties). The lithostratigraphic framework of the Quaternary deposits, which is established by mapping these deposits, provides the basis for identifying, describing, and mapping the extent, thickness, and characteristics of the aquifer and non-aquifers within these deposits. Mapping of the Quaternary deposits by the ISGS is done on the basis of the 7.5' topographic quadrangle, that is, at a scale of 1:24,000. The Quaternary deposits include all of the sediments that occur between the bedrock surface and land surface. The quadrangles mapped during 2006 and 2007 include Mascoutah (Grimley, 2006), Grantfork (Grimley and Phillips, 2006), and Lebanon (Phillips and Aper, 2006). Once the component 7.5' quadrangles within a county have been completed, they are compiled into a countywide map, such as the "Surficial Geology of Madison County, Illinois" (Grimley and Phillips, 2006).

Mahomet Aquifer - Studying the hydrogeology of the Mahomet Aquifer and the aquifers overlying it remains a high priority at the state surveys. The Mahomet Aquifer, which extends from the Indiana state line to the Illinois River, is the major groundwater resource in east and central Illinois. The ISGS recently completed test drilling at six locations in southwest Champaign and east-central Piatt Counties. Using the wireline or forward mud rotary method, the initial testhole at each location was drilled through the entire thickness of unconsolidated sediment and a few feet into the underlying bedrock. After the drilling was completed, a natural gamma geophysical log of the testhole was obtained. A geophysical log complements the descriptive logs prepared by the geologist during the drilling process. Observation wells were installed in the Mahomet Aquifer and aquifers in the overlying Glasford Formation at each location. Seismic and electrical earth resistivity surveys were conducted in the area in support of the drilling. The results of these surveys greatly assist in correlating the data obtained from one testhole to the next and in determining the continuity and properties of sedimentary units between testholes.

ISWS scientists are collecting water level measurements from wells completed in the Glasford and Mahomet Aquifers. A recent potentiometric surface map of the Glasford Aquifer shows similar

trends as the 2005 potentiometric surface map of the Mahomet Aquifer and includes the large cone of depression west of Champaign. The difference in water levels between the two aquifers is less than 10 feet across much of the county, suggesting that the interconnection between the two aquifers in western Champaign County is more extensive than previously believed. Measurements of wells completed in shallower (< 100' in depth) Glasford and Wedron sands show much higher water levels, suggesting these sands are not connected to deeper Glasford and Mahomet sands. Digital recording data loggers have been placed in Mahomet and Glasford Aquifer wells to begin long-term collection of water level data. A series of synoptic flow measurements were collected along five segments of the Middle Fork of the Vermilion River in northeastern Champaign County and southeastern Ford County. Further flow measurements and detailed elevation surveys will be performed to better understand the stream/aquifer interaction. In addition, several studies of arsenic occurrence and distribution in the Mahomet and Glasford Aquifers and low-cost removal techniques were published (Holm et al., 2006; Holm and Wilson, 2006; Peyton et al., 2006a and 2006b; Sanford et al., 2006).

The data acquired will support ongoing geological and hydrogeological research of the Mahomet Aquifer and the shallower aquifers that includes the development of three-dimensional geological and hydrogeological maps and improved flow model of these aquifers. With continued development of the groundwater resources found in east-central Illinois, the understanding gained from the research is integral to addressing issues of groundwater planning and management as is currently being accomplished through the Governor's state water supply planning initiative. The ISGS, ISWS, United States Geological Survey (USGS)/Urbana, and DNR/Office of Water Resources continue to serve as technical advisors to MAC, which has sought funding and support for studying the Mahomet Aquifer. For more information, see the consortium's Web site at <http://www.mahometaquiferconsortium.org/>.

Statewide and Regional Water Supply Planning - On January 9, 2006, Governor Rod Blagojevich issued Executive Order #1-2006, which called for the development of a comprehensive, statewide water supply planning and management strategy by July 2009.

In response, a strategy development process was initiated for two priority planning areas in Illinois, one in northeastern Illinois and another in east-central Illinois. These two areas were chosen on the basis of limited water supply availability and substantial population and economic growth. Improved water supply planning and management of these aquifers and watersheds will help ensure current and future water demands can be met and conflicts minimized (see Wehrmann and Knapp, 2006 at <http://www.sws.uiuc.edu/pubdoc/IEM/ISWSIEM2006-04.pdf>).

An 11-county regional water supply planning group for northeastern Illinois, composed of 35 members representing nine stakeholder groups, was created in November 2006, facilitated by CMAP. More information about the northeastern regional water supply planning group is available from the CMAP Web site at <http://www.chicagoareaplanning.org/watersupply/>. A 12-member regional water supply planning group for east-central Illinois was organized in February 2007, facilitated by the MAC. More information about the planning group is available from the MAC Web site at <http://www.mahometaquiferconsortium.org/>. These two regional stakeholder water supply planning groups are tasked with creating plausible water demand scenarios to the year 2050.

In addition, the ISGS is compiling existing information about the hydrogeology of northeastern and east-central Illinois to make it available to the two regional planning groups. Some additional

data also is being collected from limited scientific test drilling and geophysical exploration within the Fox River Basin in northeast Illinois and in the Mahomet Aquifer system in east-central Illinois. This information is being used by the ISWS to create a regional groundwater flow model for shallow aquifers in the Fox River Basin and to improve the existing Mahomet Aquifer system model. These two flow models and the ISWS northeastern Illinois regional flow model of the deep bedrock aquifer system will be used to evaluate the impacts of groundwater pumping to meet the 2050 water demand scenarios.

The regional stakeholder groups will be involved in evaluating all the information to address water supply planning and management issues and recommending alternatives to meeting water needs, as well as helping to identify what additional information is needed for regional water supply planning in their respective areas. More information about the overall water supply planning process can be found on the ISWS Web site at <http://www.sws.uiuc.edu/wsp/>.

The ISWS also prepared two documents related to drought planning (Winstanley et al., 2006a and 2006b). The intent of these products was to provide planners with information and a framework to follow for drought preparedness (as opposed to drought response). Other states have discovered during recent worst-case droughts that contingency planning, as practiced by many CWSs in Illinois, is not a wise substitute for drought-preparedness planning. In Illinois, about 35 of 90 existing surface water supply facilities (e.g., streams, reservoirs, pumps, pipelines, treatment facilities) likely would experience severe impacts during a 50-year drought, and worse droughts would have more serious impacts on an even greater number of public and private surface water and groundwater systems. On the basis of their shallow depth, proximity to other shallow community wells, and proximity to identified streams, 208 wells representing 82 communities are deemed potentially vulnerable to drought conditions. Drought impacts can be reduced by incorporating information on water availability and demand into evaluations of system capacity and then developing appropriate drought-tolerant capacities. Assessments for several small communities are underway through funding from the Midwest Technology Assistance Center. Assessments for 12 communities have been completed and another 24 are nearly done. All will be posted on the Midwest Technology Assistance Center Web site at <http://mtac.sws.uiuc.edu/>.

Assessment Techniques - Techniques to enhance the gathering, analysis, and three-dimensional display of data for the investigation and assessment of groundwater resources continue to be developed. A multi-channel landstreamer system for efficiently conducting surface wave seismic surveys has been completed. Multi-channel analysis of the surface wave data results in two-dimensional shear wave seismic velocity depth profiles to depths reaching approximately 150 feet. Shear wave seismic velocity is a parameter that is useful in characterizing and mapping geologic materials.

Geologic mapping is integral to establishing a lithostratigraphic framework that provides a basis for mapping aquifers and aquitards, the hydrogeologic framework that is the foundation for assessing groundwater resources and addressing groundwater resource issues. ISGS geologic mapping remains focused on the collar counties around Chicago, the Metro East St. Louis area, and southern Illinois. Published maps can be found on the ISGS Web site at <http://www.isgs.uiuc.edu/maps-data-pub/maps.shtml>.

The ISWS continues to offer aquifer testing services to communities and industries seeking new or expanded groundwater resource pumping capability. Often, aquifer testing follows geophysical exploration, especially electrical earth resistivity, by the ISGS. In 2006 and 2007, the ISWS

conducted aquifer tests for Petersburg (Menard County) and Chatham (Sangamon County) and assisted consultants to The Anderson's (Champaign County). Drilling for Chatham in the Sangamon River bottoms was predicated on electrical earth resistivity investigations completed by the ISGS.

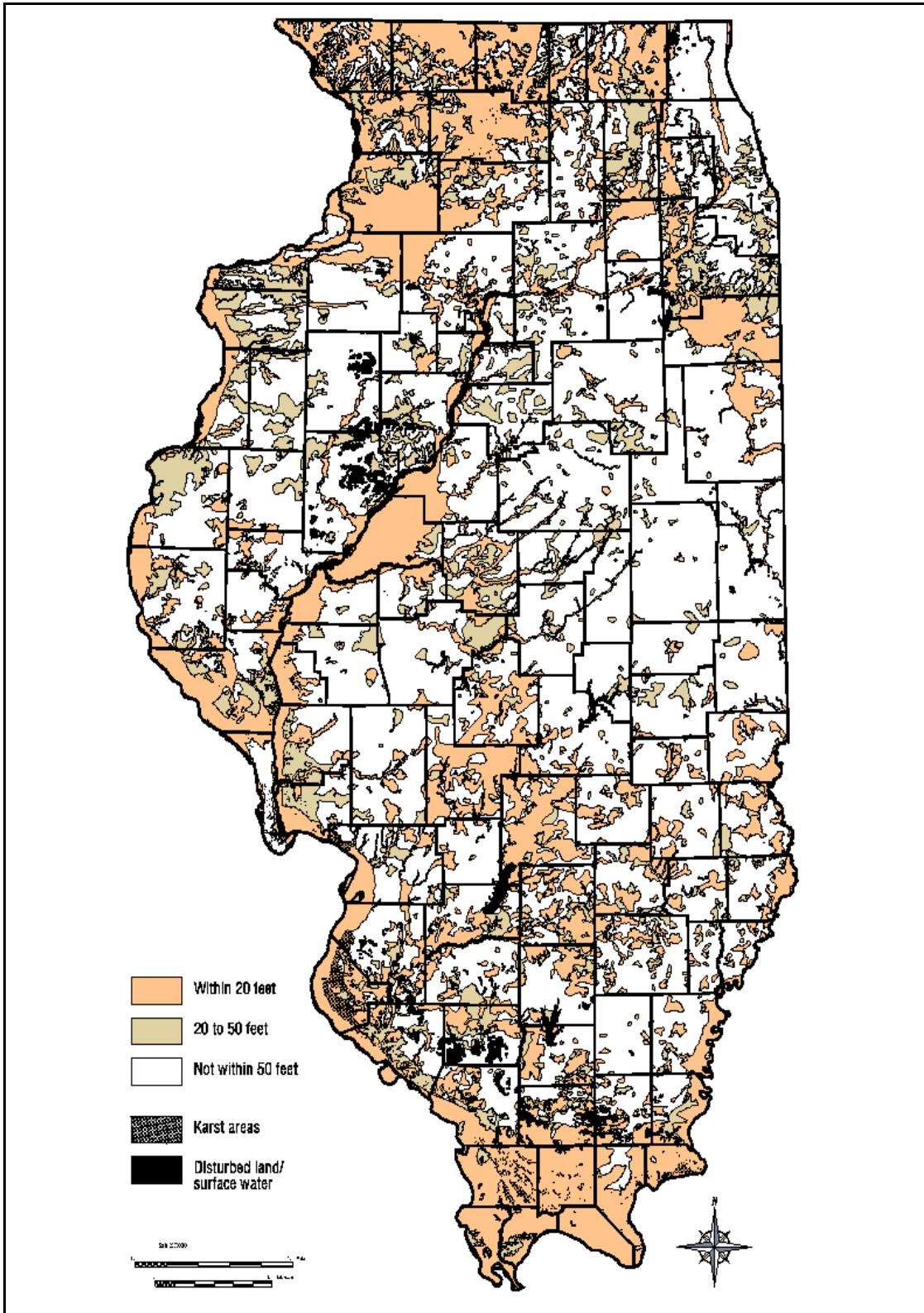
Groundwater Quality and Agricultural Chemicals - Recent collaborative work between the ISGS and ISWS has developed a technique for separating background concentrations of nitrate from anomalous ones (Panno et al., 2006, 2007b). Using geochemical data, with an emphasis on the stable isotopes of nitrogen and oxygen, Mehnert et al. (2006, 2007) and Sahoo et al. (2006) attempted to determine sources and fate of nitrate in groundwater and surface water in Illinois. This research was done in a variety of environments, including tile drains and groundwater in row crop areas and groundwater in the karst region of southwestern Illinois.

Section 6. Continue to utilize innovative and cost effective methods to implement statewide groundwater quality monitoring.

Dedicated Monitoring Well Network for Illinois Generic Management Plan for Pesticides in Groundwater - The monitoring well network is designed to provide statistically reliable estimates on the occurrence of selected pesticides in groundwater within shallow aquifers (depth to the top of aquifer material less than 50 feet below land surface shown in Figure 2) in areas of corn and soybean production. Occurrence is defined as the presence of a specific pesticide at a concentration above the minimum reporting level.

The network was designed to determine the regional impacts of pesticide leaching from nonpoint sources, not the impacts of site-specific point sources. The network is not a research program, but a tool for the management of pesticides in Illinois. Consequently, the pesticides selected as analytes are those with high use in Illinois and/or were previously detected in groundwater in Illinois or other midwestern states. Also reflecting the management tool approach is the decision to set minimum reporting levels at a maximum of five percent of the groundwater reference value, but not to expend limited laboratory resources on detecting pesticides at very low concentrations. The monitoring network and IDA's pesticide laboratory operate in compliance with U.S. EPA-approved quality assurance project plans.

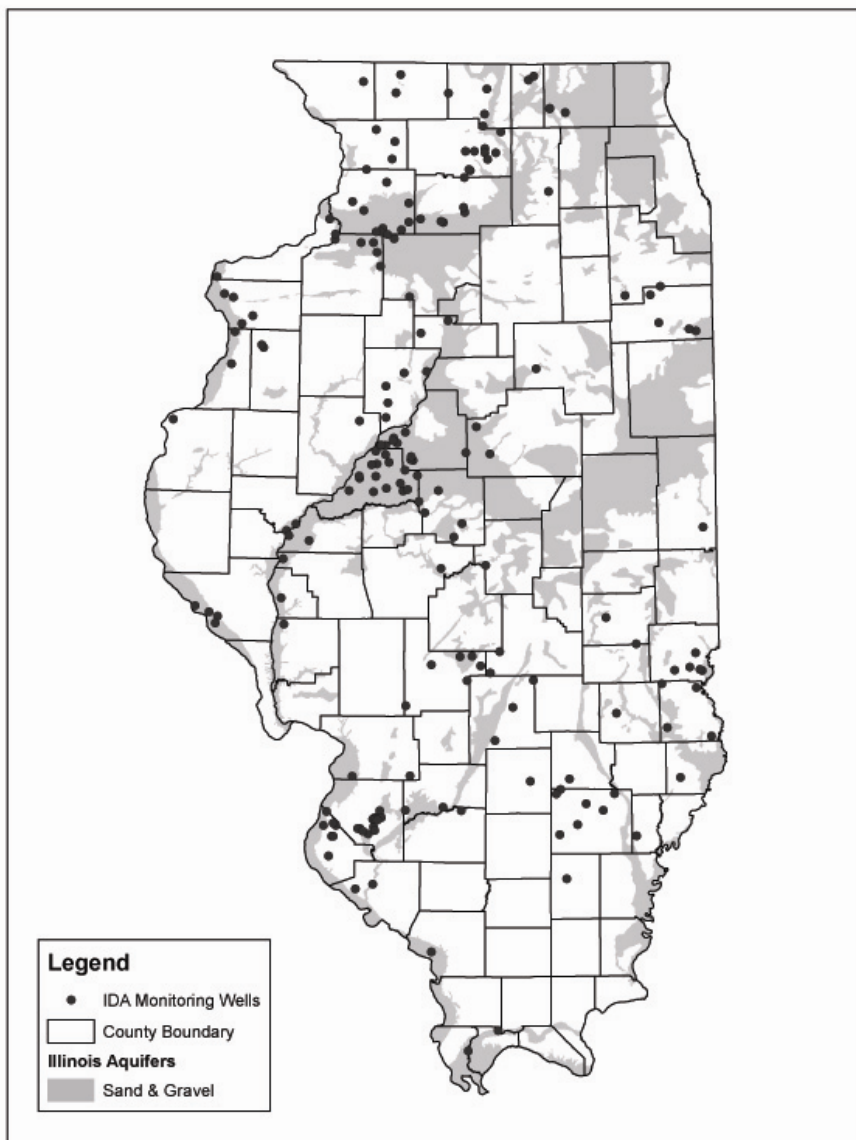
Figure 2. Aquifer material less than 50 feet below land surface



The network currently consists of 144 shallow groundwater-monitoring wells, varying in depth from 10 to 83 feet, located throughout the state (Figure 3). Wells are constructed of two-inch inside diameter PVC well casing. Most wells have a five-foot long slotted well screen. Each well is located in public rights-of-way adjacent to row crop fields. All of the wells are installed in areas where aquifer materials occur within 50 feet of land surface.

