



Illinois
Environmental
Protection Agency

Public Water Supplies
2200 Churchill Road
Springfield, Illinois 62794-9276

February 1992

Illinois Groundwater Protection Program:

A Biennial Report

*Prepared by the
Interagency Coordinating Committee
on Groundwater*

February, 1992





217/782-3397

February, 1992

*The Honorable Jim Edgar
Governor, State of Illinois*

*The Honorable Members of the
Illinois General Assembly*

I am pleased to transmit our report, "Illinois Groundwater Protection Program," which has been prepared pursuant to Section 4(b)(8) of the Illinois Groundwater Protection Act (P.A. 85-0863). This is the second biennial report of the Interagency Coordinating Committee on Groundwater.

The Act created a comprehensive, prevention-based policy focused upon beneficial uses of groundwater and preventing degradation. As shown in the report, much progress has been made but more is needed.

The report gives the status of the various elements of groundwater protection organized in the general order of the Act. An executive summary is provided for quick reference. The report also includes several figures, tables and appendices to help document our progress.

The Committee will be glad to respond to any suggestions or comments regarding the report.

Sincerely,

A handwritten signature in black ink, appearing to read "M.A. Gade".

Mary A. Gade
Director

Submitted to the Governor,
and the Illinois General Assembly

Illinois Groundwater Protection Program

BIENNIAL REPORT
February, 1992

Prepared by the
Interagency Coordinating Committee on Groundwater

EXECUTIVE SUMMARY

The Illinois Groundwater Protection Act (P.A. 85-0863, 1987) responds to the pervasive need to manage groundwater quality by a prevention-oriented process. The Illinois Groundwater Protection Act (IGPA) is a comprehensive law which relies upon a State and local partnership. Although the IGPA is directed toward protection of groundwater as a natural and public resource, special provisions target drinking water wells. This biennial report to the Governor and General Assembly is intended to provide a comprehensive overview of the implementation efforts since the adoption of the Act.

The Act responds to the need to protect groundwater quality and establishes a unified groundwater protection program using the following provisions:

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

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

Interagency Coordination

The IGPA created the Interagency Coordinating Committee on Groundwater (ICCG) to direct efforts of State agencies and to facilitate implementation. Ten State agencies actively participate in the ICCG and work together on a regular basis. The Director of the Illinois Environmental Protection Agency (IEPA) serves as the chair of the ICCG. The Governor-appointed Groundwater Advisory Council (GAC) has also been very active in directing the overall efforts.

The ICCG has established a Pesticide Subcommittee. This Subcommittee is chaired by the Illinois Department of Agriculture (DOA). The ICCG has also established a Groundwater Education Subcommittee. This Subcommittee is chaired by the Illinois Department of Energy and Natural Resources (ENR).

Education and Evaluation

An extensive groundwater education program is directed at those affected by the IGPA. Major initiatives include local and regional presentations and workshops, public participation projects, training programs and many other aspects developed in an annually revised workplan. The effort is coordinated by ENR.

ENR also has responsibility for developing a comprehensive groundwater evaluation program. A long-term plan has been developed by ENR's Water and Geological Survey Divisions and has been approved by the ICCG. The plan includes data collection and automation, groundwater quality monitoring, and quality and quantity assessments. Groundwater resource assessments are underway in a number of areas and within the priority groundwater protection planning regions. In addition, ENR is continuing to assess the impact that agricultural chemicals have had on groundwater in Illinois.

Two short-term projects mandated by IGPA have been completed by ENR--the recharge area delineation and prioritization, and an initial report on the impacts of pesticides on groundwater. In addition, the pilot project for assessing agricultural chemicals in rural private water supply wells is nearing completion by ENR.

The IEPA has conducted a synoptic analysis of public water supply wells. The data indicates that the overall quality of the State's groundwater is generally good. In certain areas, naturally-occurring levels of inorganic chemicals are causing limited use impairments. While quality statewide is not an issue, local conditions indicate that 4.6 percent of the public water wells tested had detectable levels of organic chemical contamination. Although the majority of affected water supplies do not exceed standards, their vulnerability to contamination supports a preventive approach. The IEPA has developed an ambient groundwater monitoring network for public water supply wells. The design of this network will be reviewed by the ICCG before implementation in 1992.

Wellhead Protection

The IGPA established a prevention based groundwater protection policy. A key part of this policy involves the wellhead protection program for both public and private water wells. The Act established minimum setback zones between water wells and potential sources or routes of contamination. It also provided that communities can expand the area to a maximum setback zone. Ten communities have already established maximum setback zones and the Agency is currently reviewing applications for twenty-one other communities, and is proposing maximum zones for three communities. The IEPA is conducting well site surveys and preparing reports for community water supplies. More than eighty percent of the wells in the State have been field surveyed. Over half

of the final reports have been sent to local officials. The IEPA and ENR are developing procedures for conducting groundwater protection needs assessments for communities. There are currently four pilot groundwater protection needs assessments being conducted in the two priority groundwater protection planning regions.

The IGPA also established provisions which allow the IEPA to issue an advisory of significant groundwater hazard. These advisories can be issued where the IEPA determines that a potential route, potential secondary source or a potential primary source, identified in the well site survey process, represents a significant hazard to either public health or the environment. The IEPA has issued five groundwater advisories to date. The IEPA is continuing to evaluate completed well site surveys to determine if advisories should be issued.

The IEPA issued three of the groundwater advisories, as described above, to the community water supplies serving Marquette Heights, North Pekin and Creve Coeur. These community water supplies had wells located in close proximity to a spill which occurred at an Amoco Oil Company terminal. As a follow-up to these advisories, the IEPA sent an enforcement notice letter to Amoco Oil Company on July 23, 1990. As a result, an Interim Agreed Order between the IEPA, the Attorney General, and Amoco Oil Company was entered in Tazewell County Circuit Court. Accordingly, Amoco Oil Company agreed to remediate the site using a groundwater pump and treatment system. The IEPA will continue to aggressively oversee the remediation at the Amoco Terminal to ensure the protection of the nearby community water supply wells.

The IGPA also requires the IEPA to perform a hazard review where a municipality under a population of 5,000 or county under population of 25,000 requests the IEPA to perform a review after receipt of a well site survey

report. The IEPA has received three requests and has prepared three comprehensive hazard review reports.

The IEPA, in cooperation with the State Water Survey Division of ENR, submitted a Wellhead Protection Program (WHPP) to the United States Environmental Protection Agency (USEPA) pursuant to Section 1428 of the Safe Drinking Water Act (SDWA). The SDWA, as amended in 1986, required states to prepare and submit a WHPP to the USEPA. On September 27, 1991 USEPA fully approved the Illinois WHPP. This action makes Illinois the first state among six in USEPA's Region V to receive this approval.

Regional Protection

The protection of regional groundwater quality is also provided by the regional groundwater protection planning process. To assist in this process, ENR has developed a prioritized recharge area map. In the first Biennial Report of 1990 two pilot priority groundwater protection planning regions were proposed. These two regions have been established and the associated planning committees have been designated by the IEPA Director. The IEPA is proposing the designation of one or two additional regions in 1992.

Groundwater Standards and Regulations

The IGPA required that new groundwater quality standards be developed to protect groundwaters. The IEPA's proposal was filed with the Pollution Control Board (Board) in September of 1989 after extensive public outreach efforts, interest group review, and considerable technical review. The Groundwater Quality Standards: provide for classification, set numeric standards, establish preventive management and nondegradation procedures. The Board adopted the groundwater standards as a final rule on November 7, 1991 and they became effective on November 25, 1991.

The IGPA established the authority to develop technology regulations, a minimum hazard certification program, and monitoring well code revisions. These are in various stages of development and implementation. The technology regulations for existing and new activities within setback zones and regulated recharge areas were adopted by the Board on December 6, 1991. The Department of Public Health (DPH) has developed a final monitoring well code, closed loop heat pump and back flow prevention rules for the protection of groundwater, which will become effective in 1992. It is anticipated that the minimal hazard certification program will become much more active because of the adoption of the technology control regulations.

Agricultural Control

Illinois must develop a State Pesticide Management Plan (SPMP) for groundwater protection. The ICCG has taken the lead in addressing this matter.

The DOA developed rules for agrichemical facility containment which were promulgated on January 1, 1990. These rules established a registration and permitting process which DOA has used to establish a compliance schedule with these rules. To date DOA has received approximately 275 permit applications, and 40 permits have been issued.

The Department has also initiated a pilot groundwater sampling program for pesticides in rural private water supply wells.

Groundwater Quality Protection Future Directions

The priorities of the groundwater protection program for the next two years are as follows:

- Implement the groundwater quality standards and technology regulations;
- Continue to operate and expand the regional groundwater protection planning process;

- Continue to encourage community water supplies to establish maximum setback zones;
- Develop and implement a groundwater protection needs assessment process;
- Implement a long-term groundwater monitoring network; and
- Develop a State Pesticide Management Plan.

The first two years of groundwater protection program efforts involved the development of standards and regulations. The next two years will also continue to involve the development of certain elements, but will also involve implementation of newly promulgated standards and regulations.