Each well in the network is sampled once during a two-year period. The ISGS and ISWS conducted a one-time sampling of the network beginning in the fall of 1998 and sampled the network from September 2000 through June 2001. IDA assumed responsibility for all sampling in July 2001. IDA will continue to sample the entire network of wells in two-year cycles.

Figure 3. Illinois Department of Agriculture dedicated pesticide monitoring well network locations



Four rounds of sampling of the monitoring wells have been completed. During these periods, analytical detection levels and minimum reporting levels have varied. In order to allow comparison between the sampling periods, the following data on the frequency of occurrence reflect the presence of a pesticide at or above the minimum reporting levels used in the most recent sampling round in 2004 through 2006 (Table 4). The overall frequency of occurrence refers to the presence of any pesticide, or multiple pesticides, from a single groundwater sample. For example, the occurrence of two pesticides present in a single well sample at concentrations above the minimum reporting level is considered a single detection above the minimum reporting level.

Table 4. Minimum reporting levels, action levels, and groundwater reference levels

Analyte	Minimum Reporting Level (ug/l)	Action Level Value (ug/l) ¹	Groundwater Reference Value (ug/l)	2004-2006 Frequency of Occurrence (%)
acetochlor	0.10	0.2	2 ²	0
acetochlor ESA	0.30	--	--	8.7
acetochlor OXA	0.30	--	--	0.7
alachlor	0.10	0.2	2	0
alachlor ESA	0.30	--	--	36.9
alachlor OXA	0.30	--	--	0
atrazine	0.15	0.3	3 ³	4.3
desethylatrazine (DEA)	0.15	--	--	8
desisopropylatrazine (DIA)	0.15	--	--	3.6
deethyldeisopropylatrazine (DEDIA)	0.15	--	--	12.3
metolachlor	1.0	10	100 ⁴	2.2
metolachlor ESA	0.30	--	--	50.7
metolachlor OXA	0.30	--	--	13.8
metribuzin	1.0	20	200 ⁴	0
prometon	1.0	10	100 ⁴	0
simazine	0.40	0.4	4 ³	0

¹ Action level equals 10 percent of the Groundwater Reference <http://www.epa.gov/waterscience/drinking/standards/dwstandards.pdf>
² Calculated on the basis of the Reference Dose, which is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.
³ Groundwater Quality Standards for Class I: Potable Resource Groundwater, Illinois Admin. Code Part 620.410.
⁴ HA: Health Advisory. An estimate of acceptable drinking water levels for a chemical substance based on health effects information; a Health Advisory is not a legally enforceable federal standard, but serves as technical guidance to assist federal, state, and local officials.

From September 1998 through August 1999, samples were collected from 112 network wells and analyzed for the presence of 14 pesticides (Mehnert et al. 2001). Results indicate an overall frequency of occurrence of 6.3 percent. Results of the second round of sampling of the network wells (148 samples collected between September 2000 and August 2002) indicate an overall frequency of occurrence of 3.4 percent. Atrazine was detected in three samples and two of those samples had concentrations (0.58 and 0.85 ug/l) above the action level of 0.3 ug/l. Cyanazine, metribuzin, and metolachlor were each detected in one sample, but none of those samples had concentrations above levels of concern. Results of the third sampling period (142 samples

collected from October 2002 through September 2004) indicate that parent pesticides were detected in three of the 142 samples (2.1 percent). Atrazine was detected in two samples, and metolachlor was detected in one sample. None of those samples had concentrations above levels of concern. One or more of the atrazine degradation products (desethylatrazine, desisopropylatrazine, and desethyldeisopropyl atrazine) were present above the minimum reporting levels in 18.3 percent of the samples.

Results of the most recent sampling period (138 samples collected from October 2004 through September 2006) indicate that parent pesticides were detected in eight of the 138 samples (5.8 percent). Atrazine was detected in six samples, and metolachlor was detected in three samples. None of those samples had concentrations above levels of concern. One or more of the atrazine degradation products (desethylatrazine, desisopropylatrazine, and desethyldeisopropyl atrazine) was present above the minimum reporting levels in 14.5 percent of the samples. In 2004, IDA added metabolites of the chloroacetanilide herbicides (alachlor, acetochlor, and metolachlor) to the list of analytes. One or more of these metabolites was detected in more than 50 percent of the samples. None of those samples had concentrations above levels of concern.

IDA intends to continue to follow the sampling and analysis plan laid out in the generic management plan and the quality assurance project plan for the foreseeable future. If current trends in the occurrence of pesticides continue, some adjustments to the sampling plan may be considered.

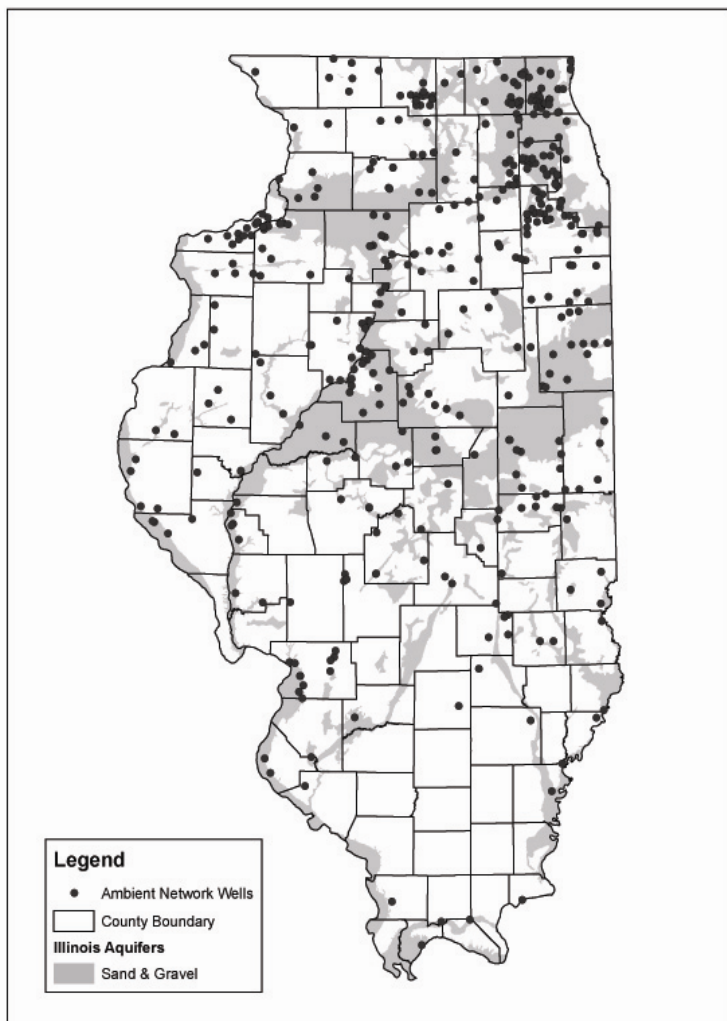
CWS Ambient Groundwater Monitoring Network - Illinois EPA continues to operate an Ambient Groundwater Monitoring Network (Ambient Network) of CWS wells consisting of 356 fixed locations, as shown in Figure 4. The Ambient Network rotates from the fixed station to special or intensive monitoring locations every other year. The Ambient 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 Water Act and SDWA program activities in protecting groundwater in Illinois.

The design of this Ambient Network was completed after consultation with the USGS, ISGS, and ISWS. Illinois EPA developed a random stratified network (fixed stations) intended to represent contamination levels in all active CWS wells. The CWS well Ambient Network is stratified by depth, aquifer type, and the presence of aquifer material within 50 feet of land surface.

Additionally, the network is based on a probability of occurrence that will provide a 95 percent statistical confidence in the data with an associated plus or minus five percent precision and accuracy level. In order to randomize the sampling schedule spatially and temporally, 17 random groups of 21 wells, with alternates, were selected from all the active wells in the state.

Figure 4. Ambient Groundwater Monitoring Network wells

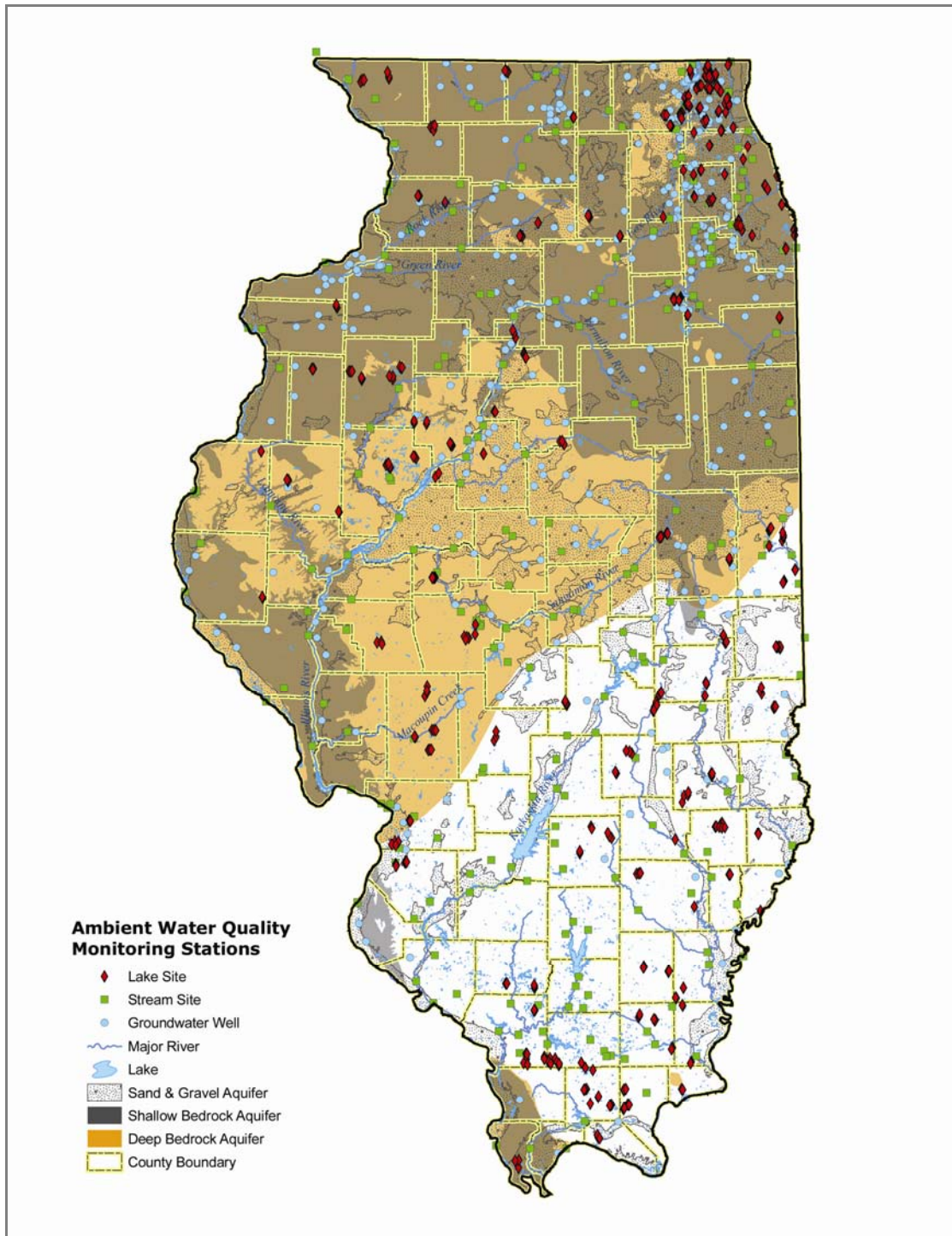


Each of these 17 random groups is a sample period. To further assure maximum temporal randomization within practical constraints, the samples from each sample period are collected over a three-week period. In 2004, the 356 Ambient Network wells were sampled for inorganic chemicals (IOCs) and VOCs. In addition, approximately 50 percent were sampled for synthetic organic compounds (SOCs).

This Ambient Network is rotated every other year. The purpose of the rotating monitoring network is to maximize resources and increase groundwater quality monitoring coverage at CWS wells. Illinois EPA is able to concentrate on specialized monitoring at high priority areas during alternate years.

Illinois EPA has also refined its integrated BOW monitoring strategy by evaluating the proximity to ambient surface water monitoring stations, as shown in Figure 5.

Figure 5. Illinois EPA's integrated surface and groundwater monitoring network sites



United States Geological Survey Illinois River Basin National Water Quality Studies - As part of the National Water Quality Assessment (NAWQA) program, the USGS is assessing both the Lower and Upper Illinois River Basins (LIRB and UIRB, respectively). A summary report of the LIRB data collection is available (USGS Circular 1209); a similar summary of the UIRB activities (USGS Circular 1230) was completed in December 2003.

In July and August 2007, the USGS NAWQA program sampled 17 public supply wells in the Mahomet Aquifer (Figure 6) in a one-time assessment of raw and treated groundwater source drinking water. Raw groundwater was collected at a specific well and analyzed for VOCs, pesticides, selected pesticide transformation products, compounds specific to human waste water, and bacteria (Table 5). Treated wastewater was also sampled and analyzed for a similar set of constituents plus trihalomethanes. These data should be available after January 2008.

Figure 6. United States Geological Survey National Water Quality Assessment network wells

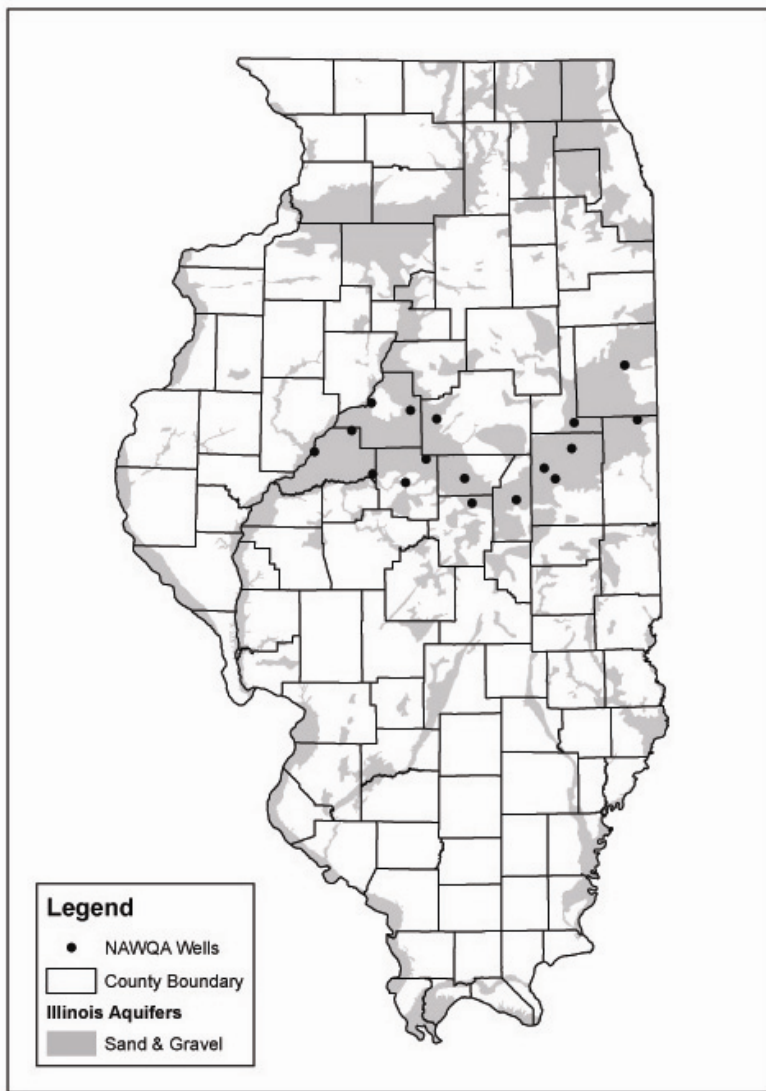


Table 5. Other anthropogenic compounds analyzed in National Water Quality Assessment network wells

Compound	Primary Use or Source
1-Methylnaphthalene	Gasoline
2,6-Dimethylnaphthalene	Gasoline
2-Methylnaphthalene	Gasoline
3-beta-Coprostanol	Plant- or animal-derived biochemical
3-Methyl-1(H)-indole (Skatole)	Plant- or animal-derived biochemical
3- <i>tert</i> -Butyl-4-hydroxy anisole (BHA)	Personal care and domestic use products
4-Cumylphenol	Personal care and domestic use products
4- <i>n</i> -Octylphenol	Personal care and domestic use products
4- <i>tert</i> -Octylphenol	Personal care and domestic use products
5-Methyl-1H-benzotriazole	Manufacturing additive
Acetophenone	Personal care and domestic use products
Acetyl hexamethyl tetrahydronaphthalene (AHTN)	Personal care and domestic use products
Anthracene	Pavement & combustion
Anthraquinone	Organic synthesis compound
Benzo[<i>a</i>]pyrene	Pavement & combustion
Benzophenone	Personal care and domestic use products
beta-Sitosterol	Plant- or animal-derived biochemicals
beta-Stigmastanol	Plant- or animal-derived biochemicals
Bisphenol A	Manufacturing additive
Caffeine	Personal care and domestic use products
Camphor	Personal care and domestic use products
Carbazole	Organic synthesis compound
Cholesterol	Plant- or animal-derived biochemical
Cotinine	Personal care and domestic use products
d-Limonene	Personal care and domestic use products
Fluoranthene	Pavement & combustion
Hexahydrohexamethylcyclopentabenzopyran (HHCb)	Personal care and domestic use products
Indole	Personal care and domestic use products
Isoborneol	Personal care and domestic use products
4-octylphenol diethoxylate (OPEO2)	Personal care and domestic use products
4-octylphenol monoethoxylate (OPEO1)	Personal care and domestic use products
4-Nonylphenol	Personal care and domestic use products
<i>p</i> -Cresol	Solvent
Pentachlorophenol	Fungicide
Phenanthrene	Pavement & combustion
Phenol	Personal care and domestic use products
Pyrene	Pavement & combustion
Tri(2-butoxyethyl)phosphate	Manufacturing additive
Tri(2-chloroethyl)phosphate (TCEP)	Manufacturing additive
Tributyl phosphate	Manufacturing additive
Triclosan	Personal care and domestic use products
Triethyl citrate (ethyl citrate)	Personal care and domestic use products
Triphenyl phosphate	Manufacturing additive
Tris(dichlorisopropyl)phosphate (TCPP)	Manufacturing additive

In 2002 and 2005 a five-well subset of the original Mahomet Aquifer network of wells was resampled for suites of pesticides, trace elements, and VOCs. In May and June of 2007, the NAWQA program resampled a network of 30 wells in the Mahomet Aquifer that were first sampled in 1996. The wells are mostly private water supplies and a few production wells. They were sampled for a large suite of constituents including VOCs, pesticides, and dissolved hydrogen. A subset of five of these wells is resampled in odd-numbered years.

Two UIRB land use groundwater study networks were resampled in 2002, 2005, and 2007. These were also five-well subsets of the networks sampled originally. The five-well sample subsets of the land use studies will continue to be collected in odd-numbered years.

In 2004 and 2005, a new urban land use network of monitoring wells was installed in the St. Louis metropolitan area as part of cycle two of the LIRB. The complete network of 24 monitor wells (13 in Illinois and 11 in Missouri) in recently developed (since 1980) residential or commercial land cover, plus two reference wells, was sampled during July and August 2005. Samples were analyzed for pesticides, VOCs, and trace elements. Most well samples were also analyzed for sulfur hexafluoride to estimate the date of recharge. A subset of five wells and a reference well were resampled in July 2007. This subset of six will be resampled in odd-numbered years, and the entire network will be resampled in 2015.

The USGS has developed a new data warehouse Web site that provides for data delivery and mapping. A new USGS publication is available showcasing the features and capabilities of the NAWQA Data Warehouse Web site at <http://pubs.usgs.gov/fs/2006/3101/>.

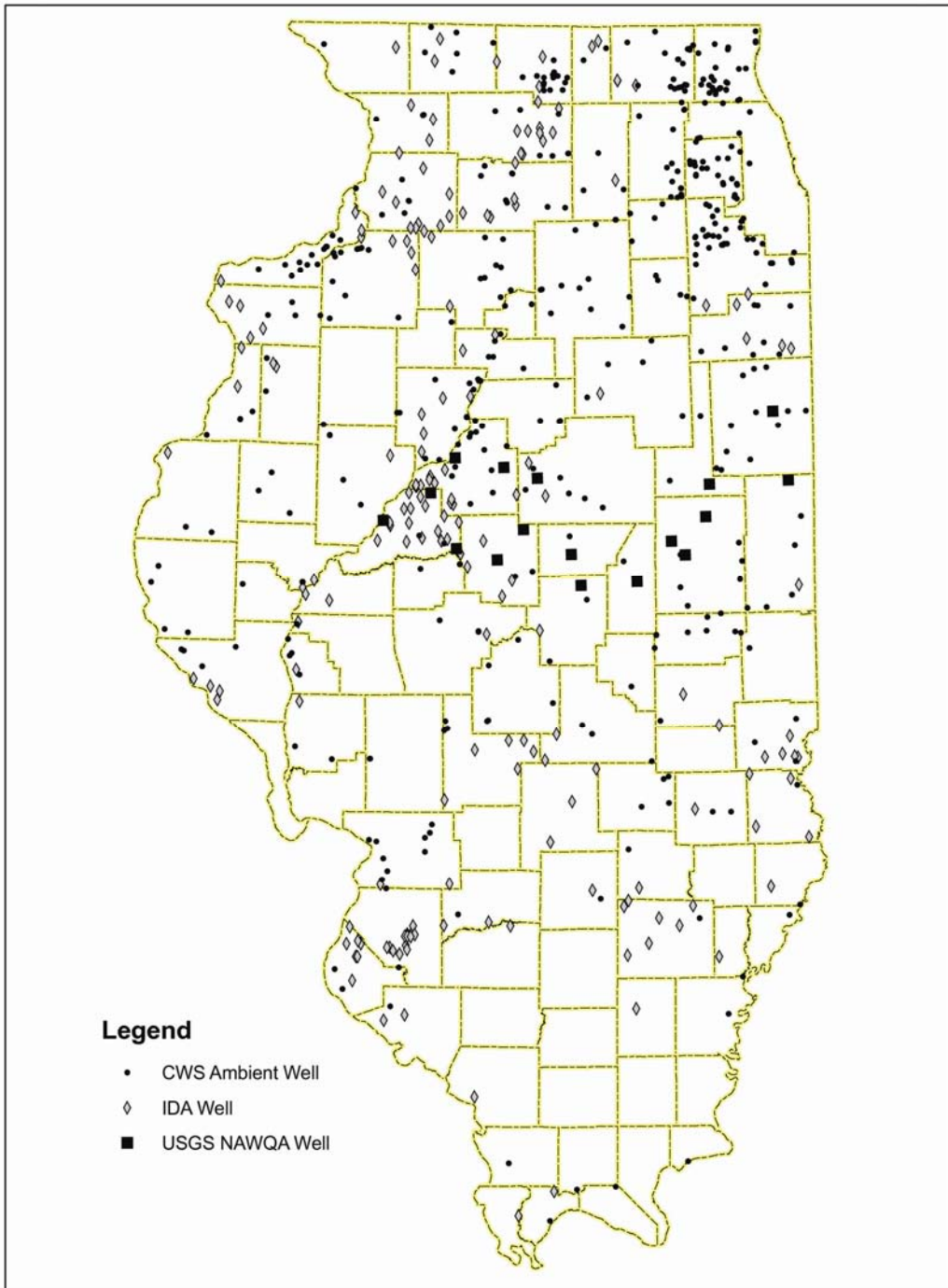
USGS Groundwater Climate Response Network - The USGS measures more than 20,000 wells each year for a variety of objectives as part of federal programs and in cooperation with state and local agencies. Water level data are collected using consistent data collection and quality control methods. A small subset of these wells meets the criteria necessary to be included in a “Climate Response Network” of wells designed to illustrate the response of the groundwater system to climate variations nationwide. The primary purpose of the Climate Response Network is to portray the effect of climate on groundwater levels in unconfined aquifers or near-surface confined aquifers that are minimally affected by pumping or other anthropogenic stresses. The Climate Response Network Web site, <http://groundwaterwatch.usgs.gov/>, is the official USGS Web site for illustrating current groundwater conditions in the United States and Puerto Rico.

Section 7. Continue assessing and evaluating emerging contaminants of concern.

To better assess emerging contaminants of concern, Illinois EPA has developed a map that integrates the wells from the three monitoring networks described above into one map, as shown in Figure 7. This allows for spatial correlation between the networks. IDA’s dedicated monitoring well and USGS NAWQA well networks have been assessing emerging contaminants of concern.

In addition, Illinois EPA evaluated the electronically reported groundwater data for all Illinois Resource Conservation and Recovery Act and solid waste facilities under its purview. The Illinois EPA BOL Permit Section provides regulatory oversight for these facilities. A data query was conducted for a list of approximately 300 groundwater parameters not included in 35 Ill. Adm. Code 620, Subpart C. The data set evaluated spanned from April 1984 to April 2004. Illinois EPA has also evaluated confirmed groundwater contaminants at various cleanup sites. This effort identified a whole series of emerging contaminants of concern, including perchlorate.

Figure 7. Integrated Illinois EPA, Illinois Department of Agriculture, and United States Geological Survey monitoring network wells



Section 8. Continue to implement and improve overall groundwater quality indicators.

Illinois EPA has improved the overall groundwater quality indicators by conducting the first long-term trend analysis of VOCs in CWS wells.

CHAPTER V. RIGHT-TO-KNOW INITIATIVES

Section 1. Obtain input from the Groundwater Advisory Council on notice methods and associated rules.

See the discussion under GAC operations in Chapter II of this report.

Section 2. Continue to issue community water supply well-centric (triggered by detection in public water supply wells) notices in coordination with Illinois Department of Public Health.

Illinois EPA continues to issue CWS well-centric RTK notices in coordination with the IDPH. A total of nine well-centric notifications were completed during this reporting period.

Section 3. Implement the evaluation and notification requirements under the Right-to-Know law.

Illinois EPA continues to evaluate sites required to conduct notification pursuant to the RTK law. Table 6 provides a list of notifications performed or currently under review. A summary of each notification listed is provided under the RTK Web page at <http://www.epa.state.il.us/right-to-know/>.

Table 6. Right-to-Know notifications performed or under review

COUNTY	CWS NAME	COMMENTS
Adams	Mill Creek Public Water District	RTK Notification performed
Boone	Belvidere	RTK Notification performed
Bureau	Sheffield	RTK Notification performed
Cass	Beardstown	RTK Notification performed
Clark	Union-York Public Water District	RTK Notification performed
Cook	Crestwood	Under Review
Cook	Ford Heights	RTK Notification performed
Cook	South Chicago Heights	RTK Notification performed
Cook	Streamwood	Under review
DeKalb	Hinckley	RTK Notification performed
DeKalb	Sandwich	RTK Notification performed
DuPage	Downers Grove	RTK Notification performed
DuPage	Belmont-Highwood Public Water District	RTK Notification performed
DuPage	Maple Hill Improvement Association	RTK Notification performed
Ford	Piper City	No detects-consultant to do site-centric notification
Henry	Kewanee	No detects-consultant to do site-centric notification
Henry	Kershaw Mobile Home Park	RTK Notification performed
Jersey	Grafton	RTK Notification performed
Jo Daviess	Scales Mound	RTK Notification performed
Kane	Carpentersville	RTK Notification performed
Kane	East Dundee	RTK Notification performed
Kane	South Elgin	Under review
Kane	Montgomery	Under review

COUNTY	CWS NAME	COMMENTS
Kane	Lake Marian	RTK Notification performed
Kankakee	Momence	RTK Notification performed
Kendall	Plano	RTK Notification performed
Knox	Galesburg	No detects-Illinois EPA to do site-centric notification
Lake	Wauconda	No detects-consultant to do site-centric notification
Lake	Island Lake	RTK Notification performed
McHenry	Crystal Lake	RTK Notification performed
McHenry	Fox River Grove	RTK Notification performed
McHenry	Harvard	RTK Notification performed
McHenry	Hebron	RTK Notification performed
Madison	Edwardsville	RTK Notification performed
Menard	Petersburg	RTK Notification performed
Montgomery	Nokomis	RTK Notification performed
Ogle	Byron	RTK Notification performed
Peoria	Princeville	RTK Notification performed
Pike	Hull	RTK Notification performed
Putnam	Hennepin Public Water District	Under review
Stephenson	Freeport	RTK Notification performed
Tazewell	Delevan	No detects-consultant to do site-centric notification
Tazewell	East Peoria	RTK Notification performed
Tazewell	South Pekin	No detects-consultant to do site-centric notification
Tazewell	Hiatts Hideaway Mobile Home Park	RTK Notification performed
Vermilion	Fairmount	RTK Notification performed
Vermilion	Valley Run Mobile Home Park	Under review
Whiteside	Morrison	RTK Notification performed
Will	Crest Hill	RTK Notification performed
Will	New Lenox	RTK Notification performed
Winnebago	Loves Park	RTK Notification performed
Winnebago	North Park Public Water District	RTK Notification performed
Winnebago	Six Oaks Mobile Home Park	RTK Notification performed
Woodford	Roanoke	RTK Notification performed

Section 4. Assist in the development and proposal of Right-to-Know cost recovery, well survey, and community relations work plan rules.

Illinois EPA completed these tasks and both sets of rules have been adopted by the Board. JCAR adopted the final regulations and rules on October 23, 2007. A detailed discussion of the well survey and community relations work plan regulations (Case Number R2006-023) can be found at the Board's Web site at <http://www.ipcb.state.il.us/COOL/external/casemenu.asp>.

Section 5. Assist with training Illinois Department of Public Health and local health department staff on Right-to-Know and use of the Internet geographic information system.

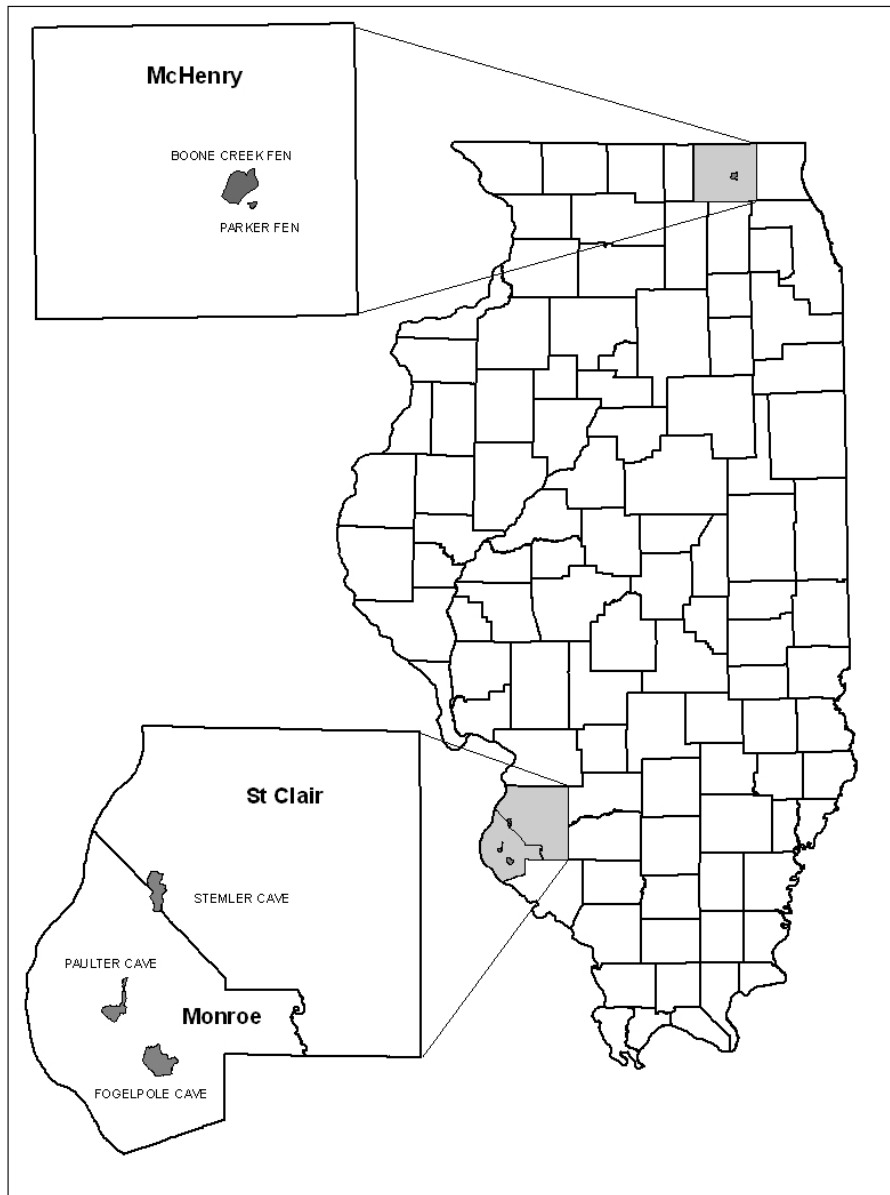
Illinois EPA conducted training sessions at the Kane County and Winnebago County Health Departments. Illinois EPA also developed a RTK and Internet GIS training CD that was distributed to local and regional health departments through IDPH.