Table of Contents

Introduction.	1
Interagency Coordinating Committee on Groundwater	2
Groundwater Advisory Council.	5
Groundwater Education Program	8
Groundwater Evaluation Program.	13
ENR Resource Assessments	
ENR Water Quality Assessments	
ENR Data Collection and Automation	
ENR Evaluation of Agrichemical Impacts on Groundwater	
ENR Other Basic and Applied Groundwater Research	
IEPA Groundwater Quality Assessment	
Design of an Ambient Network of Community Water Supply Wells	
Groundwater Quantity, Use and Expansion	
Groundwater Regulations	32
Groundwater Quality Standards	
Technology Control Regulations	
Agricultural Chemicals and Groundwater Protection Program	41
Agrichemical Facility Containment Program	
Statewide Survey of Agrichemical in Rural Private Water Supply Wells	
Development of an Illinois Pesticide Strategy Plan	
Illinois Wellhead Protection Program.	55
Minimum Setback Zone	
Maximum Setback Zone	
Quarterly Wellhead Protection Status Report	
Well Site Surveys	
Hazard Review	
Groundwater Protection Needs Assessment	
Regional Groundwater Protection Program	69
Regional Groundwater Planning Program	
Regulated Recharge Areas	
Groundwater Enforcement	73
Advisories of Groundwater Contamination Hazards	75
Department of Public Health Groundwater Protection Program.	77
Minimal Hazard Certification Program.	78
The Future of Groundwater Quality Protection.	79

List of Figures

Figure 1 -	Public Water Supply Wells Tested for Inorganic and Volatile Organic and Aromatic Constituents	23
Figure 2 -	Public Water Supply Wells with Volatile Organic and Aromatic Constituent Detections	23
Figure 3 -	Public Water Supply Wells with Synthetic Organic Compound Detections	26
Figure 4 -	Community Well Subnetworks	29
Figure 5 -	Trend Site Subnetwork.	29
Figure 6 -	Pesticide Subnetwork	30
Figure 7 -	One-Time Subnetwork.	30
Figure 8 -	Progress Made After Initiating the Quarterly Wellhead Protection Status Report Process, Number of Communities.	61
Figure 9 -	Progress Made After Initiating the Quarterly Wellhead Protection Status Report Process, Number of Wells	61
Figure 10 -	Community Wells per County	62
Figure 11 -	Number of Well Site Surveys Completed per County	64
Figure 12 -	Number of Well Site Survey Reports Completed per County.	65
Figure 13 -	Regional Groundwater Protection Planning Committees.	70

List of Tables

Table I. Interagency Coordinating Committee on Groundwater Members. 2
Table II. Groundwater Advisory Council Members 5
Table III. Synthetic Organic Compound Analyses Summary. 27

List of Appendices

Appendix. A - Summary of Inorganic Analyses. 85

Appendix. B - General Statistical Summary of Volatile Organic and Aromatic
Constituents 87

Appendix. C - General Statistical Summary of Synthetic Organic Compounds . 89

Appendix. D - Summary of Synthetic Organic Compounds Detected in Public
Water Supply Wells 91

Appendix. E - IEPA Remedial Action Summary in Response to Contaminated
Community Water Supply Wells and Listing of Major Problems
with Community Water Supply Wells. 93

INTRODUCTION

The Illinois Groundwater Protection Act (IGPA) was approved by the General Assembly and signed by the Governor on September 24, 1987. The IGPA establishes a comprehensive program for the protection of groundwaters. Some parts of the program, such as minimum setback zones for wellhead protection, became effective January 1, 1988. Other parts of the program, however, required more developmental work or rulemaking in order to be implemented. The comprehensive groundwater quality standards and the recharge area planning program are examples of these provisions. The Interagency Coordinating Committee on Groundwater (ICCG) was established by the IGPA as a means to foster greater coordination among state agencies. Section 4(b)(8) requires the ICCG to report biennially to the Governor and the General Assembly on groundwater quality, groundwater quantity, and the State's enforcement efforts. The legislation establishes a general policy on groundwater, as follows:

"It is the policy of the State of Illinois to restore, protect and enhance the groundwaters of the State, as a natural and public resource. The State recognizes the essential and pervasive role of groundwater in the social and economic well-being of the people of Illinois and its vital importance to general health, safety and welfare. It is further recognized as consistent with this policy that groundwater resources of the State be utilized for beneficial and legitimate purposes, waste and degradation of the resource be prevented, and underground water be managed to allow maximum benefit for people of the State of Illinois."

This second report, is intended to set a meaningful comprehensive status report on the groundwater of the State. This can serve as a base upon which to compare the progress and status of program responses to the groundwater issues. The overall report is presented in the general order of the IGPA. The report presents a status on these elements. In addition, the report also includes information on the status and direction of groundwater quantity initiatives in Illinois.

INTERAGENCY COORDINATING COMMITTEE ON GROUNDWATER (ICCG)

The IGPA requires the creation of the ICCG. This Committee is chaired by the Director of the IEPA or designee and has members from ten State agencies which have some jurisdiction over groundwater. The IEPA, Illinois Department of Public Health (DPH), Department of Energy and Natural Resources (ENR), Department of Mines and Minerals (DMM), Office of the State Fire Marshall (OSFM), Illinois Department of Transportation - Division of Water Resources (IDOT/DWR), Department of Agriculture (DOA), Emergency Services and Disaster Agency (ESDA), Department of Nuclear Safety (DNS), and the Department of Commerce and Community Affairs (DCCA). The Committee is required to meet at least twice a year to review and coordinate the State's groundwater protection policy as well as evaluate regulations that relate to groundwater and assess the effectiveness of the State's efforts to protect and improve groundwater. The Committee must also review and make recommendations on groundwater research and data collection and dissemination programs. Table I lists the Agency director or designee on the Committee:

Table I. Interagency Coordinating Committee on Groundwater (ICCG)

ENVIRONMENTAL PROTECTION AGENCY
Mary Gade, (Chair)
Roger Kanerva, Designate

DEPT. OF ENERGY & NATURAL RESOURCES
David Baker

DEPT. OF PUBLIC HEALTH
David Antonacci

STATE FIRE MARSHAL
Jim McCaslin

DEPT. OF TRANSPORTATION
Don Vonnahme
Gary Clark, Designate

DEPT. OF MINES AND MINERALS
Gwenyth Thompson

DEPT. OF AGRICULTURE
Warren Goetsch

EMERGENCY SERVICES & DISASTER AGENCY
Ron Stephens

DEPT. OF COMMERCE & COMMUNITY AFFAIRS
Stewart Schrodt

DEPT. OF NUCLEAR SAFETY
Dave Ed

GOVERNOR'S OFFICE
Allen Grosboll

Section 4(b) of the IGPA provides that the Committee shall:

- "(1) review and coordinate the State's policy on groundwater protection;
- (2) review and evaluate State laws, regulations, and procedures that relate to groundwater protection;
- (3) review and evaluate the status of the State's efforts to improve the quality of the groundwater and of the State enforcement efforts for protection of the groundwater and make recommendations on improving the State efforts to protect the groundwater;
- (4) recommend procedures for better coordination among State groundwater programs and with local programs related to groundwater protection;
- (5) review and recommend 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;
- (6) make recommendations for and prioritize the State's groundwater research needs;
- (7) review, coordinate, and evaluate groundwater data collection and analysis; and
- (8) beginning on January 1, 1990, report biennially to the Governor and the General Assembly on groundwater quality, quantity, and the State's enforcement efforts."

The ICCG first met on September 21, 1987. Since that time, the Committee has met every several months to accomplish its legislative mandate. The Committee met twice in 1987, five times in 1988, six times in 1989, four times in 1990, and four times in 1991.

An Implementation Plan was developed by the ICCG and later approved by the GAC. A regulatory agenda was also developed pursuant to the IGPA. The Committee has had success in coordinating and assisting in many aspects of the

groundwater protection program. In addition, the committee has established several subcommittees to facilitate program implementation, as follows:

- Groundwater Education Subcommittee chaired by ENR
- Pesticide Subcommittee chaired by DOA
- Monitoring Well Code Subcommittee chaired by DPH

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

GROUNDWATER ADVISORY COUNCIL (GAC)

The IGPA also calls for the formation of the Groundwater Advisory Council (GAC). The Council is designed to allow the public, industry, and local governments to meet with the State government. Specifically, the Council is composed of nine public members appointed by the Governor, two people representing environmental interests, two people representing industrial and commercial interests and one person each representing interest groups in agriculture, local government, regional planning, public water supply, and water well drilling. The members, who serve three-year terms, elect a chairman from among their members, by majority vote.

Section 5(a) of the IGPA provides that the Council shall:

- "(1) review, evaluate, and make recommendations regarding State laws, regulations and procedures that relate to groundwater protection;
- (2) review, evaluate, and make recommendations regarding the State's efforts to implement this Act and to generally protect the groundwater of the State;
- (3) make recommendations relating to the State's needs for groundwater research; and
- (4) review, evaluate, and make recommendations regarding groundwater data collection and analyses."

The diversity of the Council members' backgrounds provides unique points of view when the Council reviews and evaluates groundwater protection policy, program implementation and research/data collection, which are its mandates. The GAC met three times during 1990 and three times during 1991. The first Council prepared a three-year status report on the activities which

they were involved with and provided their recommendations for future activities in groundwater protection. The Council has participated in the review and evaluation of various efforts and provided recommendations regarding many aspects of the groundwater program. Joint meetings of the ICCG and GAC have helped to provide for close cooperation. The following describes the activities which the GAC was involved with to date.

1. The GAC has contributed greatly to implementation of the IGPA. It has reviewed and commented to IEPA on issues involved in the development of the Groundwater Quality Standards. The GAC sponsored the "Groundwater Protection Policy Forum" on December 1, 1988 to provide a process to develop policy issues and responses relating to groundwater protection and the groundwater quality standards setting process. It has also reviewed and provided comments on proposed Department of Public Health regulations for Chemigation Facilities and Closed Loop Heat Pumps.

2. The Council helped to establish a discussion group which focused on the issue of Lake Michigan water supply.

In addition, the Council made the following observations and recommendations for future groundwater protection efforts:

1. The Council believes that ENR has done an excellent job on their groundwater education program, but the public still does not have an understanding of groundwater issues.

2. The two regional groundwater planning areas were selected and they should be utilizing local colleges and universities for input to the planning regions.

3. The Council encourages public water supplies to establish a maximum setback zones to greater protect their source of drinking water.

4. The Council appreciates the opportunity to provide input to the groundwater quality standards.

5. The Council believes that the public needs to be more aware of the effects of pesticide use on groundwater.

EDUCATION PROGRAM FOR GROUNDWATER PROTECTION

Overview

The IGPA required the Department of Energy and Natural Resources, with the cooperation of the Environmental Protection Agency, the Department of Public Health, the Department of Agriculture and others as needed, to develop, coordinate and conduct an education program for groundwater protection. The program is to include, but not be limited to, education for the general public, business, agriculture, government, and private water supply owners, users and operators.

The education program is to address at least the following topics: hydrogeologic principles, groundwater protection issues, Illinois groundwater policy, potential contamination sources, potential water quality programs, well protection measures, and the need for periodic well tests. ENR is directed to cooperate with local governments and regional planning agencies and committees, to coordinate local and regional education programs and workshops, and to expedite the exchange of technical information.

This program is coordinated by the education subcommittee of the ICCG. A total of fifteen state and federal agencies, and over twenty-five state-wide organizations have directly participated. An interagency protocol, annual work plan, and annual evaluation direct the program to the educational needs of nine identified constituencies. The following list indicates the constituencies.

1. General audience (through fairs and mass media);
2. Groundwater practitioners, professionals and planners;
3. Municipal officials;
4. Business and industry;
5. Agricultural community;
6. Private well owners;

7. Illinois teachers;
8. Association representatives;
9. Legislators;

A partial list of the Groundwater Education Program achievements for September 1987 to December 1991 and the associated lead agencies follows:

Produced or published materials using the interagency protocol

- 'Safeguard' - general brochure and "Questions and Answers on IGPA" (Rev. 91) (ENR)
- 'Primer' - detailed explanation of IGPA as related to community water wells (IEPA)
- 'The Act' and index - over 3,000 copies of IGPA were distributed (LRB, ENR)
- Displays - colorful presentations of groundwater protection for meetings and fairs (ENR)
- Overhead slide set - 80 concept slides related to hydrology, groundwater threats, and IGPA (ENR)
- Slide set - "Protecting Illinois' Invaluable Hidden Resources" (ENR)
- "Suggested Activities for Groundwater Protection" (ENR)
- Circular: "Planning Your Well" (WRC-CES)
- Groundwater Standards: "Issues and Options" and "Discussion Paper" documents (ICCG, IEPA)
- Videos - "Community Groundwater Protection" (IEPA); "Invisible Resource" (ENR), "Sealing Abandoned Wells" (ENR)
- Brochures: "Community Water Supply Planning" and "Maximum Setback Zones" (IEPA)
- Posters: Three posters on sealing abandoned wells and wellhead protection (ENR)
- Library displays: twenty displays to circulate in the library systems (ENR, Sec. of State)
- "Maximum Setback Zone Workbook" (IEPA)
- Circular: "Safe Drinking Water: Testing and Treating Home Drinking Water" (CES)

- "Campaign Primer for Sealing Abandoned Wells" (Prairie Hills RC & D, ENR)

"Progress in Groundwater Protection": workshop proceedings (ENR, 11 other agencies)

- Video and audio press releases and public service announcements (ENR)
- Obtained and distributed twenty other brochures from various sources on groundwater protection measures
- Conducted seven media events on wellhead protection and on sealing abandoned wells
- Conducted ten statewide workshops with average attendance of just over 100
- Conducted seventeen workshops for public health officials and water well drillers (DPH)
- Conducted three discussion meetings on groundwater quality standards (IEPA, ENR)
- Conducted sixteen workshops for county agricultural staffs (DOA, CES, SCS, IFCA)
- Developed and distributed "Buried Treasure - Education Activity Guide" to over 4,200 K-12 teachers (EEAI, ENR)
- Conducted about ninety workshops for teachers (EEAI, ENR)
- Responded to thousands of requests for information through contacts and an /800' hotline
- Distributed multi-agency groundwater protection month packets to 650 news outlets, 210 association contacts, 201 legislators, and more than 3,000 local government units
- Maintained a groundwater speakers bureau with over 40 speakers statewide (ENR)
- Made presentations or had displays on groundwater protection at about 475 professional, trade and civic association meetings
- Notified legislators of groundwater educational materials and services
- Distributed twelve issues of the newsletter "Groundwater Gazette" on a quarterly basis to about 350 newsletter editors, teachers, agency officials, academics, and association executives (ENR)
- Developed and distributed seven (of twelve planned) groundwater protection articles for weekly newspapers (SGS, SWS, DPH, EPA, OSFM)

- Developed an electronic bulletin board: Groundwater Education Network (GWEN) for newsletter editors, teachers, and groundwater specialists

Current Groundwater Protection Education Initiatives

The 1991 annual evaluation identified and prioritized six areas needing special emphasis. These are incorporated in the FY 1992 annual work plan:

1. Educational and technical assistance to small, public water supply systems - This is being addressed through a Rural Affairs Council grant to the Illinois Rural Water Association, which has hired a circuit-rider to help small towns with groundwater protection. The circuit-rider helps determine the lateral areas of influence of wells so the communities can adopt maximum setback zones.
2. Regional groundwater education programs - The two regional groundwater protection planning committees have formed education subcommittees. ENR is providing each with a \$2,000 contract to support their educational activities, which target community officials, business groups and teachers.
3. Business and industry educational outreach - When the groundwater quality standards, the regulations for certain activities in setback zones and regulated recharge areas, and the administrative rules for the minimal hazard certification program are adopted, the education program will develop and distribute compliance guides for business and industry officials.
4. Revision and expansion of groundwater education materials for schools - The Environmental Education Association of Illinois recently developed a revised edition of its very popular: Buried Treasure: Education Activity Guide. Following field testing, it will be provided to teachers through workshops.
5. Planning, Zoning and Groundwater - A contract was recently signed with the University of Illinois--Department of Urban and Regional Planning to develop two guidance documents. They will demonstrate to both lay and professional planning and zoning officials methods of incorporating groundwater protection into local government operations. An educational campaign will follow their publication.
6. Well-sealing demonstrations - An estimated 50 to 150,000 abandoned wells dot the rural and urban landscape of Illinois. They present both safety and groundwater contamination liabilities, often not recognized by the wells' owners. A coalition of eight non-governmental organizations was formed in the fall of 1991 to encourage well-sealing demonstrations in each Illinois county. When a source of funds is found, the coalition will operate a bounty program for wells sealed as part of a demonstration. The organizations include:

- Association of Illinois Soil and Water Conservation Districts
- Illinois Environmental Health Association
- Illinois Farm Bureau
- Illinois Water Well Association
- Illinois Rural Water Association
- Illinois Society of Professional Farm Managers and Rural Appraisers
- Illinois Chapter of the Soil and Water Conservation Society
- Illinois Land Improvement Contractors Association."

Future Initiatives

The work carried out by each agency and organization is dependent on the availability of staff, resources and funds. Anticipated initiatives include:

- Review and revision of the Education Program Document
- Major expansion of the business and industry component
- Expanded groundwater workshop opportunities for teachers
- A campaign to help farmers become aware of their potential eligibility for the USDA Conservation Reserve Program if their land is within the state designated wellhead protection area of a public water supply well (there are about 9,600 in the state).

Summary

The groundwater protection education program is actively adapting to public needs as the overall IGPA work proceeds and matures. The process developed for interagency and association coordination appears to work very well. The nine identified constituencies are provided educational materials and services appropriate for their needs.

GROUNDWATER EVALUATION PROGRAM

Section 7 of the IGPA requires ENR, in consultation with the ICCG and the GAC, to develop a groundwater program consisting of resource assessments, data collection and automation, and groundwater monitoring. The information generated by this comprehensive program will be useful to both state and local government and will lead to better understanding, protection and management of Illinois groundwater. A long-term plan, developed by ENR's Water and Geological Surveys and approved by the ICCG, is being implemented as funds become available. In addition to the long-term evaluation program, the legislature mandated two short-term studies -- statewide recharge area mapping, and an initial report on the impacts of pesticides on groundwater.

Over the last four years, information generated by the groundwater evaluation program has enhanced the ability of state and local government to protect and manage groundwater resources. The Illinois State Geological Survey (SGS) and Illinois State Water Survey (SWS), Divisions of the Illinois Department of Energy and Natural Resources, have completed, or have underway, regional groundwater assessments in several areas of the state, and are conducting a pilot groundwater protection needs assessment in Woodstock, Illinois. The Geological and Water Surveys are also continuing to assess the impact that agricultural chemicals have had on groundwater in Illinois, and to automate groundwater related data.