**CHAPTER VI. GROUNDWATER QUALITY STANDARDS AND TECHNOLOGY
CONTROL REGULATIONS**

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

The Board's groundwater quality standards can be amended to designate Class III: Special Resource Groundwater. Further, the regulations provide for an expedited process of designating Class III areas contributing to dedicated nature preserves. Figure 8 illustrates the Class III areas established since 1991. During this two year period no new areas were designated.

Figure 8. Class III: Special Resource Groundwater for Dedicated Nature Preserves designations



Section 2: Continue to develop proposed groundwater quality standards for emerging contaminants of concern and contaminants detected in groundwater.

See emerging contaminants of concern discussion in Chapter IV, Section 7.

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

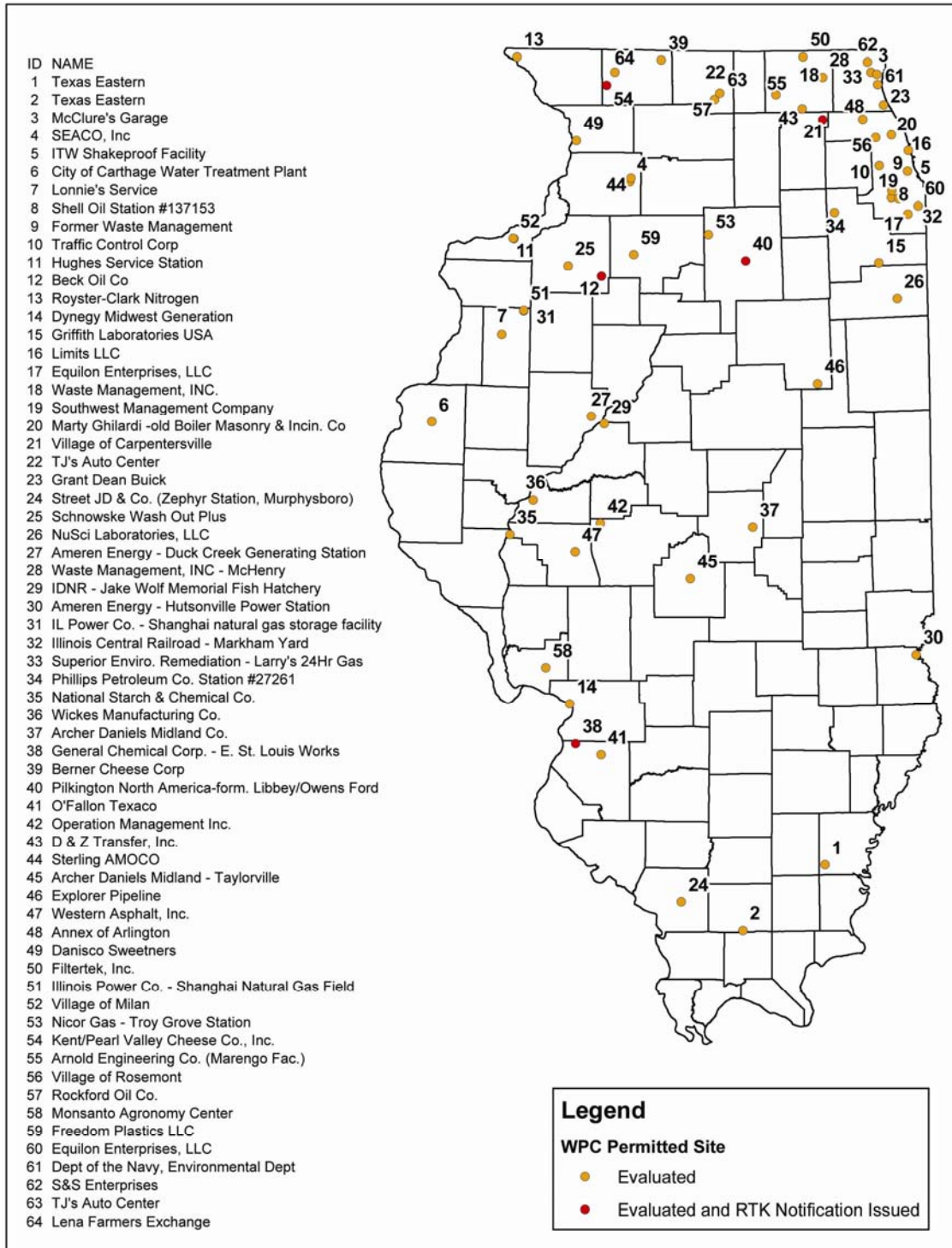
Groundwater quality standards compliance was evaluated at the following sites illustrated in Figure 9 with groundwater monitoring requirements under state water pollution control operating permits.

Existing groundwater data was compiled into a spreadsheet and is being entered into the Integrated Compliance

Information System. Requests were made of these sites to submit future data in an electronic format via electronic discharge monitoring report. Sites that represented a threat to off-site

groundwater and potential potable water supply wells were referred to Illinois EPA’s Contaminant Evaluation Group recommending notification to private well owners under the RTK law.

Figure 9. Division of Water Pollution Control permitted sites with groundwater monitoring requirements



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

In addition to the 39 proposed new groundwater quality standards, Illinois EPA (see discussion above under emerging contaminants) is proposing to amend the arsenic standard to be consistent with the new drinking water standard.

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

Significant public concern and national response to tritium leaks from nuclear power plants led to new radionuclide release reporting legislation and enforcement efforts focused on the protection of threatened beneficial uses. New release reporting regulations have also been developed and proposed to the Board. Additionally, a joint Illinois Emergency Management Agency/Department of Nuclear Safety and Illinois EPA quarterly inspection program has been initiated for these facilities. Further, extensive real-time leak detection monitors have been installed at blow down lines at Braidwood and Byron and extensive groundwater monitoring systems are in place at the other facilities.

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

Illinois EPA evaluated the following sites in conjunction with IGPA setback zones, technology control regulations, or groundwater quality standards violations:

Wayne Township Groundwater Contamination, DuPage County - Illinois EPA's BOL and BOW have conducted an ongoing investigation to determine source(s) of contamination of private drinking water system wells. DuPage County's private well monitoring program identified these private drinking water system wells contaminated with VOCs. Inspections, door-to-door surveys, geo-probing, and GIS analysis have been conducted. Further, coordination with the ISGS on down-hole geophysical surveys and well drilling were also done.

Greg Smith Salt Pile, McHenry County - This site involves a salt pile that existed on the Greg Smith property. The approximately 88-ton salt pile was located in the setback zone of a neighboring private well. It was stored on a gravel surface, allowing groundwater contamination to spread to down-gradient private wells. One private well had chloride concentrations in excess of 1,900 milligrams per liter (mg/l). The salt pile was removed in the spring of 2005. A Violation Notice was issued to Mr. Smith on September 12, 2005. Mr. Smith's proposed Compliance Commitment Agreement was rejected on November 9, 2005. The issue was then turned over to the Attorney General's office for action in 2006. Groundwater samples from the end of 2006 indicated chloride concentrations in the private well in excess of 700 mg/l.

McHenry Groundwater Contamination, McHenry County - Illinois EPA BOL and BOW have conducted door-to-door surveys, inspections, geologic cross-sections, groundwater flow modeling, and installed temporary monitoring wells to evaluate potential groundwater contamination sources relative to contaminated private drinking water system and public non-community water system wells. McHenry County Health Department conducted the non-CWS well sampling. Illinois EPA assisted with this most recent round of sampling.

Ramar Farms Potential Route, Marshall County - A damaged monitoring well created a potential route within the minimum setback zone of one of Henry's CWS wells. A Violation Notice was issued to the property owner. The monitoring well has been repaired and returned to compliance.

Road District 5 Salt Pile, Monroe County - The Road District stored de-icing agents in an open pile within the minimum setback zone of several private potable wells. Groundwater analyses indicated chloride total dissolved solids contamination in excess of the Class I standard in four of the private wells. A Violation Notice was issued to the Road District. The Road District has verbally committed to connecting affected properties to a CWS. The written commitment to make the connections was received in October 2007, and connections will be completed by February 2008.

BP Pipeline Company Hydrocarbon Release, Henderson County - Complaints of petroleum-type odors and a bad taste from water produced by a newly-constructed private well led to the collection of VOC and semi-volatile samples. Results indicated large concentrations of aliphatic hydrocarbons. A Violation Notice was issued to BP Pipeline Company because BP has the oldest pipeline that is located closest to the new private well. BP submitted a work plan, which was approved and implemented during the fall of 2007, to delineate the extent and source of the apparent release.

Hicks Oils/Hicks Gas Fuel Release, Tazewell County - Hicks obtained permits to pump, treat, and re-inject groundwater at the former bulk fuel storage facility. However, the source and extent of the groundwater contamination were not provided as part of the permitting process. Available data indicated free-phase hydrocarbons, and high concentrations of dissolved benzene existed on-site. Therefore, a Violation Notice was issued to Hicks to compel the company to provide more information and proceed with additional investigation as needed to determine the extent of contamination and the adequacy of the ongoing remedial activities. Hicks will be providing additional data for review and assessment before the end of 2007.

Buckeye Pipeline Gasoline Release, Macon County - Due to poor operational practices at the Harristown Pipeline Terminal, a valve leading to an open-ended pipe was opened allowing approximately 150,000 gallons of gasoline to flow into secondary containment berms and infiltrate into previously unknown field tiles beneath the storage area. The tiles discharged to surface water. A site investigation was initiated by Buckeye. Residual fuel from previous releases was also discovered. Buckeye installed an interceptor trench and removed contaminated soils and field tiles. Treated groundwater is being irrigated onto tank berms to facilitate flushing of residual fuels. This site has been referred to BOL for oversight.

Prince Agri Products Commercial Pesticide Storage, Adams County - A complaint regarding red staining on the grounds of a custom feed blender was referred by BOL to BOW due to the proximity of community wells. The staining was from iron supplement used in making feed. However, a site inspection by the Groundwater Section revealed pesticide mixing and storage areas located within the minimum setback zone of two community wells. The commercial pesticide operations consisted of blending, packaging, and storing pesticide used for fly spray. The operation had commenced within the minimum setback zones without first obtaining an exception from the Board. In addition, the operation had not been properly permitted by IDA. Illinois EPA issued a Violation Notice to Prince. Because the fly spray operation was incidental to Prince's main operation of feed blending, company personnel opted to cease operation of the fly spray packaging to come into compliance with the Act. Prince closed their pesticide operation pursuant to IDA regulations and demolished the mixing area. Prince is conducting post-closure monitoring pursuant to 35 Ill. Adm. Code 616.

Banner Day Camp Waste Water Spray Irrigation, Lake County - Upon review of data for a permit renewal, exceedences of the sulfate and total dissolved solids groundwater standards were noted. However, the groundwater monitoring system at Banner was not adequately designed to demonstrate if the spray irrigation site was the source of the contaminants, if there was another source, or if the concentrations were naturally occurring. Banner agreed to install additional wells and will continue groundwater monitoring.

Exelon Nuclear Plants at Braidwood, Byron, and Dresden - Tritium groundwater contamination incidents occurred at the Dresden, Braidwood, and Byron Exelon nuclear power generating facilities located in Grundy, Will, and Ogle Counties, respectively. Releases from the Braidwood facility garnered significant local and national attention. At Braidwood, multiple releases of waste water mixed with tritium released from leaking vacuum breaker vaults along a blow down line to the Kankakee River resulted in groundwater contamination. In addition, other underground piping carrying tritium also leaked and resulted in groundwater contamination at Braidwood. At Exelon's Dresden station, numerous leaks of tritium from underground piping resulted in groundwater contaminated with tritium. At Exelon's Byron Station, leaky breaker vaults along a blow down line resulted in groundwater contamination with tritium. An Interim Agreed-to Order was established to implement remediation at Braidwood. Negotiations with the Illinois Attorney General's Office are focused on including Braidwood, Byron, and Dresden under one consent decree.

Exelon Fleetwide Studies - Exelon initiated a comprehensive fleetwide study in 2006 to determine whether groundwater at and in the vicinity of all of its nuclear power generating facilities has been adversely impacted by any releases of radionuclides. This study provided a comprehensive analysis of the hydrogeologic conditions at each of its stations. Further, these studies delineated tritium groundwater contamination at Exelon's Zion generating station at Zion and its Quad Cities generating station at Cordova.

CHAPTER VII. WELLHEAD PROTECTION PROGRAM

Section 1. Continue the discussion with the Groundwater Advisory Council and other stakeholders regarding the integration of wellhead protection areas as a factor in the Tiered Approach for Corrective Action Objectives.

Illinois EPA has initiated discussions with the GAC and other stakeholders regarding the integration of WHPAs as a consideration in the TACO program. To date, efforts have focused on meeting with the SRAC and addressing two primary recommendations—document that a problem exists and peer review the WHPA modeling process and procedures. The ICCG developed a strategy to respond to the two SRAC recommendations. First, a paper was submitted to the National Ground Water Association that documented the increasing trend of VOCs occurring in CWS wells. Secondly, Illinois' wellhead protection area definition and modeling process was codified under Board regulations. Furthermore, a national dialog with other states was sponsored by the GWPC. This dialog determined that most states recognize WHPAs in risk-based remediation programs.

Section 2. Develop new Illinois EPA source water protection criteria and regulations.

Draft regulatory revisions were prepared, but are still under internal development. In addition, the American Water Works Association adopted a new source water protection standard that was published in September 2007. Illinois EPA has initiated discussion with the Illinois Section of the American Water Works Association on the most effective way to promote this new standard to CWSs in the state.

Section 3. Continue integration of Illinois EPA's Groundwater and Field Operation Sections' programs for providing technical assistance in source water protection and engineering evaluations (sanitary surveys).

Illinois EPA has made progress under this objective. A new database that integrates completed electronic engineering evaluations as a strategy for updating source water assessments has been developed but not fully implemented. Further, Illinois EPA's Groundwater Section staff is being cross-trained to conduct source assessments and sanitary surveys.

Section 4. Continue to publish wellhead protection and assessment data at <http://www.epa.state.il.us/water/groundwater/source-water-quality-progtam.html>.