In order to conduct the research described below, the Surveys and the Department have supplemented IGPA program appropriations with funding from other sources and programs.

The groundwater assessments mandated by the IGPA include both resource assessments (aquifer mapping) and evaluation of baseline groundwater quality. Regional assessments are underway in the following areas of the state.

ENR Resource Assessments

WOODSTOCK. During 1992, the Water and Geological Surveys will complete a pilot groundwater protection needs assessment for Woodstock, IL., which lies within the Northern Priority Groundwater Protection Planning Region. The project involves detailed geologic and hydrologic mapping to define areas of potential contamination and evaluate aquifer characteristics. Completed are the preliminary geologic cross sections, isopach maps (e.g., geologic formation thickness) of the four aquifers in the area, a geologic stack-unit map to a depth of 100 feet, and an aquifer contamination potential map. Potentiometric surface (i.e., groundwater elevation) maps of the different aquifers will be constructed and used for recharge area delineation. The needs assessment methodology tested and refined in this pilot study will assist IEPA, counties, municipalities, and consultants in determining data requirements for groundwater protection needs assessments in other areas. A workshop is planned in conjunction with the IEPA to discuss the methods and results of the pilot assessment.

MCHEMRY COUNTY. The Woodstock pilot assessment has assisted groundwater scientists in developing a methodological approach for groundwater protection mapping of McHenry County. A two-year project has begun which will increase knowledge of the hydrologic and geologic framework of the county at a level of detail useful for county decision-making. In addition, the project will provide the regional groundwater flow information critical for the other McHenry County communities that wish to conduct groundwater protection needs assessments.

NORTHWESTERN ILLINOIS. The SGS has completed maps of the Green River Lowlands area of northwestern Illinois. This is a heavily agricultural area with shallow aquifers in portions of Bureau, Henry, Lee, Rock Island, and Whiteside counties. Also in this area, the SWS is constructing regional

potentiometric surface maps in order to describe the dominant flow directions in the major sand and gravel aquifers in Lee, Whiteside, and Bureau counties.

MASON AND TAZEWELL COUNTIES. Another study recently begun will determine the groundwater levels in the Havana lowlands region of Mason and Tazewell counties. Measurements of water levels in existing wells and in new observation wells will be conducted in the fall of 1992, to indicate the impact of seasonal irrigation pumpage, and again in the spring of 1993, to indicate recharge and recovery of groundwater levels. These levels will be compared to measurements taken in 1960 to determine if, or what, significant changes have occurred because of increased irrigation over the last 30 years. The study is being conducted for the Imperial Valley Water Authority.

SOUTHERN TAZEWELL COUNTY. The SWS is investigating the sand and gravel aquifers in southern Tazewell and western McLean counties in order to develop a detailed understanding of the flow system of the Sankoty Sand aquifer. The study area will include major portions of the Central Priority Groundwater Protection Planning Region.

NORTHEASTERN ILLINOIS. In the northeastern part of the state, deep well water levels are being measured to determine trends in groundwater use and water levels for the deep bedrock aquifer system in a 15-county area. It is the ninth detailed measurement of water levels in this deep aquifer system conducted by the SWS since 1958. The results will be presented in a report along with maps and tables for use by regional planners and by municipal and industrial water operators. These results should be particularly interesting because many communities have converted from well water to Lake Michigan water.

STATEWIDE BEDROCK MAP. A bedrock topography map of the state was recently updated to better define valleys in the bedrock surface. Bedrock valleys commonly contain deposits that can be important sources of groundwater in scattered locations. Working with the United States Geological Survey (USGS)

the SGS is currently digitizing the map to make future updates easier.

NORTHERN ILLINOIS. In 1989, the SGS began a four-year investigation of the hydrogeology of the shallow carbonate bedrock aquifers in northern Illinois. These rocks are widely used as a groundwater resource, but are highly susceptible to contamination. The study will show variations in the water-producing areas of the aquifers and contamination potential.

KANE COUNTY. Four SGS studies have identified aquifers with large potential groundwater supplies in the glacial drift and shallow bedrock of Kane County. Study areas included the Aurora, Geneva-Batavia and St. Charles areas, and the Fox River Corridor. A similar study is underway for North Aurora and another is planned for the village of Gilberts.

ENR Water Quality Assessments

PEORIA-PEKIN. Because industrial activity in the area presented a contamination potential, the SWS investigated the groundwater quality of the sand and gravel aquifer in the Peoria-Pekin area. Preliminary assessment of water chemistry has shown no regional contamination, although localized contamination is known to exist in the study area.

SOUTHEAST CHICAGO. A large number of potential sources of contamination are located in southeast Chicago. The SWS is studying the area to determine the extent to which the shallow groundwater and surface waters of the region, specifically Lake Calumet, are being contaminated by these sources. The types of contaminants, their potential sources, and their rates of movement through the shallow, unconsolidated materials are being investigated. Although widespread groundwater contamination in the surficial materials has not been found at this stage of the investigation, several areas of serious trace metal and organic contamination will be researched further.

METRO-EAST. The SWS has completed a study of the regional groundwater quality of the shallow alluvial aquifer underlying the Metro-East area. The

118- square-mile study area was chosen for investigation because local industrial activity and the hydrogeologic nature of the shallow alluvial aquifer gave it a high propensity for groundwater contamination. The study found that some contamination is present as predicted by a conceptual model. However, not all wells in that region showed contamination, suggesting that the contamination is localized and that regional contamination has not occurred.

ENR Data Collection and Automation

The data collection and automation program mandated by the IGPA is proceeding. Water well record information (well location, depth, and date drilled) for more than ninety-five counties and geologic information for sixteen counties has been computerized by the SWS for the groundwater database. In addition, a statewide system has been set up to automate key stratigraphic locations and is being used to automate data collected during the Woodstock pilot needs assessment and the larger McHenry County project.

ENR Evaluation of Agrichemical Impacts on Groundwater

Several studies are underway which evaluate the impact of agricultural chemicals on groundwater. These include a pilot study in five counties, a statewide survey, an investigation of shallow wells, and guidelines for addressing contamination at agrichemical facilities.

PILOT STUDY. The Water and Geological surveys are nearing completion of a three-year pilot study of agricultural chemicals in rural, private water wells. The results will provide a preliminary assessment of the occurrence of agricultural chemicals in rural, private wells in five representative hydrogeologic settings located in Mason, Kankakee, Livingston, Piatt, and Effingham counties. Sampling and chemical analyses have been completed, as have detailed characterizations of the hydrogeologic conditions and land use

of the five areas. The final report, which will include results of the chemical analyses and characterizations, should be available later in 1992.

STATEWIDE SURVEY. In addition to the pilot study, a similar survey is being conducted statewide by the Illinois Department of Agriculture and the Cooperative Extension Service - University of Illinois at Urbana-Champaign with technical assistance from the ISGS. Groundwater samples are being collected from 340 randomly selected wells and analyzed for nitrate, nitrite, and several pesticides and metabolites. Results of the sampling, begun in March 1991 and continuing through March 1992, will provide statistically reliable estimates of agricultural chemical contamination in rural private wells.

SHALLOW WELLS. The SWS launched a multiple-year effort in 1990 to evaluate the magnitude and extent of agricultural chemical contamination of shallow-bored and dug wells in Christian and Edgar counties -- counties with large numbers of shallow large diameter wells. Twenty-five wells in each county were sampled in January and June 1991. Preliminary results show nitrate in forty-nine of the fifty wells, with samples from sixteen wells exceeding the USEPA maximum contaminant level (MCL). In addition, pesticides were detected in fourteen wells, with four samples exceeding an MCL for a particular chemical. A subset of the fifty wells were again sampled in August, October and December in order to evaluate the temporal distribution of identified chemicals in these wells.

PESTICIDE CONTAMINATION GUIDELINES. Another SGS study is developing procedures and guidelines for addressing pesticide contamination at agrichemical facilities in Illinois. The project will help DOA develop guidelines and recommendations regarding long-term financial resources necessary to remediate potential pesticide contamination.

ENR Other Basic and Applied Groundwater Research

As part of their overall research mandate, the Water and Geological surveys conduct other basic and applied research related to groundwater. The following are recent studies which support groundwater resource protection.

- A methodology is being developed by the SWS that will help to determine optimal pumping rates for a well field so that the risk of contamination is minimized and a specific total withdrawal from the well field is maintained. The methodology will be formulated so that it will be practical and easy to implement on a personal computer.

- A field study in Rockford will attempt to improve the overall reliability of subsurface site characterization methods for volatile organic compounds (VOCs). The SWS chose the field site in southeast Rockford because a variety of VOCs (principally trichloroethene, trichloroethane, dichloroethene, and dichloroethane) have been found in private and public water supply wells located in the area. Analytical results from these samplings, along with measurements of the physical and hydraulic properties of the aquifer, will be used to assess why contaminant concentrations change within the aquifer.

- The SWS recently completed a multi-year study of groundwater resources for the Jake Wolf Fish Hatchery well field in Mason County. The study included an evaluation of the condition of the wells, an assessment of natural recharge to the shallow aquifer, and recommendations for procuring an additional 2,500 gallons per minute water supply needed for facility expansion.

- A two-dimensional digital modeling study of the shallow dolomite aquifer in Kankakee and Iroquois counties is in the final year of a three-year effort. The study is designed to develop a model of the heavily-pumped regional aquifer to serve as a predictor of water levels in the

aquifer and as a tool for future management strategies, if necessary.