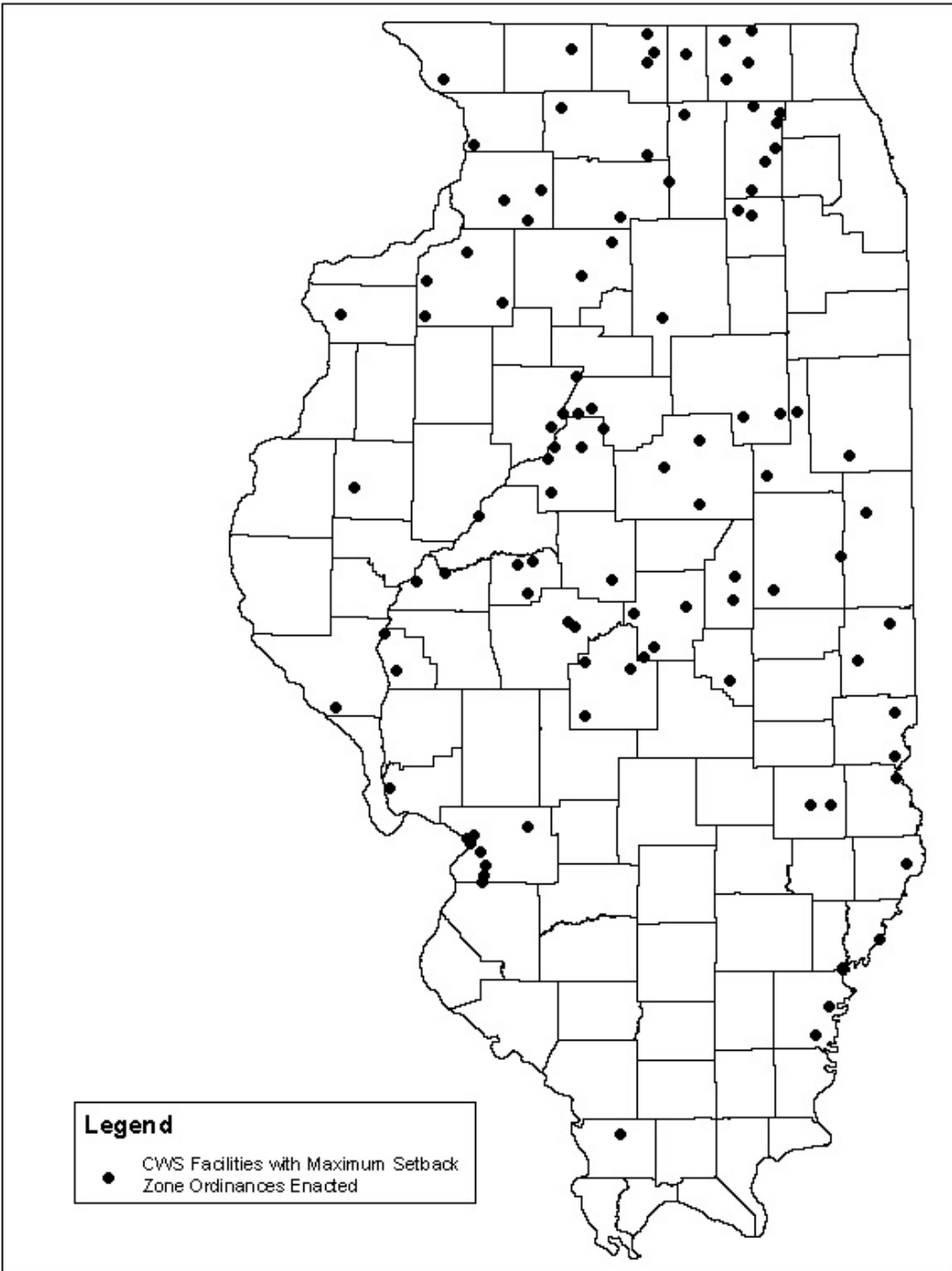
Illinois EPA continues to publish information regarding source water assessment and the Wellhead Protection Program (WHPP) under Illinois EPA's Environmental Facts Online link at <http://www.epa.state.il.us/enfo/>. Source water assessments have been completed and/or revised for 37 CWS and 260 non-community water supplies during this reporting period. In addition, inspections and surveys are being completed for an additional 30 non-community water supplies.

Section 5. Increase the percentage of intensive groundwater protection management for community water supply wells.

Groundwater protection management has not substantially increased within delineated WHPAs during this two-year period. Historically, CWSs such as Illinois American Water Company-Pekin and Pleasant Valley Public Water District have adopted a comprehensive overlay WHPA ordinance or requested that Illinois EPA propose a regulated recharge area. Additionally, in past years CWSs have adopted maximum setback zones as shown in Figure 10. Maximum setback zones are one of the tools used to expand protection in a WHPA. During this two-year reporting

period, the communities of Normal, Hebron, and Dawson have pursued adopting maximum setback zones for seven CWS wells. These results, combined with the increasing trend of VOC contamination, shows that the voluntary wellhead protection approach has reached a steady-state condition.

Figure 10. Community water supply facilities with adopted maximum setback zone ordinances



Section 6. Continue integration and implementation of the Wellhead Protection Program under the Safe Drinking Water Act alternative monitoring program.

Illinois EPA continues to encourage local WHPP management activities through incentives provided by the SDWA vulnerability waiver program. Under the WHPP, a WHPA is defined and the potential sources and routes 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. However, approved monitoring waivers are in decline due to an increasing trend of CWS wells with VOC detections. A total of 561 CWSs have implemented local WHPP elements and met the requirements for obtaining a partial monitoring waiver (either VOCs or SOCs). This total includes 489 CWSs that have implemented local WHPP elements and obtained a full monitoring waiver (both VOCs and SOCs). Further analysis indicates that a total of 671 treatment application points have a full monitoring waiver, and another 103 treatment application points have a partial monitoring waiver.

Section 7. Continue the delineation of recharge areas for community water supplies, using reasonably available information.

Historically, completion of these delineations has focused on CWS wells located within Illinois' priority groundwater protection planning regions and under vulnerability monitoring waiver programs as allowed by the SDWA to encourage groundwater protection program implementation. All unconfined supplies for which reasonably available data exists have completed delineations. The total number of facilities with completed delineations is 228 representing 867 wells. Further evaluation of available hydrogeologic data for other unconfined CWS wells is being conducted to determine the recharge area delineation potential for these supplies. New CWS wells continue to be evaluated. Illinois EPA has conducted groundwater modeling to delineate contributing recharge areas or WHPAs beyond applicable setback zones for five new CWSs, and 23 CWS WHPA delineations were updated during this two-year reporting period.

Section 8. Continue to modify community water supply well construction permit application procedures to include collection of information on potential sources and routes, well logs, pumping tests, and chemical analyses.

Draft revisions to the CWS well permit application forms and regulations have been developed, but not finalized. However, Illinois EPA continues to promote wellhead protection by providing 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 is to encourage CWSs to obtain the data needed to take proactive steps to protect their source of water. 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. The new well data will be used by Illinois EPA to delineate recharge areas and provide technical assistance for establishing maximum setback zones and other protection programs.

Section 9. Evaluate efforts to expand the Illinois Water Well Decommissioning Program.

The Illinois Water Well Decommissioning Program has been expanded to allow ten well sealing projects in each local soil and water conservation district and to permit the sealing of abandoned irrigation wells at a higher cost-share rate than cost-share for traditional well sealing projects. In addition, a special projects category has been adopted through IDA's Conservation 2000 Program

for cost-sharing high priority environmentally-friendly projects. This category provides an opportunity to fund well decommissioning projects beyond the statewide docket limit of ten well projects in each soil and water conservation district for Fiscal Year 2008.

Section 10. Promote the new Source Water Protection Plan Guidance.

An interactive CD entitled “*Guide to Developing a Source Water Protection Program in Illinois*” was developed with assistance from the Montana Water Center, through a grant from the Midwest Technology Assistance Center. The CD has been demonstrated at several professional water supply conferences and workshops, including those of the Illinois Section of the American Water Works Association, Illinois Potable Water Supply Operators Association, and the Illinois Rural Water Association. The training CD was designed so that water supply operators completing the guidance portion of the CD can earn up to 7.5 renewal education credit hours. In addition, the source water protection CD is posted on Illinois EPA’s Web site at <http://www.epa.state.il.us/water/groundwater/source-water-assessment/swap-flash/iswp.swf>.

CHAPTER VIII. REGIONAL GROUNDWATER PROTECTION PLANNING PROGRAM

Illinois EPA continues to work very closely with the regional priority groundwater protection planning committees to establish groundwater protection programs at the local level. Although each region has specific priorities and areas of concern, their general mission statements all have common goals and objectives.

Section 17.2 of the IGPA requires Illinois EPA to establish a regional groundwater protection planning program. Illinois EPA utilized recharge area mapping (completed in 1990 by DNR), groundwater pumpage data, population affected, water supply characteristics, solid waste planning efforts, and other factors to select the four existing priority groundwater protection planning regions (Figure 11).

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.

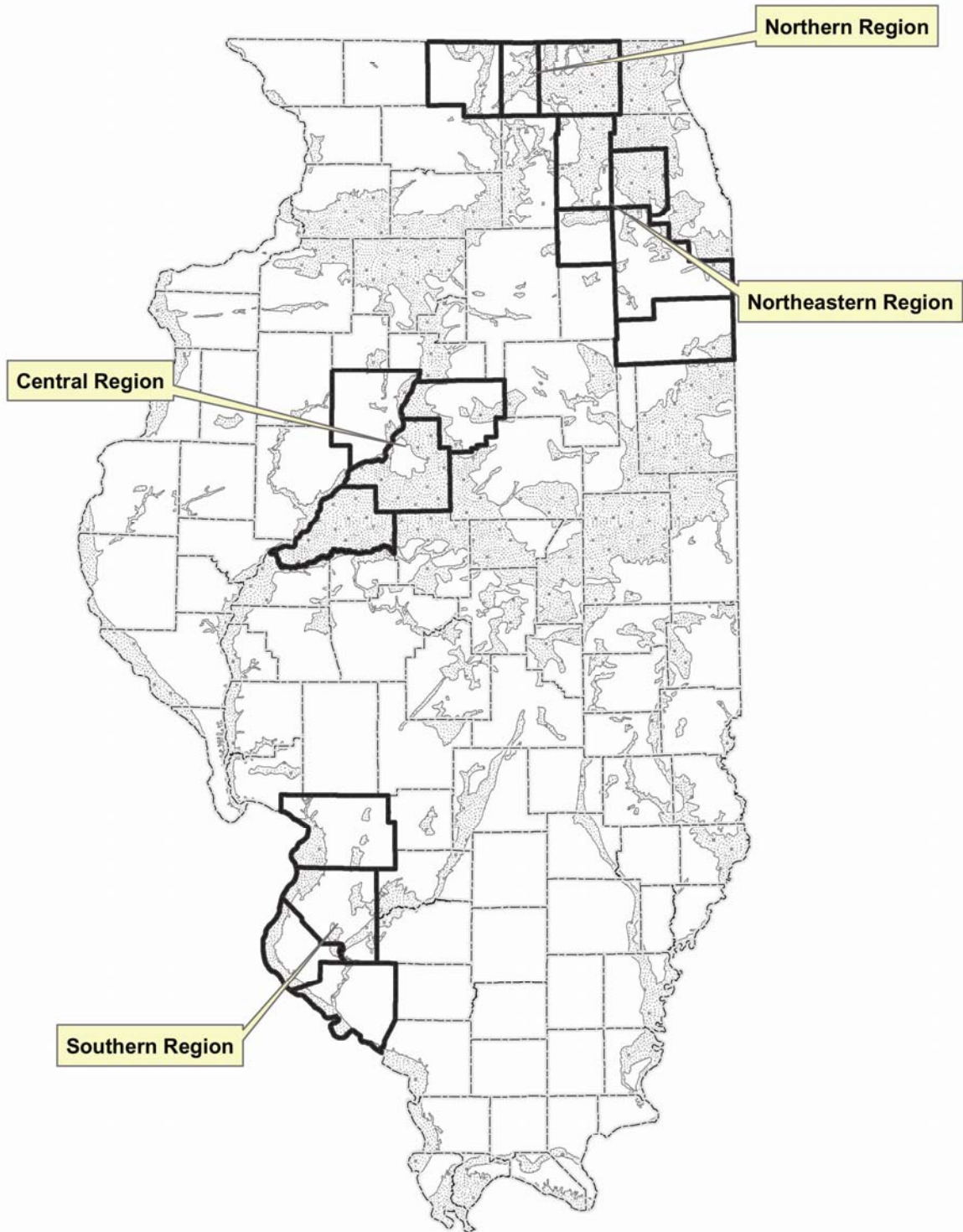
OBJECTIVES:

1. Maintain an ongoing 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 pollution prevention programs for businesses and residences located within groundwater recharge areas.
3. Work with county, municipal, and other special units of local government to implement groundwater protection tools such as local zoning, maximum setback zones, technology control regulations, and defining recharge areas.

A committee is appointed for each region by Illinois EPA's Director and includes a cross-section of representatives from the region including county and municipal officials, owners or operators of public water supplies which use groundwater, at least three members of the general public who have an interest in groundwater protection, and Illinois EPA and other state agencies, as appropriate.

The Northern and Central Groundwater Protection Planning Committees were first established in 1991, followed shortly thereafter by the Southern Groundwater Protection Committee in 1992. The Northeastern Groundwater Protection Planning Committee was initially appointed in 1995 and later amended to include DuPage County in 2001.

Figure 11. Priority groundwater protection planning regions



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. Most of the regional committees have 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.

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., pollution prevention interns, Groundwater Protection Field Days, well sealing demonstrations).

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 continues to promote the Groundwater Foundation's Groundwater Guardian Affiliate program. 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.

During the past two years, 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. The following information provides a summary of community outreach programs that the regional committees have targeted for groundwater protection efforts.

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

Northern Groundwater Protection Planning Region (Winnebago, Boone, and McHenry Counties) -

The Northern Groundwater Protection Planning Committee has assessed its efforts, and provides the following summary of these actions:

Loves Park Public Water District - For the fifth consecutive summer, the City of Loves Park and the Northern Committee collaborated on a well sealing program for residents in the five-year capture zone for Loves Park Public Water District Well #1. A student intern went door-to-door helping residents determine whether they had abandoned wells on their premises. Over 330 homes were visited, with 91 abandoned driven-point wells identified. A private well contractor and the

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.

Winnebago County Health Department sealed these 91 driven-point wells using materials available from the reduced-cost bentonite program developed through the Northern Committee. Over 215 abandoned wells have been properly sealed since the program began in 2002. Members of the Northern Committee are working with city officials in an effort to continue this program during the summer of 2008. The City of Loves Park in conjunction with the City of Rockford Park District plan to abandon about 36 private wells left inactive from a 2002 study. Loves Park is also working with the Winnebago County Health Department to get additional private well information added to their database. Additional wells were closed in Winnebago, Boone, and McHenry Counties for 15 private individuals through the same reduced-cost bentonite program.

McHenry County Groundwater Resources Management - The geology of McHenry County is made up of many sand and gravel, limestone, and sandstone formations. These aquifers serve as the source of all of McHenry County's drinking water. As the population grows, the demand for water is rising, the potential for contaminating aquifers increases, and wastewater disposal becomes more difficult. This combination of factors made it essential for McHenry County to develop a Groundwater Resources Management Plan that addresses the complete cycle of source, use, disposal, and reuse. Effective, economical options are being devised that reflect the needs of the interested public, municipalities, and officials of McHenry County. The plan was developed with the input of county and municipal officials, environmental groups, development-oriented organizations, interested businesses, citizens, and members of the Northern Committee in active discussions of the issues to ensure wide support. The plan is a useful tool for balancing supplies and demands and reducing the potential of groundwater contamination. The final plan was completed November 2006 and includes five sections: Groundwater Resources Management Framework, Groundwater Resources Information for Planning, Countywide Groundwater Protection Plan, Countywide Wastewater Management Plan, and Chlorides and Agricultural Chemicals: Problem Assessments & Corrective Action. More information may be found at <http://www.co.mchenry.il.us/common/countydpt/waterres/mgtplan.asp>.

McHenry County officials have made significant progress in their efforts to implement key components of the Groundwater Resources Management Plan. The county has hired a water resource manager to help unify and encourage municipalities to develop sensibly in an effort to minimize potential water shortages predicted in the 2006 report. The water resource manager has created a task force to evaluate county water issues, and a final report is expected by 2009. McHenry County will start planning for future water needs. McHenry County officials want to avoid a worst-case scenario of water rationing and dry faucets. Although the 120 million gallons per day that the county's aquifers can produce appear more than adequate to meet current needs, the availability of groundwater resources are limited in areas of the county predicted to have the greatest growth. Research has indicated that some of the more productive aquifers are located in rural areas and not in the county's more densely populated southeast corner. Some estimates contained within the plan predict that by 2030, Algonquin and Grafton Townships' water demands could far outstrip the supply. The plan concluded that if every municipality experienced the maximum growth allowed in their comprehensive plans, the daily water demand will jump to 164 million gallons, far exceeding what aquifers can provide.

Illinois Society of Professional Engineers Workshop - The Illinois Section of Professional Engineers held a workshop on January 16, 2007, at Aqua-Aerobics Systems. The Northern Committee along with Aqua-Aerobics Systems sponsored the workshop. The agenda included an update on Illinois EPA by Director Scott, Aqua-Aerobics Systems wastewater processes and

equipment, IDOT erosion control standards, groundwater and surface water ordinances, Natural Resources Conservation Service's Illinois Urban Manual, and the Northern Committee PowerPoint presentation.

Youth Groundwater Festival - The thirteenth annual Youth Groundwater Festival was held March 14, 2007, at Rock Valley College. Nearly 600 Winnebago County fourth and fifth grade students attended the festival. Donations from area municipal water departments, Winnebago County Health Department, Burpee Museum of Natural History, League of Women Voters, Retired Senior and Volunteer Services, a grant from the Rock Valley College Foundation, and the Northern Committee provided funding for the event. Approximately 90 people volunteered to help put on the Festival, including members of the Committee, area educators, two high school science departments, as well as environmental agencies and groups.