- At the SWS, studies have recently been completed on irrigation practices in Illinois, groundwater supply and demand, and groundwater quantity use laws and management. Another study summarizes developing conflicts over groundwater withdrawals from the buried Mahomet bedrock valley, and work is continuing on an interdisciplinary project to document the effects of climate change on shallow groundwater levels and on groundwater demand for irrigation.

- The SGS is working with the USGS, Reston, VA to develop a methodology for contamination potential mapping throughout the Midwest. This work is an out-growth of SGS contamination potential mapping for Illinois. The purpose of this project is to assist Region V - USEPA with a regional understanding of the factors and data necessary to evaluate aquifer contamination potential.

- The SGS recently completed an economic assessment of the value of geologic mapping as it applies to groundwater contamination potential. The study concluded that geologic information helps prevent future costs of contamination. Benefit-cost ratios were as high as 50:1, and even the most conservative estimates suggested that geologic mapping pays for itself. Costs of mapping and potential environmental benefits were derived from data collected from Boone and Winnebago counties. IEPA contamination investigation costs as well as other government and private industry investigations, remediations and clean-up costs were also used.

- The SWS has performed computer simulations of more than 300 groundwater systems in support of IEPA's Wellhead Protection Program proposal to USEPA. One-year and five-year capture zones were computed for each public water supply well studied. The five-year capture zones provided preliminary estimates of the protection afforded municipal groundwater supplies by wellhead protection areas.

- Geothermal prospecting for groundwater, a method that utilizes small variations in ground temperature to locate shallow aquifers, was conceived by SGS scientists in the 1960s. The technique was limited because it assumed a single type of soil. A new computer model of heat and water flow in soils has been combined with field data from SGS investigations to make this technique applicable to layered soils.

- The SGS constructed 150 geologic cross-sections illustrating the relationship between stratigraphy and estimated water quality for 19 counties surrounding the main oil-producing portion of the Illinois Basin. The cross sections and accompanying reports will help the Illinois Department of Mines and Minerals determine the depth of groundwater having total dissolved solids greater than 10,000 parts per million. This mapping is being done to distinguish groundwaters which are potential drinking water supplies, so that they would be protected from contamination by oil and gas wells. By law, these wells must be cased through potential drinking water supplies.

- A computer program which will estimate aquifer properties from a limited number of measured values is being developed by the SGS. When fully developed, the model will provide planners with a scientific basis for making decisions on groundwater resource management.

- The SGS has built and is monitoring a field scale clay liner, similar to those used on the bottom of state-of-the-art landfills. A foot of water has been ponded on the three-foot liner since 1988. No water has moved through it yet, making it the most successful experimental liner built to date and proving that liners can be built to meet USEPA criteria for rate of liquid movement from a landfill.

IEPA Groundwater Quality Assessment

The IEPA established a statewide groundwater monitoring network for community water supply wells in 1985. This program included the first comprehensive analyses for volatile organic chemicals (e.g., solvents) and inorganic compounds (e.g., heavy metals) in community wells utilizing groundwater. Over 2,600 of the community wells have been sampled and analyzed for these chemicals (see Figure 1). In addition, special monitoring has been conducted for synthetic organic compounds such as pesticides. Approximately 718 community wells have been sampled for pesticides or synthetic organic compounds (SOCs). The majority of these wells were selected on a random basis to represent principal aquifers.

The results of this sample program indicated that although in-situ aquifer quality is generally good, a number of naturally-occurring inorganic parameters (i.e., iron, manganese, TDS) exceed water quality standards. Twenty-four hundred of the 2,600 community water supply wells sampled for inorganic constituents are statistically summarized in Appendix A. This appendix clearly illustrates that many inorganic constituents occur naturally in Illinois groundwater resources.

The following information is indicative of the organic chemical groundwater contamination problems which were documented in Illinois community water supply wells:

- 115 community water wells have shown detectable levels of VOC/VOA chemical contamination based upon sampling and analysis performed by the IEPA over the past several years. This represents about 4.6% of the 2,600 community water wells which have been analyzed to date.
- forty-one of the 2,600 PWS wells or 1.6 percent exceed the USEPA final

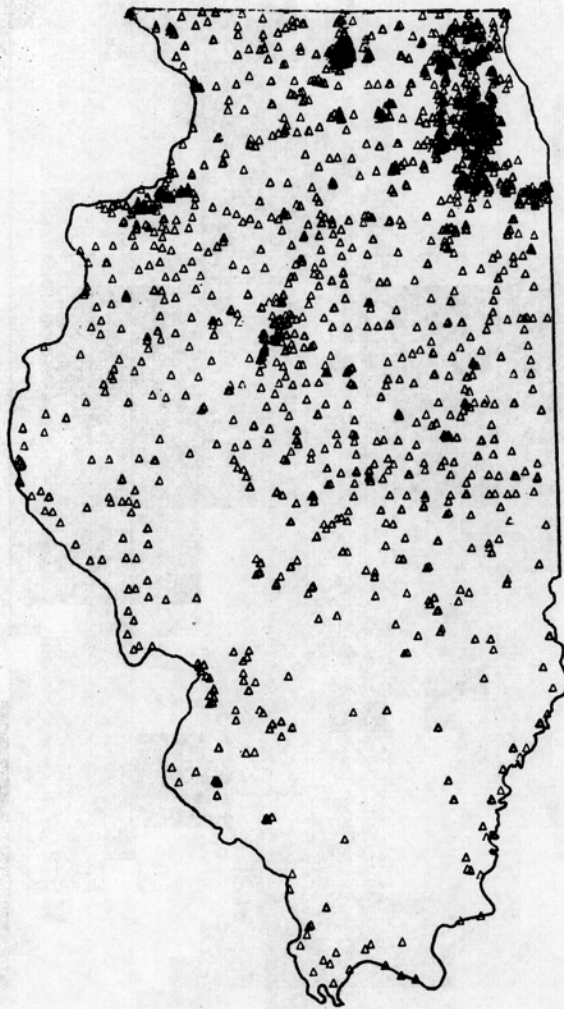


Figure 1

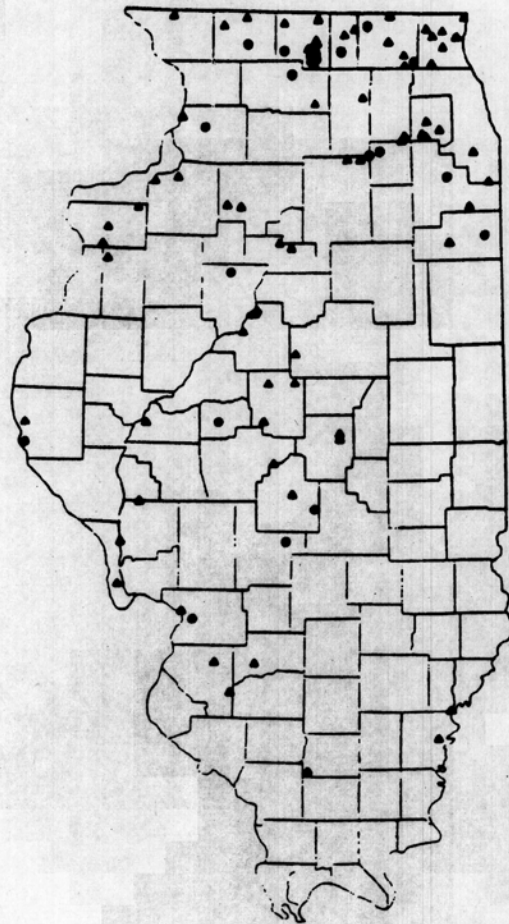
Public Water Supply Wells Tested for Inorganic and Volatile Organic and Aromatic Constituents

Figure 2

PWS Wells with VOC/VOA Detections

△ VOC/VOA Detections > 1ppb

● VOC/VOA > MCL



maximum contaminant level (MCL) or proposed MCL levels for one or more VOC/VOA contaminants (see Appendix B). Figure 2 presents the distribution of community water wells affected by VOC/VOA chemical constituents. These samples were taken at the wellhead, and do not represent PWS system compliance at points of entry to the distribution system.

- Sixteen wells or 2.2 percent have indicated detectable levels of pesticides. One of these wells has more than one pesticide constituent that exceeds a USEPA proposed MCL or drinking water standard. In addition, these levels exceed the new groundwater standards.

Figure 3 illustrates the location of these wells, and the following provides a description of these communities.

1. Union/York Public Water District (PWD)-Clark County - Monitoring results conducted by the Agency on both of Union/York PWD wells detected a maximum level of 0.03 parts per billion (ppb) alachlor.
2. Kirkwood-Warren County - The Village of Kirkwood has a PWS well contaminated with up to 0.17 ppb metolachlor.
3. Monmouth-Warren County - Analysis conducted on a PWS well located in the City of Monmouth has detected a maximum level of 0.250 ppb of metolachlor.
4. Plainville-Adams County - Monitoring results conducted by the Agency detected a maximum level of gamma chlordane at 0.012 ppb and up to 0.840 ppb of atrazine in one of Plainville's PWS wells.
5. Arenzville-Cass County - Monitoring results from both of the Village's PWS wells indicate atrazine and alachlor at levels up to 0.53 ppb.
6. Chandlerville-Cass County - The Village of Chandlerville currently has only one PWS well. Monitoring results of this well have detected a maximum level of atrazine at 4.8 ppb, metolachlor at 12.0 ppb, cyanazine at 4.5 ppb, and up to 18.0 ppb of alachlor. The USEPA drinking water standard and state groundwater standard for atrazine and alachlor are 3.0 and 2.0 ppb, respectively. The State of Illinois has provided a \$192,000 DCCA grant to Chandlerville to find an alternative source of water supply.
7. Forrest-Livingston County - Monitoring from the Forrest PWS indicated low levels of chlordane to 0.01 ppb.

8. Good Hope-McDonough County - Groundwater monitoring conducted at the Good Hope PWS detected maximum levels of 0.057 ppb of the pesticide alachlor.
9. Creve Coeur-Tazewell County - Monitoring results conducted by the Agency on a PWS well located in the Village of Creve Coeur has detected a maximum level of alpha chlordane at 0.012 ppb, gamma chlordane at 0.013 ppb, and up to 0.070 ppb of atrazine.
10. Mackinaw-Tazewell County - Monitoring results from one of the Village's PWS wells indicates atrazine at levels up to 0.23 ppb.
11. South Pekin-Tazewell County - Monitoring results from both of the Village's PWS wells indicate atrazine, alachlor, metolachlor and cyanazine reaching maximum levels of 1.2 ppb, 1.1 ppb, 2.2 ppb and 0.38 ppb respectively.
12. Heyworth-McLean County - Monitoring results from one of Heyworth's wells indicates trace levels of atrazine and alachlor.
13. Pleasant Hill-Pike County - Monitoring results from one of the Village's wells indicates atrazine and alachlor at up to 0.17 ppb and 0.08 ppb respectively.

FIGURE 3—PESTICIDES DETECTED IN PWS WELLS

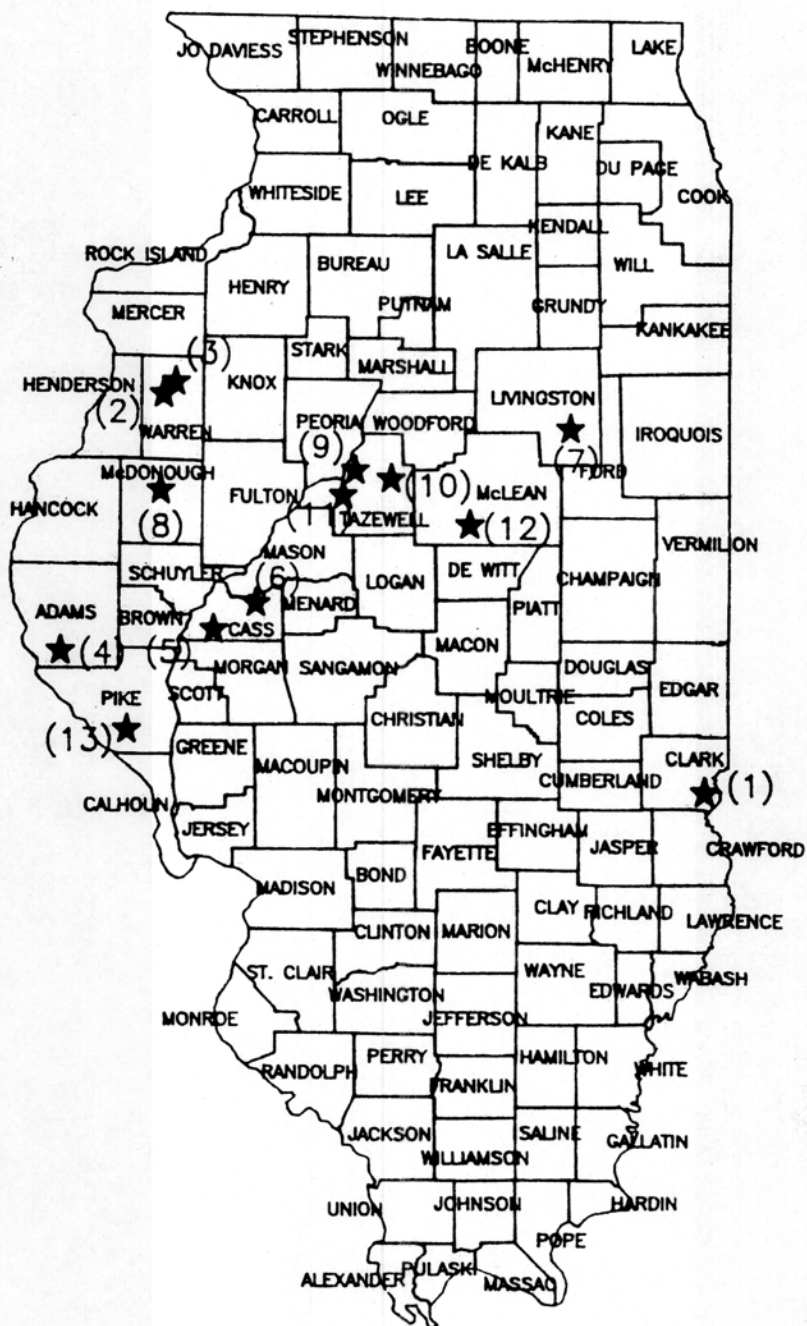


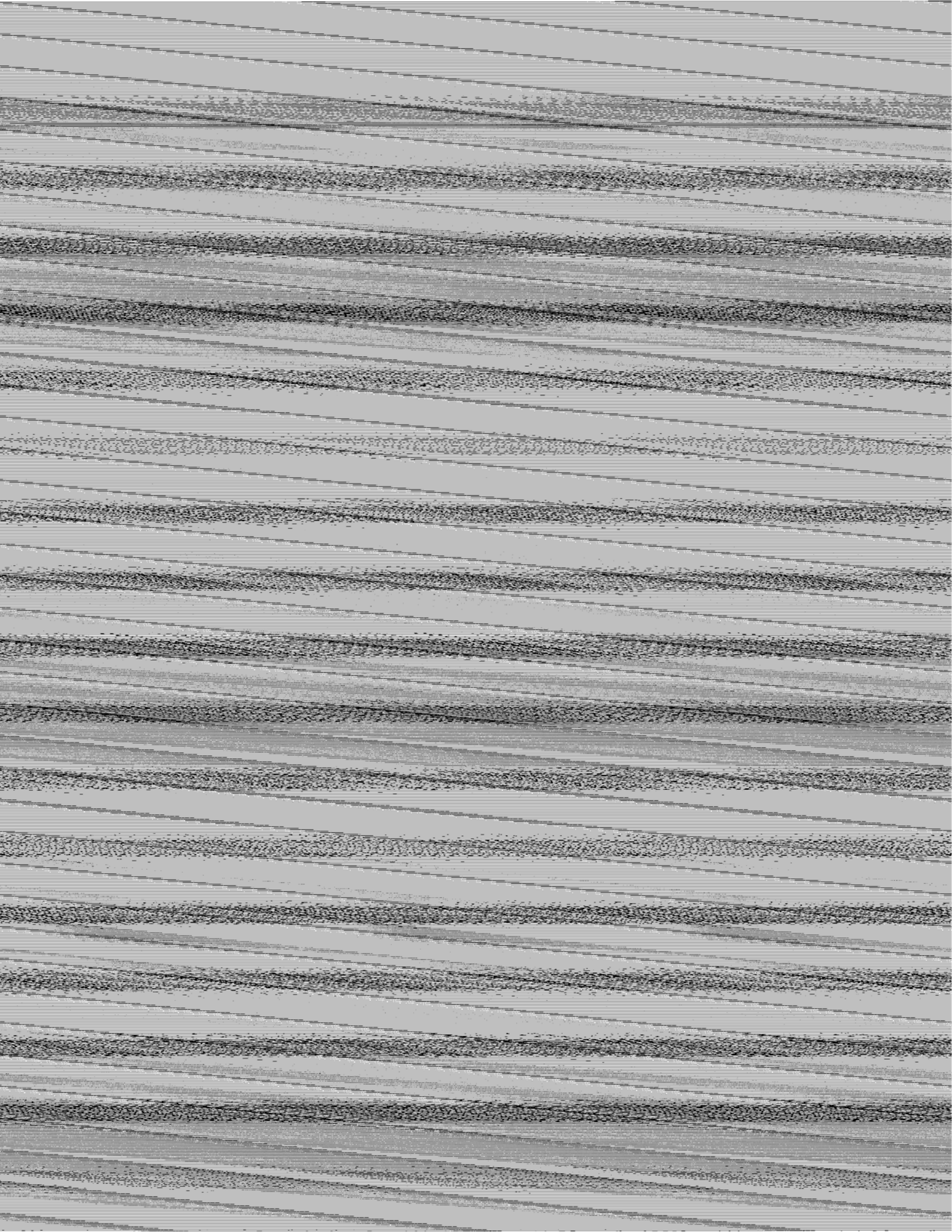
Table III summarizes the levels of detected pesticides in community wells

<u>Table III Summary of Pesticide Analyses in Groundwater</u>									
<u>Pesticide</u>	<u>No. of Wells Analyzed</u>	<u>No. of Detections</u>	<u>No. of Wells Per Detections</u>	<u>Concentration (ppb)</u>			<u>Percentiles</u>		
				<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>50%</u>	<u>75%</u>	<u>95%</u>
Alachlor	318	20	4	0.020	18.0	3.8	.54	6.5	12.0
Atrazine	319	27	7	0.050	4.8	0.89	.20	1.10	3.2
Cyanazine	317	9	5	0.050	4.5	1.21	.31	2.0	4.5
Metolachlor	317	15	3	0.100	12.0	5.21	3.5	7.7	12.0

(ppb - parts per billion)

The pesticide contamination of the sixteen community water supply wells can generally be attributed to relatively shallow wells located in moderate to high geologically susceptible areas. In addition, up to eleven of these wells have potential point sources (ag-chem mixing and loading operations) located within either the minimum setback zone (200 or 400 feet) or within a well site survey area (1,000 feet). Preliminary assessments and screening site inspections conducted by the Division of Land Pollution Control's Pre-remedial Program has identified potentially responsible parties (ag-chem mixing and loading operations) for six of the contaminated community water supply wells. For a summary of pesticides detected in public water supply wells, in relation to the information described above, refer to Appendix D.