Water Table Management Structure - The Northern Committee helped support a water table management structure along with the Boone County Conservation District. The purpose for this project is to install a practice that will demonstrate the benefits of managing the shallow water table for crops, wildlife, increased groundwater recharge, and improved water quality. Recently the District had installed erosion control blankets, native seed plantings, and reshaped the bank. Due to recent flooding events, repairs need to be made to the tile outlet and culvert crossing. In addition, the native plant species need to be replanted to minimize erosion.

Chicago Metropolitan Agency for Planning - The Northern Committee members have participated and attended in several CMAP meetings. CMAP's purpose is to create a regional water supply planning group, develop water demand scenarios to 2050, evaluate management options, and conduct outreach and education. A summary of the regional water supply planning groups is provided in Chapter IV, Section 5.

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

Abandoned Well Sealing Program - The Northeastern Groundwater Protection Planning Committee has developed a well sealing program to promote and accelerate the proper abandonment of inactive water supply wells. Well abandonment guidelines and a tracking spreadsheet have been created to facilitate the implementation of this program. In addition, advertising brochures have been printed and distributed to each of the county health departments to assist in promoting this effort. Furthermore, the Committee has provided each county health department with up to \$300 to promote/publish the well sealing program or to offer free/reduced prices for a well sealing permit. The well sealing program involves the purchase of large amounts of bentonite, at a reduced cost, and providing it to private well owners at cost, or free of charge, to seal their well. Any monies collected are then used to purchase additional bentonite such that the program becomes self-supporting. The Committee also maintains an adequate inventory of bentonite at each county health department so that materials are readily available. The tracking spreadsheet provides minimal statistics to document the success of this program on a county-by-county level. To date, steady progress has been observed, and recent activities and management changes should help to further promote this program.

DuPage County Middle School Teacher Training Workshop - The Northeastern Committee assisted SCARCE (School and Community Assistance for Recycling and Composting Education) in development of a groundwater curriculum for DuPage County middle school teachers in

September 2006. A workshop was conducted by representatives of SCARCE with the assistance of Northeastern Committee members that provided training to middle school teachers in groundwater principles and teaching techniques. The participating teachers also received over \$250 worth of materials for teaching groundwater science in their classrooms including a tabletop groundwater flow model constructed to reflect the local hydrogeology.

Groundwater Education Lending Libraries - The Northeastern Committee continues their effort to refresh/purchase additional groundwater education materials to keep the lending libraries up to date. Currently, the two available lending libraries that the Committee has are housed at the Kendall County Health Department. The Committee is in the process of evaluating different outreach methods to inform middle school teachers and the public about the availability of these lending libraries. Members of the committee are also in the process of developing an inventory of the groundwater education materials to provide to the press and other media outreach mechanisms, list in monthly newsletters, and feature in public service announcements.

Will County Groundwater Field Day - The Northeastern Committee, the Will County Health Department, and the City of Joliet sponsored and conducted a groundwater field day for Will County water professionals on April 27, 2006, at Billie Limacher Bicentennial Park Theatre, Joliet, Illinois. The agenda for the field day included presentations on gravel well replacement, radium removal techniques, and hydrous manganese oxide pilot testing and operations. Additional speakers included Dennis Duffield, Joliet's former public works and utilities director, who discussed improvements made to the current water system, adding additional capacity, water treatment methods for radium removal, and planning for future challenges. The final presenter was Bon Mui, Joliet's capital program engineer, who discussed current water system operations and improvements to the booster stations under the current capital program. Training renewal credits were provided to both Licensed Environmental Health Practitioners (LEHPs) and water supply operators that attended the workshop. This workshop was the second time that the Committee has been able to offer training renewal credits for water supply operators and the first time for LEHPs.

Kendall County Groundwater Field Day - The Northeastern Committee hosted a groundwater protection field day entitled "Groundwater Management in Kendall County" held at the Kendall County Health Department on May 24, 2007. Training renewal credits were again provided to both LEHPs and water supply operators that attended. Agenda items included: "An Update on Regional Groundwater Resource Investigations in Northeastern Illinois" by Allen Wehrmann, ISWS; "IDPH Water Well Program Updates" presentation by Bob Cowles, IDPH; "Water Well Systems and Components" by Steve Liberg, Prairie State Water Systems and Sue Bohentengel, Executive Director, Illinois Association of Groundwater Professionals; "Staying Ahead of the Water Demand Curve - United City of Yorkville Water Works System Expansion" by Jeff Freeman, Project Engineer, Engineering Enterprises; and a tour of Grand Reserve water treatment plant provided by Brian Sorensen from the Yorkville public works department. Other speakers included Daniel Horvath from Resource Consulting, and Chair of the Northeastern Committee, who spoke about the Committee and the resources they have available to the region, and Steve Curatti, Kendall County Health Department, who gave statistical data on groundwater resources and growth within Kendall County. Positive feedback was obtained through participant surveys that were collected after the event.

Groundwater Research Student Grant Program - In September 2006 the Northeastern Committee awarded its first student research grant to Heidi Kelly of Northern Illinois University. Ms. Kelly's research involved an evaluation of the biodegradation of atrazine in groundwater in Kane County.

As a requirement of the student research grant, a presentation of her findings was provided to the committee in May 2007 by her advisor, Dr. Melissa Lenczewski. Additional grants to students whose research area or residence is within the five-county priority groundwater region will be provided by the Committee as a continuing contribution to the region and the state.

Kane County Water Resources Study - The Kane County Water Resources Study was initiated in 2002 by using the services and expertise of the ISWS and the ISGS. The planned five-year study consists of the development of a conceptual model of the geology and hydrogeology of Kane County, the compilation of a comprehensive database of digital geologic and hydrogeologic information for the county, the design of a three-dimensional numerical model of the aquifers below the county, and the creation of detailed geologic maps and cross-sections of the subsurface geology of the county. This information will be used for planning and management purposes upon the completion of the study in late 2007 and early 2008. Significant progress has been achieved in understanding the complex nature of the groundwater resources of the county. Members of the Northeastern Committee and the communities of Kane County are participating in the study through review of monthly study updates provided by the ISWS and ISGS as well as attendance at biannual update meetings. Through this participation, the communities of Kane County provide input to the study, inquire as to the status of the various aspects of the study, and provide updates on water supply planning, development, and management activities in the county to the researchers for inclusion in the study. A summary of the Kane County water resources study is provided in Chapter IV, Section 5.

Kendall County Groundwater Study - The ISGS and ISWS are conducting a scientific study of the geology and groundwater resources of Kendall County, Illinois. The project, contracted by the county and many local communities, has been under way since June 2005. The purpose of the study is to provide technical information and support for the sustainable management and protection of the county's groundwater. The scientists are especially interested in evaluating the groundwater's long-term availability and sensitivity to contamination. As part of its study objectives, the ISGS has conducted sediment sampling throughout the county, collected surface geophysical profiles, and drilled and installed observation wells in key areas of Kendall County. The preliminary results of the study were presented to members of the Committee in May 2007. The final report is expected to be completed early in 2008. Municipal officials and other county stakeholders anxiously await the completion of this study to better make sound resource decisions as the growth in the region continues.

Northeast Regional Water Supply Planning Group - To consider the future water supply needs of Northeastern Illinois and develop plans and programs to guide future use that provide adequate and affordable water for all users, including support for economic development, agriculture and the protection of our natural ecosystems, a regional water supply planning group was formed in 2006. The Northeastern Committee continues to monitor the workings of the planning group and assist with its efforts to quantify future regional water demand and to determine the proper courses of action to ensure the viability of the region's water resources. A summary of the regional water supply planning groups is provided in Chapter IV, Section 5.

Northeastern Committee Member Receives Governor's PATH Award - Northeastern Committee member Ann Muniz of Downers Grove was honored with the Governor's PATH (People Are Today's Heroes) Award for her outstanding work to increase awareness of threats to groundwater supplies. Mrs. Muniz was a community advocate in responding to widespread contamination of private wells in parts of DuPage County and assisted Illinois EPA in implementing the RTK law

that requires increased notification and community outreach when companies cause off-site contamination impacting private wells and other environmental hazards.

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

Groundwater Protection Program Video(s) and Teacher Curriculum - In an effort to promote groundwater protection, education, and awareness, the Central Committee's Education Subcommittee developed a curriculum for teaching fourth- through eighth-grade students about the importance of groundwater as a natural resource. The curriculum materials (i.e., PowerPoint presentation, text, and sample quiz) allow teachers the ability to modify and use, at their own discretion, to allow for different teaching methods. As part of the curriculum materials, the Central Committee has developed and produced four videos that may be presented in their entirety or in segments to accommodate class time restraints. Most recently, all four videos have been copied onto DVDs that are available from the Tazewell County Health Department.

2006 and 2007 Clean Water Celebration - The Clean Water Celebration, held in Peoria, incorporates a variety of programs for students, teachers, and the public, with over 3000 attendees. Exhibits included information on riverbank erosion and stabilization, water treatment, wildlife of the wetlands, aquatic life, recycling, improving water quality, and natural resource conservation and management. Committee members staffed a booth on behalf of the Tazewell County Health Department, providing information on how citizens can help safeguard the water resources and educating on the environmental impacts of litter and pollution. In addition, the "Spirit of Peoria" riverboat was rented by a private sponsor, serving as a platform for an educational trip on the Illinois River. Nicknamed the "Floating Classroom," in 2007 the students and public examined educational stations, including a creative writing session with Tim Smith, author of the Buck Wilder series, a presentation by Prairie Folklore Theatre, and hands-on stations from local birdwatchers, artists, and water scientists who explored and discussed the Illinois River. The Committee continues to support the event by serving on the navigating committee, staffing learning sessions, and providing financial support to help defray transportation expenses for participating school districts.

Test Your Well Days - "Test Your Well Day" invites private well owners to collect and bring samples of their well water to be tested, at no charge, for the presence of nitrates. Events are often held in the evening, Saturday mornings, or combined with another event. Students, Girl Scouts, and other volunteers administer the tests using water quality test strips. Groundwater samples determined to have elevated levels of nitrate are then re-sampled and sent to a certified laboratory for a more accurate assessment. Utilizing community volunteers who offer valuable service in a non-threatening atmosphere is an innovative aspect of the "Test Your Well Day" concept. These events also provide well owners with educational material about groundwater protection, nonpoint source pollution, the importance of water quality, and pollution prevention practices. In addition, volunteers learn about the importance of environmental health and better understand their roles in safeguarding drinking water quality.

Pesticide Screening Program - The Central Committee screens for the occurrence of pesticides in private well water. The program targets farmers and rural homeowners who live in areas that are predominately agricultural land. The screening program is conducted twice a year—when farmers are planting and fertilizing and then again during the harvest season. Private well water samples

are screened for atrazine. Atrazine is a herbicide used in the control of grasses and broadleaf weeds in row crops. Over the last two years the screening has had no samples that have exceeded 3 ppb, which is the maximum contaminant level (MCL) and Class I groundwater standard for atrazine. The use of atrazine within the central region is declining, as Roundup is becoming the herbicide of choice. Another atrazine screening will occur in spring of 2008, at which time the Committee will decide whether to offer this screening again. The Tazewell County Health Department runs the test and gathers and stores the results for the Central Committee.

East Central Illinois Regional Water Supply Planning Committee - While Illinois has significant sources of both groundwater and surface water, the growing state population and increasing demand for water is expected to strain current resources. As described in Chapter IV, Section 5 of this report, Executive Order #1-2006 requires the development of a comprehensive, statewide water supply planning and management strategy. The state began by selecting two areas most at risk for water shortages and conflicts, one of which is the Mahomet Aquifer, spanning central and east-central Illinois. The Mahomet Aquifer planning area includes Vermilion, Iroquois, Ford, Champaign, McLean, Macon, DeWitt, Piatt, Woodford, Tazewell, Mason, Logan, Menard, Cass, and Sangamon Counties. Three of these counties—Woodford, Tazewell, and Mason—are located within the Central Committee’s priority planning region. To implement the requirements of Executive Order #1-2006, the MAC started a three-year regional water supply planning process with a funding grant from DNR. The first task was to convene the East Central Illinois Regional Water Supply Committee. This local planning committee has been established and will assist in the collection and evaluation of the hydrologic data needed to draft the regional water supply plan. This data will include figures such as total usable amount of groundwater and surface water in the planning area and projected water supply and demand scenarios. A representative from the Central Committee has been appointed to the East Central Illinois Regional Water Supply Committee and regularly provides updates to the Central Committee members.

The primary objectives and activities of the East Central Illinois Regional Water Supply Committee are to:

- Utilize water resource research findings by the state surveys;
- Develop water demand scenarios to year 2050;
- Evaluate water supply and demand management options as potential implementation of such options might benefit the citizens of east central Illinois;
- Create a regional water supply plan that reflects a newly developed understanding of water availability given research findings on supplies and demand scenarios and plans for growth, development, and land use change; and
- Propose and support outreach and public education activities.

Central Committee Member Honored by Illinois EPA Director - Bill Compton, the long-time chair of the Central Groundwater Protection Planning Committee, was the first honoree of the newly-created Illinois EPA’s “Bill Compton Corporate Environmental Stewardship Award.” Mr. Compton has been a leader from the business sector in groundwater protection efforts, has served on and chaired the Governor’s Groundwater Advisory Council since 1997, and chaired the Water Quantity Planning Subcommittee and the Right-to-Know Notification Methods Subcommittee. He has also worked on the local and regional level to protect groundwater, including chairing the Pekin wellhead protection ordinance team, chairing the Central Illinois Groundwater Protection

Planning Committee, and serving as trustee and chairman of the Groveland Township public water supply, and on the Tazewell County Groundwater Protection Committee.

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

Well Sealing Campaign - The Southern Committee has continued purchasing bentonite to assist in the sealing of private water wells in conjunction with the Water Well Abandonment Program launched by IDA and the Madison County Soil and Water Conservation District. The well sealing materials are provided at no cost to program participants in the four-county region. There is an emphasis placed on the abandoned wells located within the immediate proximity of a community water supply well. In addition, the use of the bentonite is also available for sinkhole stabilization projects, which in turn benefit both surface and groundwater quality within portions of the karst-terrain area of southwestern Illinois.

Well Screening Effort - The Southern Committee purchased immunoassay kits to test for the occurrence of pesticides in private well water. The program targets farmers and rural homeowners that live in areas that are predominately agricultural land. The program is biannual and occurs in the fall and spring to coincide with the time farmers are planting and fertilizing. Private well water samples will be screened for triazines (of which atrazine is a common form) using immunoassay-testing methods. Atrazine is a common herbicide used in the control of grasses and broadleaf weeds in crops. It is anticipated that testing for nitrate, coliform, and the preceding pesticides will give most homeowners the ability to know more about their source of drinking water. In addition, the Madison County Health Department laboratory conducts all screenings, and the Southern Committee is collating the results for review and use for future educational planning efforts.

Water Stewardship Project - For the fourth consecutive year, the Southern Committee has co-sponsored a Water Stewardship Festival. This year's event was held on April 27, 2007, and involved 35 fifth-grade teachers and more than 1,000 fifth-grade students at Lewis and Clark Community College in Godfrey, Illinois. This was preceded by an April 23, 2007, teacher-training workshop that helped prepare the teachers to facilitate the information of the project. The objectives of the event were to promote general knowledge about water ecology and environmental education, inform students and educators about resources available at the state and regional levels which support clean water, educate students about the science of water quality and water ecology, and promote knowledge about the relationship of water quality and health.

Groundwater Protection Field Day - On May 24, 2007, over 50 participants attended a groundwater protection field day at the Southern Illinois University-Edwardsville Environmental Resource Training Center in Madison County. The field day focused on groundwater protection, with specific emphasis placed on abandonment of wells not actively being used. This event provided an overview of the current local initiatives to protect groundwater by educating the public of the potential problems associated with wells that are in disrepair. These issues include both groundwater contamination and physical injury due to an open hole. The event was capped with the sealing of water well by a licensed water well driller.

Groundwater Lending Library - The Southern Committee has an ongoing goal of encouraging local stakeholders to become more aware of and active in groundwater protection strategies throughout the southern region. To this end, an informational campaign continues to collect and develop materials regarding groundwater protection and education programs to be utilized by

various governmental and local agencies. As part of the lending library, the Committee has incorporated a display board that can be used by members and loaned to various local agencies to support groundwater protection/educational outreach efforts at area conferences, community functions, and county fairs.

The Southern Committee Networking Survey - The Southern Committee determined a need for a networking survey that would be used as a “who-to-call” directory. The survey is a collection of names, employers, and job titles for all the current members and advisors of the Southern Committee. This directory was provided to Committee members so that they would be able to utilize the directory to find the best resource or person to address these issues.