For a detailed account of other organic chemical contamination problems at community water supply wells from ambient network testing conducted from 1985 - present, and Safe Drinking Water Act (SDWA) monitoring, and remedial response action taken by the IEPA to date, see Appendix E.



implemented in early 1982.

Groundwater Quantity, Use and Expansion Efforts

The issues of groundwater quantity, use and expansion were initially considered by the Illinois State Water Plan Task Force in the publication of the Illinois State Water Plan in January of 1984. This plan made numerous policy recommendations concerning the need for improved protection and management of the groundwater resources of the State. These policy level recommendations were reviewed and expanded on, at the request of the Governor's Office, by a committee of the Illinois State Water Plan Task Force. This Committee initiated its efforts to study groundwater quantity issues in March of 1988. After eleven months of study, the groundwater

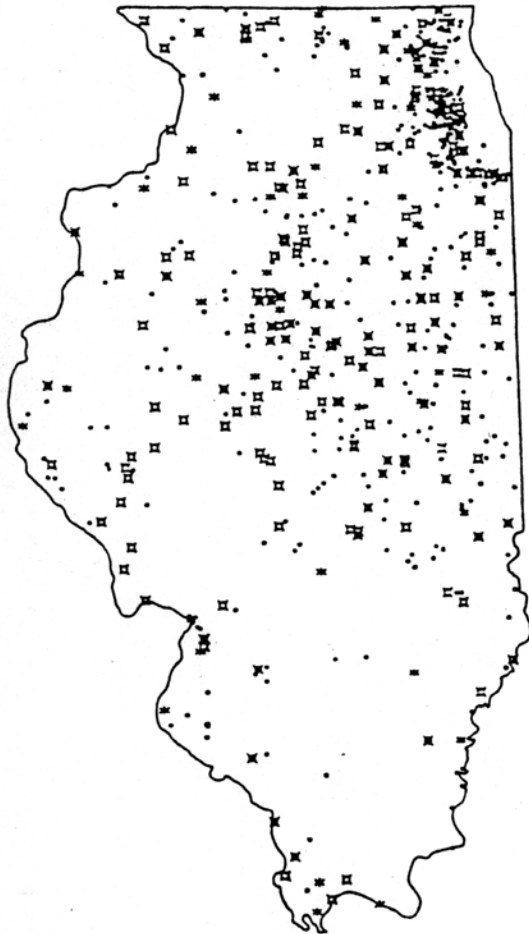


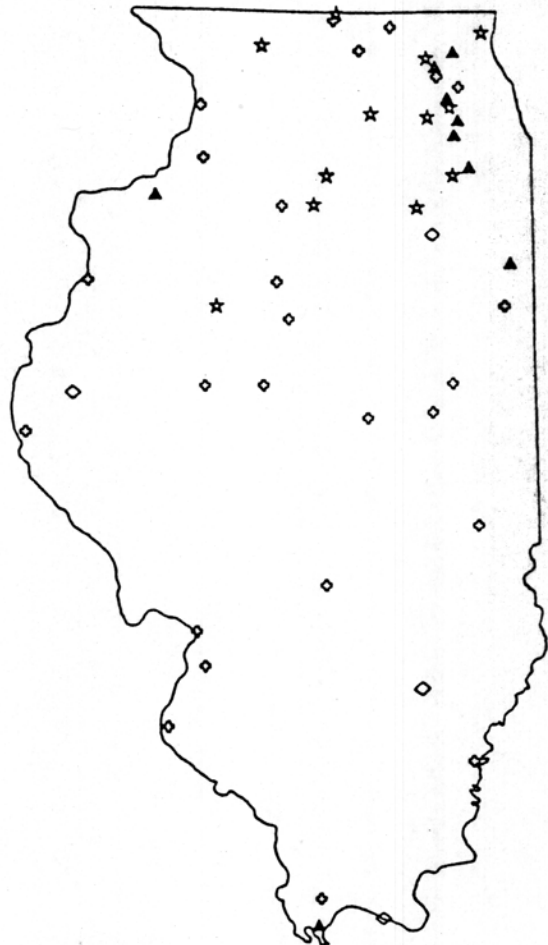
Figure 4

- Community Well Subnetworks
- Trend Subnetwork
 - ▣ Pesticide Subnetwork
 - One-Time Subnetwork

Figure 5

Community Well Trend Site Subnetwork

- ⊕ Quaternary
- ◇ Mississippian-Pennsylvanian
- ▲ Silurian
- ☆ Cambrian-Ordovician



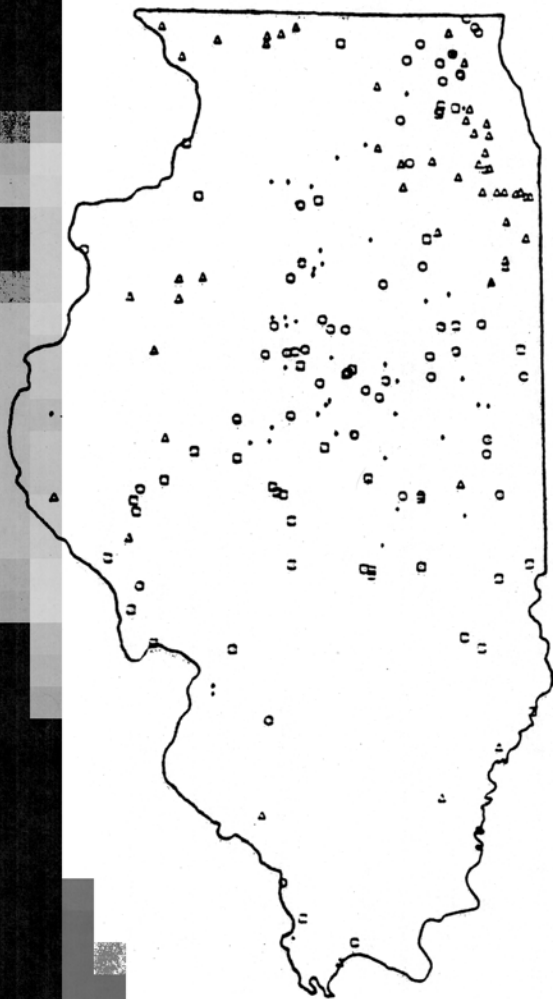


Figure 6

Community Well Pesticide Subnetwork

- Group A - rural, sand and gravel, >100 ft. deep, > 5,221 ft. from modern river
- Group B - rural, sand and gravel, <100 ft. deep, <5,221 ft. from modern river
- Group C - urban, sand and gravel, random by usage, no other restrictions
- Group D - bedrock, no other restrictions

Figure 7

Community Well One-Time Subnetwork



ONE-TIME NETWORK

quantity committee prepared a 200 page report describing twenty-three significant groundwater quantity issues in Illinois. The committee also developed a report on groundwater supplies versus demands in Illinois as well as legislative initiatives.

The groundwater quantity committee held public meetings on groundwater quantity issues in February of 1989 and worked with 18 interest groups during the spring of 1989 to develop acceptable legislative language to address the most pressing groundwater quantity issues. The administration and agencies continued to work with interest groups through the end of the 1989 spring legislative session without reaching an agreement on legislative language that was acceptable to all interests.

Legislative initiatives to address groundwater quantity issues were again considered by the administration, agencies and interest groups during the 1990 spring session. The legislature and interest groups continued the debate concerning groundwater quantity issues into the 1991 spring session. The main interest in groundwater quantity issues during the 1990 and 1991 sessions of the legislature centered on the proper form of authority and management powers that should be granted to locally organized special purpose groundwater management districts.

Since the late 1980's, ten special purpose groundwater management districts were formed in central Illinois. These districts were organized under the Water Authorities Act which was passed in 1951. The main purpose for the formation of these special water authorities was to protect local groundwater resources from the development of well fields by municipalities located outside the water authority. Presently, water authorities vary in size from single township to multi-county. It is anticipated that there will be a continuing interest in developing proper legislative revisions to the Water Authorities Act in upcoming sessions of the General Assembly.

COMPREHENSIVE WATER QUALITY STANDARDS FOR GROUNDWATER

Establishment of comprehensive groundwater quality standards is a critical component of the groundwater protection program. Such standards are ultimately necessary to provide a practical means of defining expectations for groundwater quality and determining the adequacy of the protection program.