CHAPTER IX. NON-COMMUNITY AND PRIVATE WELL PROGRAM

Section 1. Continue to implement the Wellhead Protection Program and assist with implementing the technology control and groundwater quality standards regulations.

IDPH has primary responsibility for inspections of approximately 4,218 non-community public water systems (NCPWSs), which are performed at least once every two years. The NCPWSs in Illinois serve a population of approximately 528,084 citizens. These are water systems that serve 25 or more people for at least 60 days per year, for example, schools, restaurants, factories, power generating stations, office buildings, campgrounds, state parks, and rest stops.

At the time of the inspection of a NCPWS, IDPH and local health departments inspect the area surrounding the wellhead 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 non-community public water systems.

As required by amendments to the SDWA, IDPH has essentially completed source water assessments of all NCPWSs and will continue these assessments for all new NCPWSs. Approximately 3,600 water supply wells and 16 surface water sources serve as the sources of water to these systems. These wells and surface water sources were identified and evaluated for 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, which was amended to a 1,000-foot radius. NCPWS well locations were digitized from registered aerial photographs and then converted into a GIS coverage. During the field survey for the well, potential sources of contamination within 1,000 feet are identified and drafted onto the photograph. Each site is described on a standardized coding form and is then entered into Illinois EPA's new Proteus database.

This project brought together resources from the Illinois Department of Transportation, Illinois EPA, IDPH, and local health departments. Illinois Department of Transportation provided aerial photographic maps of the area surrounding each supply, and Illinois EPA entered the data into a GIS data system. This project began in 1998 and took three years to assess supplies that were listed as active at that time. Local health departments were compensated from federal funding through U.S. EPA for conducting the assessments. IDPH regional staff conducted assessments at IDPH-licensed supplies for those located in counties without local health departments. IDPH utilized the source water assessment data to write a susceptibility assessment for each supply, taking into consideration land use, previous sampling data, and geological data. IDPH submitted copies of completed assessments reports to Illinois EPA and the water supply. Currently, source water assessments are being completed for 168 NCPWSs that have become active since January 1, 2006.

Section 3. Continue geographic information system coverage for all new non-community public water systems.

The digitizing of all existing NCPWS wells has been completed. This was accomplished by taking aerial photographs, which have been drafted with well locations 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. The process of digitizing all new NCPWS wells will continue.

Section 4. Continue certification training of non-transient, non-community public water systems 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 completed IDPH-approved training. Approximately 400 non-transient NCPWSs currently require certified operators. These operators must be initially certified and re-certified every three years by attending IDPH-approved training classes that address new technology and new drinking water regulations.

During 2006 and 2007, the Water Quality Association offered six classes for operator certification. Since the onset of these classes, 1,164 individuals have become IDPH-certified operators. Currently, 48 operators are certified through Illinois EPA, which allows them to operate non-transient NCPWSs. IDPH reimburses eligible operators for costs associated with taking these classes through a grant from U.S. EPA. The grant, which was originally awarded in 2001 and extended through 2007, will terminate in September 2009.

In late 2005, IDPH selected the Operators Basics program, developed by the Montana Water Center in cooperation with Illinois EPA, as the renewal course. Operators can complete this course online or order the CD version from the National Environmental Services Center. Approximately 904 operators have successfully completed the required training and have renewed their certifications.

Section 5. Continue to inspect and perform laboratory analyses on water samples collected from non-community public water systems.

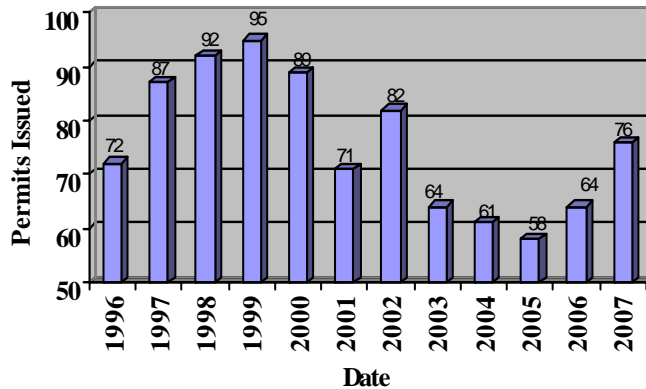
The IDPH continues to inspect and monitor NCPWSs. As part of these evaluations, the systems under IDPH regulatory authority are continually evaluated for water quality concerns and potential sources of contamination within their respective wellhead protection areas. To date, the IDPH has authority over 4,218 NCPWSs of which 400 are classified as non-transient (those systems that serve at least 25 of the same individuals at least six months of the year).

While monitoring varies depending upon population and system type (transient or non-transient), all of these systems are routinely evaluated for bacteria and nitrate contamination. Furthermore, non-transient NCPWSs, like schools and workplaces, must monitor for an additional 70 contaminants including VOCs, SOCs, and IOCs.

Section 6. Continue to issue permits for the construction, modification, or extension of existing non-community public water systems.

During 2006 and 2007, IDPH issued 64 and 76 permits, respectively, for the construction, modification, or an extension of an existing NCPWS. Since 1996, the number of permits issued increased annually and peaked during 1999 (Figure 12). From 2000 through 2005, there was a gradual decline with one anomaly in 2002. In 2006 and 2007 the trend is increasing again.

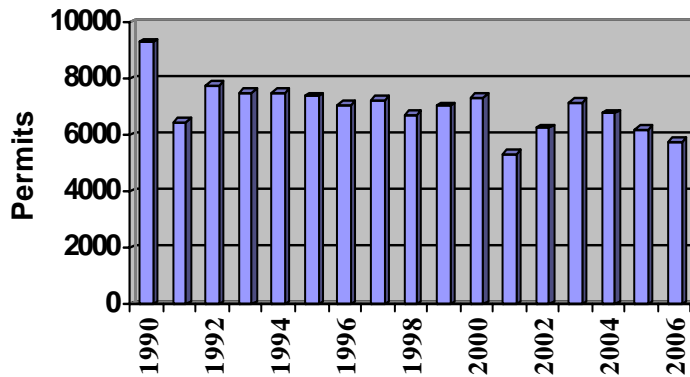
Figure 12. Permits issued to construct, alter, or extend a non-community public water system



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

During 2006 and 2007, IDPH and local health departments issued approximately 12,000 permits to construct private, semi-private, non-community, and non-potable water wells. Figure 13 illustrates the number of water wells permitted during 1990 through 2006. Since 2003, the number of well permits issued has steadily declined. 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 analyzed by certified laboratories for the presence of coliform bacteria and nitrate concentration.

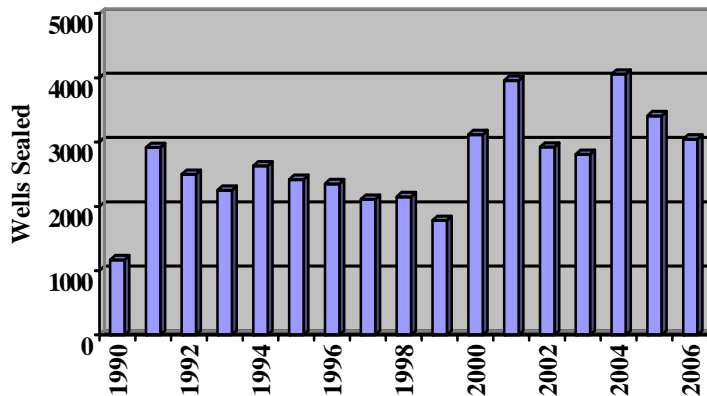
Figure 13. Water well construction permits issued



During 2005 and 2006, well sealing records reveal that approximately 3,500 and 3,000 abandoned wells were sealed, respectively. Even though this represents a decline following 2003 and 2004, the number of wells sealed during 2005 and 2006 still falls within the five highest years 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 14 illustrates the number of water wells sealed during 1990 through 2006.

Figure 14. Water wells sealed



Section 8. Continue to update the Illinois Water Well Construction and Pump Installation Codes to reflect new technology, industry, and public health standards.

The proposed amendments would clarify the requirements for grouting drilled wells and sealing abandoned wells, establish requirements for bored well construction materials, update and clarify the requirements for constructing closed-loop heat pump wells, and clarify the setback requirements between closed-loop wells, water wells, and sources of contamination. This would ensure that the installation of closed-loop wells meet state groundwater protection and public health standards.

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

The Water Well and Pump Installation Contractor’s License Act requires all licensed water well and pump installation contractors to attend a six-hour continuing education session every two years. In order to renew a license, a contractor must provide proof of attending such training, such as a certificate from the organization that sponsored the training.

Plumbers who install or repair water well pumps and pumping equipment must be licensed as water well pump installation contractors, but they are not required to take the water well pump installation contractor's license examination or to pay the license fee. However, they are required to attend a six-hour continuing education session every two years.

IDPH-approved training sessions 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 sessions included Illinois geology, on the job safety training, water well pumping system design, well abandonment, water well evaluations, JULIE, business accounting, water well pumps and tanks, ground source heat pump installation, constant pressure pumping systems, applications for variable speed pumps, well drilling rig maintenance, groundwater science, and groundwater contamination and remediation. Approximately 827 water well and water well pump installation contractors licensed by IDPH are required to attend these training sessions. Eleven training sessions were held throughout the state during 2006 and 2007. Nearly all of the sessions were conducted through the IAGP.

Section 10. Continue to conduct training sessions pertaining to both the non-community public water system and private water programs for local health department and IDPH water program staff.

Water program staff from IDPH and 96 local health departments attended 41 water program training sessions throughout the state. Eleven of the sessions coincided with the above sessions for licensed water well and pump installation contractors. The IAGP provided a field demonstration pertaining to abandoned wells as threats to groundwater contamination and proper methods to seal them. As part of its education conferences, the Illinois Environmental Health Association sponsored seven sessions with topics pertaining to ground source heat pump systems, plumbing cross connections, resolving well problems, water consumption, arsenic in water, and applications of the down-hole video well camera. IDPH, the regional groundwater protection planning committees, Illinois Groundwater Association, and local health departments sponsored the remaining training sessions with topics pertaining to inspecting NCPWSs and other topics previously approved by IDPH. The sessions met 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).

Section 11. Continue implementation of public notification for private water supply potential contamination.

Amendments made in 2002 to the IGPA require Illinois EPA to notify IDPH of the discovery of a VOC in excess of the MCL. Within 60 days of this notice, IDPH, in coordination with the local health department, shall notify the owner of any private, semi-private, or NCPWS within a potentially affected area of concern of the need to test the water system for possible contamination. The notice shall be published for three consecutive weeks by means of local media. Illinois EPA must notify the unit of local government affected to take any appropriate action, such as informing any homeowner who potentially could be adversely affected, within a reasonable time after notification by Illinois EPA.

Upon receipt of notification from Illinois EPA of the discovery of a VOC in excess of the MCL or a groundwater standard in a particular area, IDPH notifies the appropriate local health department in writing. The notification explains the legal background for the requirement to provide notification of actual or potential contamination as specified through Section 9.1 of the IGPA. In this notice, IDPH requests the local health department to notify any owners of private or semi-private water systems within the potentially affected area that a VOC in excess of standards has been detected and of the need for owners to test their water systems for possible contamination. The public notice must be made within 30 days after informing the local health department of the contamination.

The essential elements of the public notice include:

- Identify the contaminant(s) of concern;
- Delineate the area of contamination based on the information provided by Illinois EPA. This can be accomplished by one of several methods, e.g., specifying the area of a contamination plume or listing the public roads encompassing the area of contamination;
- Inform the water system owner of the need to test the system for possible contamination;
- State that a list of certified laboratories is available upon request;
- State that fact sheets pertaining to the contaminant are available upon request; and

- Provide IDPH or local health department's contact person.

From July of 2002 through October of 2007, IDPH and local health departments processed 38 public notices of such contamination.

Section 12. Continue implementation of the Safe Drinking Water Information System for compliance monitoring of non-community water systems.

IDPH contracted with the company that developed the Safe Drinking Water Information System (SDWIS) to convert and migrate Illinois EPA's old database. IDPH began using SDWIS as its sole database and uploaded historical data in late 2004. Since then, all new inventory, sampling, and violation data has been entered into this system.

CHAPTER X. GROUNDWATER QUALITY PROTECTION RECOMMENDATIONS AND FUTURE DIRECTIONS

The following groundwater protection efforts are recommended for the next two years (2008 and 2009) 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 following recommendations are organized by the results provided above.

Interagency Coordinating Committee on Groundwater Operations

- Continue to review and update the Implementation Plan and Regulatory Agenda.
- Work with the Groundwater Advisory Council and regional groundwater protection committees to sponsor a Groundwater Protection Policy Forum.
- Assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.
- Continue the policy discussion regarding prevention versus remediation.
- Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives. The Site Remediation Advisory Committee recommended that a problem be documented and that the wellhead protection area modeling process be peer reviewed.
- Establish a subcommittee led by Illinois Department of Public Health to discuss tracking and registering groundwater monitoring wells.
- Establish a subcommittee to discuss registering closed-loop heat pump wells and licensing drillers.

Groundwater Advisory Council Operations

- Conduct policy-related meetings in order to review and make recommendations regarding groundwater issues and policies.
- Provide input to programs, plans, regulatory proposals, and reports as appropriate.

Education Program for Groundwater Protection

- Market the new source water protection standards.
- Initiate efforts to fill critical vacancies.

Groundwater Evaluation Program

- Continue to conduct a program of basic and applied groundwater research programs that allow decisions to be made on sound scientific principles.
- Strive to implement monitoring for emerging contaminants.

Right-to-Know Initiatives

- Continue efforts of providing notification for off-site potable resource groundwater users threatened by degradation of their beneficial uses.

Groundwater Quality Regulations

- Continue with proposed changes to the groundwater quality standards and continue efforts of protecting future beneficial uses of drinking water.

Wellhead Protection Program

- Amend rules to require the development of source water protection planning (unless already developed) considering the current state of the art.
- Implement principles developed under the national Source Water Protection Collaborative (e.g., “Marketing for Change”) as part of outreach efforts.

Regional Groundwater Protection Planning Program

- Continue to assist and advocate local groundwater protection, education, and marketing.

Non-Community and Private Well Program

- Continue to implement the Wellhead Protection Program and assist with implementing the technology control and groundwater quality standards regulations.
- Continue the source water assessments for new non-community public water supplies.
- Continue certification training of non-transient, non-community public water supply operators.
- Continue to inspect and perform laboratory analyses on water samples collected from non-community public water supplies.
- Continue to issue permits for the construction, modification or extension of existing non-community public water supplies.
- Continue the issuance of permits for all types of water wells with the exception of community water supply wells.
- Continue to update the Illinois Water Well and Pump Installation Codes to reflect new technology, industry, and public health standards.
- Continue supporting education training sessions for licensed water well and pump installation contractors.
- Continue to conduct training sessions pertaining to both the non-community public water supplies and private-water program for local health department and the Illinois Department of Public Health water program staff.
- Continue to completely implement the Safe Drinking Water Information System database for compliance monitoring of non-community public water supplies.
- Continue the implementation of Public Notification for Private Water Supply Potential Contamination.

Appendix I. References Cited by the Illinois Department of Agriculture

- Goetsch, W.D., T.J. Bicki, and D.P. McKenna, 1992. Statewide Survey for Agricultural Chemicals in Rural, Private Water-Supply Wells in Illinois. Illinois Department of Agriculture, Springfield, Illinois, p. 4.
- Illinois Department of Agriculture, 2000. Illinois Generic Management Plan for Pesticides in Groundwater. Springfield, Illinois, p. 39.
- Keefer, D.A., 1995a. Potential for agricultural chemical contamination of aquifers in Illinois [revision]. Illinois State Geological Survey Environmental Geology 148, p. 28.
- Mehnert, E., D.A. Keefer, W.S. Dey, H.A. Wehrmann, S.D. Wilson, and C. Ray, University of Hawaii, June 29, 2001. Illinois Statewide Monitoring Well Network for Pesticides in Shallow Groundwater - Network Development and Initial Sampling Results. Draft Final Contract Report, p. 55.
- Schock, S.C., E. Mehnert, M.E. Caughey, G.B. Dreher, W.S. Dey, S. Wilson, C. Ray, S.F.J. Chou, J. Valkenburg, J.M. Gosar, J.R. Karny, M.L. Barnhardt, W.F. Black, M.R. Brown, and V.J. Garcia, 1992. Pilot Study: Agricultural chemicals in rural, private wells in Illinois. Illinois State Geological Survey and Illinois State Water Survey Cooperative Groundwater Report 14, p. 80.

Appendix II. Groundwater and Related Publications by the Illinois State Geological Survey and Illinois State Water Survey for 2006 and 2007

For a complete list of ISGS publications, see <http://www.isgs.uiuc.edu/isgshome/pubs-prod.htm>.

To search for ISWS publications, see <http://www.sws.uiuc.edu/pubs/isearch.asp>.

ISGS Groundwater and Related Publications for 2006 and 2007

Abert, C.C., W.S. Dey, A.M. Davis, and B.B. Curry, 2007. Three-Dimensional Geologic Model, Kane County, Illinois. Illinois State Geological Survey, Illinois County Geologic Map, ICGM Kane-3D.

Curry, B.B., 2007a. Bedrock Topography of Elgin Quadrangle, Kane and Cook Counties, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Elgin-BT, 1:24,000.

Curry, B.B., 2007b. Data Point Locations of Elgin Quadrangle, Kane and Cook Counties, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Elgin-DP, 1:24,000.

Curry, B.B., 2007c. Drift Thickness of Elgin Quadrangle, Kane and Cook Counties, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Elgin-DT, 1:24,000.

Curry, B.B., 2007d. Surficial Geology of Elgin Quadrangle, Kane and Cook Counties, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Elgin-SG, 1:24,000.

Curry, B.B. and D.A. Grimley, 2006. Provenance, Age, and Environment of Mid-Wisconsinan Slackwater Lake Sediment in the St. Louis Metro East Area, USA. *Quaternary Research* 65 (1), p. 108-122.

Denny, F.B., R.J. Jacobson, and W.J. Nelson, 2007. Bedrock Geology of Harrisburg Quadrangle, Saline County, Illinois. Illinois State Geological Survey, Illinois Preliminary Geologic Map, IPGM Harrisburg-BG, 1:24,000.

Devera, J., 2006. Bedrock Geology of Chester Quadrangle, Randolph County, Illinois. Illinois State Geological Survey, State Map Chester-BG, 1:24,000.

Dey, W.S., C.C. Abert, A.M. Davis, and B.B. Curry, 2007. Geologic Cross Sections, Kane County, Illinois. Illinois State Geological Survey, Illinois County Geologic Map, ICGM Kane-CS, 1:100,000.

Dey, W.S., B.B. Curry, A.M. Davis, and C.C. Abert, in progress. Kane County Water Resources Investigations: Final Report on Geologic Investigations. Illinois State Geological Survey.

Dey, W.S., A.M. Davis, C.C. Abert, B.B. Curry, and J.C. Sieving, 2006. Data Integration for Three-Dimensional Geologic Mapping of Ground Water Resources in Kane County, Illinois [abs]. National Ground Water Association, Abstract Book of the 2006 Ground Water Summit, April 22-27, 2006, San Antonio, TX, NGWA Press, Westerville, Ohio, p. 4.

Dey, W.S., A.M. Davis, and B.B. Curry, 2007a. Aquifer Sensitivity Map to Contamination, Kane County, Illinois. Illinois State Geological Survey, Illinois County Geologic Map, ICGM Kane-AS, 1:100,000.

Dey, W.S., A.M. Davis, and B.B. Curry, 2007b. Bedrock Geology, Kane County, Illinois. Illinois State Geological Survey, Illinois County Geologic Map, ICGM Kane-BG, 1:100,000.

- Dey, W.S., A.M. Davis, and B.B. Curry, 2007c. Major Quaternary Aquifers, Kane County, Illinois. Illinois State Geological Survey, Illinois County Geologic Map, ICGM Kane-QA, 1:100,000.
- Grimley, D.A., 2006. Surficial Geology of Mascoutah Quadrangle, St. Clair County, Illinois. Illinois State Geological Survey, Illinois Preliminary Geologic Map, IPGM Mascoutah-SG, 1:24,000.
- Grimley, D.A. and A.C. Phillips, 2006. Surficial Geology of Grantfork Quadrangle, Madison County, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map IGQ Grantfork-SG, 1:24,000.
- Grimley, D.A. and A.C. Phillips, 2006. Surficial Geology of Madison County, Illinois. Illinois State Geological Survey, Illinois Preliminary Geologic Map, IPGM Madison County-SG, 1:100,000.
- Gustison, S.R., P.M. Johaneck, and R.J. Finley, 2006. Energy Facilities Screening in Illinois; Guide to the Coal Availability and Resource Development in Illinois. ISGS Open-File Series 2006-1, p. 32.
- Jacobson, R.J. and F.B. Denny, 2007. Bedrock Geology of Vergennes Quadrangle, Perry and Jackson Counties, Illinois. Illinois State Geological Survey, Illinois Preliminary Geologic Map, IPGM Vergennes-BG, 1:24,000.
- Killey, M.M., 2007. Illinois' Ice Age Legacy. Illinois State Geological Survey, Geoscience Education Series 14, p. 74.
- Koike, S., I.G. Krapac, H.D. Oliver, A.C. Yannarell, J.C. Sanford, R.I. Aminov, and R. Mackie, 2007. Monitoring and Source Tracking of Tetracycline Resistance Genes in Lagoons and Groundwater Adjacent to Swine Production Facilities over a Three-Year Period. *Applied and Environmental Microbiology*, 73 (15), p. 4813-4823.
- Mehnert, E., W.S. Dey, H.H. Hwang, D.A. Keefer, T.R. Holm, T.M. Johnson, W.C. Beaumont, M.C.F. Wander, R.A. Sanford, J.M. McDonald, and S.M. Shiffer, 2006. Mass Balance of Nitrogen and Phosphorus in an Agriculture Watershed; the Shallow Groundwater Component. Illinois State Geological Survey, Open File Series 2005-03 revised, p. 121.
- Mehnert, E., H.H. Hwang, T.M. Johnson, R.A. Sanford, W.C. Beaumont, and T.R. Holm, 2007. Denitrification in the Shallow Ground Water of a Tile-Drained, Agricultural Watershed. *Journal of Environmental Quality* 36 (1), p. 80-90.
- Nelson, W. J., 2006. Bedrock Geology of Carrier Mills Quadrangle, Williamson and Saline Counties, Illinois. Illinois State Geological Survey, State Map Carrier Mills-BG, 1:24,000.
- Nelson, W.J., 2006. Bedrock Geology of Welge Quadrangle, Randolph and Jackson Counties, Illinois. Illinois State Geological Survey, State Map Welge-BG, 1:24,000.
- Panno, S.V., 2006. Characterization and Identification of Na-Cl Sources in Ground Water. *Ground Water* 44 (2), p. 176-187.
- Panno, S.V., 2006. Karst Aquifers; Can They Be Protected? *Ground Water* 44 (4), p. 494.
- Panno, S.V., W.R. Kelly, A.T. Martinsek, and K.C. Hackley, 2006. Estimating Background and Threshold Nitrate Concentrations Using Probability Graphs. *Ground Water* 44 (5), p. 697-709.

- Panno, S.V., W.R. Kelly, K.C. Hackley, and C.P. Weibel, 2007a. Chemical and Bacterial Quality of Aeration-Type Waste Water Treatment System Discharge. *Ground Water Monitoring and Remediation* 27 (2), p. 71-76.
- Panno, S.V., W.R. Kelly, A.T. Martinsek, and K.C. Hackley, 2007b. Database for Estimating Background and Threshold Nitrate Concentrations Using Probability Graphs. Illinois State Geological Survey Open-File Series 2007-4, p. 19.
- Phillips, A.C. and M.A. Aper, 2006. Surficial Geology of Lebanon Quadrangle, St. Clair County, Illinois. Illinois State Geological Survey, State Map Lebanon-SG, 1:24,000.
- Rine, J.M., J.M. Shafer, E. Covington, and R.C. Berg, 2006. Testing of Stack-Unit/Aquifer Sensitivity Analysis Using Contaminant Plume Distribution in the Subsurface of Savannah River Site, South Carolina, USA. *Hydrogeology Journal*, 14 (8), p. 1620-1634.
- Sahoo, G.B., C. Ray, E. Mehnert, and D.A. Keefer, 2006. Application of Artificial Neural Networks to Assess Pesticide Contamination in Shallow Groundwater. *Science of the Total Environment* 367 (1), p. 234-251.
- Stumpf, A.J., 2006. Surficial Geology of Lake Zurich Quadrangle, Cook and Lake Counties, Illinois. Illinois State Geological Survey, State Map Lake Zurich-SG, 1:24,000.
- Weibel, C.P. and F. Hardy, 2007. Drift Thickness of Oak Hill Quadrangle, Peoria County, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Oak Hill-DT, 1:24,000.
- Wang, H., 2007. Decadal-Scale Climate Variations in Carbonate Rhizolith: Most Reliable Soil Carbonates for High Resolution Stable Isotope Analysis. North Central-South Central GSA Conference, Lawrence, Kansas, April 11-13, 2007, p. 5.
- Wang, H. and S.E. Greenberg, 2007. Reconstructing the Response of C3 and C4 Plants to Decadal-Scale Climate Change during the Late Pleistocene in Southern Illinois Using Isotopic Analyses of Calcified Rootlets. *Quaternary Research* 67, p. 136-142.
- Weibel, C.P. and F. Hardy, 2007. Bedrock Topography of Oak Hill Quadrangle, Peoria County, Illinois. Illinois State Geological Survey, Illinois Geologic Quadrangle Map, IGQ Oak Hill-BT, 1:24,000.
- Weibel, C.P. and S.V. Panno, 2006. Delineation of Karst Regions in Drift Mantled Illinois [abs]. Geological Society of America, 2006 Annual Meeting and Exposition, Abstracts with Programs, v. 38, no. 4, p. 22.

ISWS Groundwater and Related Publications for 2006 and 2007

- Burch, S.L. and H.A. Wehrmann, 2007. A Summary of Pumpage from the Cambrian-Ordovician Aquifers of Northeastern Illinois, 2000-2004. ISWS Data/Case Study 2007-03.
- Holm, T.R., S.D. Wilson, and W.R. Kelly, 2006. Temporal Variability of Arsenic in Municipal Well Water. ISWS Contract Report 2006-07.
- Holm, T.R. and S.D. Wilson, 2006. Chemical Oxidation for Arsenic Removal. ISWS Contract Report 2006-10.
- Locke, R.A., II and S.C. Meyer, 2007. Kane County Water Resources Investigations: Final Report on Shallow Aquifer Potentiometric Surface Mapping. ISWS Contract Report 2007-06.

- Peyton, G.R., T.R. Holm, and J. Shim, 2006a. Development of Low-Cost Treatment Options for Arsenic Removal in Water Treatment Facilities. Midwest Technology Assistance Center for Small Public Water Systems, Publication TR06-03, p. 61.
- Peyton, G.R., T.R. Holm, and J. Shim, 2006b. Demonstration of Low-cost Arsenic Removal from a Variety of Illinois Drinking Waters. ISWS Contract Report 2006-08.
- Roadcap, G.S., R.A. Sanford, Q. Jin, J.R. Pardinas, and C.M. Bethke, 2006. Extremely Alkaline (pH>12) Ground Water Hosts Diverse Microbial Community. *Ground Water* 44(4):511–517.
- Sanford, R., T. Flynn, and W. Kelly, 2006. Microcosm Study of Arsenic Fate in Mahomet Aquifer Sediment and Groundwater. ISWS Contract Report 2006-11.
- Singh, A, B.S. Minsker, A.J. Valocchi, and D.D. Walker, 2007. Interactive Multi-objective Inverse Groundwater Modeling for the WIPP Site. Proceedings, World Environmental and Water Resources Congress 2007, Environmental and Water Resources Institute, American Society of Civil Engineers, Tampa, FL, CD-ROM.
- Walker, D.D., P.A. Cello, A.J. Valocchi, and B. Loftis, 2006. High-Throughput Computing for the Analysis of Tracer Tests in Fractured Aquifers. ISWS Contract Report 2006-4.
- Walker, D.D., P.A. Cello, A.J. Valocchi, and B. Loftis, 2006. Flow dimensions corresponding to stochastic models of heterogeneous aquifers. *Geophys, Research Letters*. vol. 33, L07407, doi: 10.1029/2006GL025695.
- Walker, D.D. and R.M. Roberts, 2007. Reply to Comment by Chia-Shyun Chen and I. Y. Liu on “Flow Dimensions Corresponding to Hydrogeologic Conditions.” *Water Resources Research* 43(2):W02602, doi:10.1029/2006WR005781.
- Wehrmann H.A., K.J. Hlinka, K.J. Brown, and T.P. Bryant, 2006. Illinois Community Water Supply Wells. ISWS Map Series 2006-01.
- Wehrmann, H.A. and H.V. Knapp, 2006. Prioritizing Illinois Aquifers and Watersheds for Water Supply Planning. ISWS Informational/Educational Materials 2006-04
- Winstanley, D., J.R. Angel, T.P. Bryant, H.V. Knapp, M.A. Palecki, A.M. Russell, and H.A. Wehrmann, 2006a. Drought Planning for Small Community Water Systems. ISWS Contract Report 2006-01.
- Winstanley, D., J.R. Angel, S.A. Changnon, H.V. Knapp, K.E. Kunkel, M.A. Palecki, R.W. Scott, and H.A. Wehrmann, 2006b. The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-supply Planning. ISWS Informational/Educational Materials 2006-02.

Appendix III. New United States Geological Survey Reports

Ayotte, J.D., S.M. Flanagan, and W.S. Morrow, 2007. Occurrence of uranium and 222radon in glacial and bedrock aquifer systems in the northern United States, 1993-2003. U.S. Geological Survey Scientific Investigations Report 2007-5037, p. 85.

Kay, R.T., 2006. Geology, Hydrology, and Water Quality of the Glacial Drift Aquifer in the Vicinity of the Nelson Landfill near Yorkville, Illinois. U.S. Geological Survey Open-File Report 2006-1045.

Kay, R.T., L.D. Arihood, T.L. Arnold, and K.K. Fowler, 2006. Hydrogeology, Water Use, and Simulated Ground-Water Flow and Availability in Campton Township, Kane County, Illinois. U.S. Geological Survey Scientific Investigations Report 2006-5076.

Thomas, M.A., 2007. The association of arsenic with redox conditions, depth, and ground-water age in the glacial aquifer system. U.S. Geological Survey Scientific Investigations Report 2007-5036, p. 26.

Appendix IV. Reports Developed by the Illinois EPA

- Cobb, R.P., December 7, 2006. Community Right-to-Know Implementation in the Bureau of Water, Community Right-to-Know 2006 Compliance Primer. Illinois Environmental Regulatory Group, p. 10.
- Cobb, R.P. and J.L. Manker, February 2006. How to Use the Source Water Assessment and Protection Internet Geographic Information System, CD-Rom. Illinois Environmental Protection Agency.
- Cobb, R.P., October, 19, 2006. Illinois' Mississippi River Source Water Protection Initiative. Ground Water Protection Council/Association of State Drinking Water Administrators, Source Water Protection Workshop Proceedings, Tempe, Arizona.
- Cobb, R.P., W.A. Dulka, and W.D. McMillan, September 2006. Illinois' Mississippi River Source Water Protection Initiative and Homeland Security. Association of State Drinking Water Administrator's Newsletter, p. 3.
- Cobb, R.P. and J. Konczyk, April 2007. Increasing Volatile Organic Compound Detections in Illinois Groundwater. National Groundwater Association's Groundwater Monitoring and Remediation Journal [Submitted for Publication], p. 8.
- Cobb, R.P., August 17, 2006. Non-degradation Issues Associated with Risk-based Remediation. United States Environmental Protection Agency Region 5, Annual State Groundwater/Source Water Protection Managers Meeting Proceedings, Peoria, Illinois.
- Cobb, R.P., December 24, 2007. Pre-filed testimony on Amendments to the Groundwater Quality Standards (35 Ill. Adm. Code 620). Illinois EPA, [In process], p. 33.
- Cobb, R.P., August 24, 2007. Pre-filed testimony on Procedures Required by P.A. 92-849 for Reporting Releases of Radionuclides at Nuclear Power Plants (New 35 Ill. Adm. Code Part 1010). Illinois Pollution Control Board Docket R07-02, <http://www.ipcb.state.il.us/cool/external/CaseView2.asp>, p. 44.
- Cobb, R.P., September 15, 2007. Prevention versus remediation. Groundwater Protection Council, Annual Conference Abstracts and Proceedings, San Diego, California, p. 6.
- Cobb, R.P., December 7, 2006. Source Water Assessment and Protection Web site, Community Right-to-Know 2006 Compliance Primer. Illinois Environmental Regulatory Group, p. 15.