In particular, groundwater standards are useful in four ways:

1. General water quality goals (e.g., drinking water) must be translated into chemical and microbiological parameters which can be monitored and analyzed. Using scientific "standards," we then have a way of determining the relative "goodness" or "badness" of actual groundwater around the State. Over time, we can also keep track of the progress being made to achieve or maintain desirable groundwater quality.
2. Certain facilities and activities need to be designed and operated so as to minimize the potential for contaminating groundwaters. Groundwater standards can be used to determine the performance expectations and characteristics of control technologies which are utilized. In setting such standards, one must work out many procedural details. For example, at what point or location do the standards become applicable to a facility or portions thereof? How does one sort out changes in background water quality as opposed to site related impacts?
3. Use of groundwaters at specific geographic locations, such as withdrawal of water from a well for municipal usage, should be compatible with the characteristics or suitability of such waters. Thus, determinations regarding the particular characteristics of quality to be ascribed to groundwaters has direct implications for the acceptable uses which may be pursued at some point.
4. Where significant contamination of groundwaters has occurred, water quality standards can be useful in setting site cleanup objectives. Such restoration of groundwaters often involves complex evaluations of applicable treatment technology, institutional mechanisms and economic implications of alternative cleanup scenarios. Central to these considerations are cost-effective decisions regarding the suitability of resultant groundwaters. As part of this process, standards serve as a necessary reference point.

Section 8(a) of the IGPA required the IEPA, after consultation with the Interagency Coordinating Committee on Groundwater and the Groundwater Advisory Council, to propose, and the Board to adopt within two years:

...comprehensive water quality standards for the protection of groundwater. In preparing such regulations, the Agency shall address, to the extent feasible, those contaminants which have been found in groundwaters of the State and which are known to cause, or suspected of causing cancer, birth defects, or any other adverse effect on human health according to nationally accepted guidelines...

After much evaluation, a specific group of constituents including pH, were selected to be regulated by groundwater quality standards. These were selected because they had health or welfare based limits according to nationally accepted guidelines. The recommended health criteria are primarily based upon federally adopted or proposed drinking water standards, while the remainder are based upon other uses such as irrigation and livestock watering. Taste and odor factors were also considered. The resulting chemicals listed in the regulation were also confirmed to be present in Illinois groundwater.

While the IGPA does not directly specify the subject matter to be contained in the proposed regulations, Section 8(b) of the IGPA does list the factors that the Board must consider when adopting these regulations:

- "1. recognition that groundwaters differ in many important respects from surface waters, including water quality, rate of movement, direction of flow, accessibility, susceptibility to pollution, and use;
2. classification of groundwaters on an appropriate basis, such as their utility as a resource or susceptibility to contamination;
3. preference for numerical water quality standards, where possible, over narrative standards, especially where specific contaminants have been commonly detected in groundwaters or where Federal drinking water levels or advisories are available;
4. application of nondegradation provisions for appropriate groundwaters, including notification limitations to trigger preventive response activities;
5. relevant experiences from other states where groundwater programs have been implemented; and
6. existing methods of detecting and quantifying contaminants with reasonable analytical certainty."

Development Process

The IEPA consulted and coordinated with both the ICCG and the GAC in preparing the proposed regulations. In addition, the ICCG formed a Groundwater Standards Technical Team composed of technical and scientific experts from various state agencies to help adequately respond to this complex task. Extensive dialogue between various interests also helped to more fully respond to the task.

The ICCG and the GAC provided extensive exposure to both the general public and interest groups. The GAC sponsored a Groundwater Protection Policy Forum on December 1, 1988 to foster dialogue on various technical and policy issues relating to groundwater protection and the groundwater quality standards-setting process. The ICCG developed "An Issues/Options Paper for Comprehensive Water Quality Standards" for Groundwater. The IEPA and the ICCG sponsored three public workshops across the state in regard to the Issues/Options Paper. After extensive input on these issues, the ICCG published a "Discussion Document for Comprehensive Groundwater Quality Standards." This document was intended to further facilitate the process of proposing standards.

The IEPA held a Regulatory Development Session on the "Discussion Document" with various business, environmental and other interest groups to assist in making the proposal reasonable but environmentally responsive. The IEPA, with guidance from the ICCG Technical Standards Team, developed a preliminary version of the proposal. Another Regulatory Development Session was conducted by IEPA to solicit specific input from various parties. The ICCG and GAC members were also participating in the review and revision of the preliminary package.

In September 1989, the proposed regulations were filed with the Board by the IEPA. The ENR filed the Economic Impact Statement ("EcIS"), on the Agency's proposal in January 1990.

An alternate proposal was filed on March 26, 1990 by the McHenry County Defenders, Citizens for a Better Environment, and the Illinois Chapter of the Sierra Club (collectively known as "Defenders"). In June, 1990 the IEPA filed its second proposal. Hearings on the various proposals and the EcIS were held on December 12 and 13, 1989, and February 14, March 29, and May 7, 1990. Based on the cumulative record then available, the Board on September 27, 1990 advanced its own proposed rule, which was published for first notice on November 2, 1990. Hearings were held on this proposal on December 4 and 5, 1990.

On February 19, 1991 the IEPA filed its third amended proposal, which the Board on February 28, 1991 proposed for First Notice as Docket B. Hearings were held on the Docket B proposal on May 30, 1991. At the hearings the Agency offered further amendments to the proposal based on renewed discussions, conferences, and negotiation sessions with interested persons. On July 25, 1991 the Board proposed the Docket B regulations for Second Notice. On October 22, 1991 the Joint Committee on Administrative Rules (JCAR) issued a certification of no objection to the rules, and the Board subsequently adopted them as a final Rule on November 7, 1991. The groundwater standards regulation became effective on November 25, 1991.

Summary of Standards

The groundwater quality standards provide protection for current and future beneficial uses of groundwater. The standards regulation (35 Ill. Adm. Code 620) is organized into six subparts as follows:.

1. Subpart A: General - This subpart sets forth the general provisions which include purpose, definitions, prohibitions, applicability aspects, exclusions and exemptions;

2. Subpart B: Groundwater Classification - This subpart describes the four classes of groundwater and groundwater management zones. All groundwater in the state falls into one of the following four classes of groundwater or a groundwater management zone:

- . Class I: Potable Resource Groundwater;
- . Class II: General Resource Groundwater;
- . Class III: Special Resource Groundwater;
- . Class IV: Other Groundwater.

a. Class I: Potable Resource Groundwater consists of all groundwaters that are located 10 feet or more below the land surface and that meet one of several criteria. Included in this criteria are current potable water wells and their associated minimum setback zone, geologic material descriptions, groundwater yield and hydraulic conductivity. Therefore, Class I provides protection to all current and future potable resource groundwaters. It is estimated that approximately eighty percent of the groundwater underlying the land surface in Illinois will be Class I groundwater.

The groundwater in Class I contained within 10 feet from land surface will be subject to Class II groundwater standards. This was provided to establish a zone of surficial interaction which arises from the need to recognize that many shallow activities can impact very shallow underground water without impacting the greater bulk of potable groundwaters.

b. Class II: General Resource Groundwater is groundwater which does not otherwise meet the provisions of the other classes. In addition, Class II groundwater is groundwater which the Board finds, pursuant to petition procedures, to be capable of agricultural, industrial, recreational or other beneficial uses.

c. Class III: Special Resource Groundwaters are groundwaters which are found by the Board to be demonstrably unique and suitable for application of a more stringent standard than would otherwise be applied. Additionally, Class III groundwaters found by the Board to be vital to a particularly sensitive ecological system or contribute to a dedicated nature preserve listed by the Agency. The standards for Class III groundwater will be established through a Board rulemaking on a case-by-case basis.

d. Class IV: Other Groundwaters are groundwater contained within the following:

- a zone of attenuation established for solid waste landfills;
- a point of compliance established for hazardous waste landfills;
- geologic formations which contain 10,000 milligrams per liter of total dissolved solids;
- a exempt aquifer designated by the Board under the underground injection program;
- under potential sources where a release has occurred and which is being controlled; or
- under a coal mine refuse disposal area.

Subpart B also allows for the establishment of groundwater management zones (GMZ) within any class of groundwater. A GMZ can be established where groundwater is being managed to mitigate impairment caused by the release of contaminants from a site. The GMZ provisions recognize the practical limitations commonly associated with remediating groundwater contamination, and links these practices and procedures with the standards regulation;

3. Subpart C: Nondegradation Provisions for Appropriate Groundwaters - This section establishes a narrative nondegradation standard for all resource groundwaters. In addition, this section establishes preventive notification and response procedures for the majority of Class I groundwater

or Class III groundwaters. The preventive notification process provides for detection of contaminants at the earliest possible point to prevent exceedence of groundwater quality standards set forth in Subpart D for Class I and III groundwater. In addition, preventive responses will be required within a set time frame to minimize the degradation caused by the release;

4. Subpart D: Groundwater Quality Standards - This section provides specific numeric standards which apply in groundwaters. Class I: Potable Resource Groundwater standards are primarily based upon USEPA maximum contaminant levels (MCLs). Class II groundwater standards are primarily based upon livestock, irrigation concerns and treatable levels for organic constituents. In addition, this Subpart contains alternate groundwater standards for groundwater being remediated within a groundwater management zone. This section also contains groundwater standards for coal mining;

5. Subpart E: Groundwater Monitoring and Analytical Procedures - This section establishes monitoring, analytical procedures, and points of compliance. Also specified are minimum requirements for monitoring wells, potable or other wells used for monitoring purposes. Monitoring and analytical procedures are also included for taking representative samples, water level readings and reporting requirements (i.e. sample collector, date, time, method of collection, location, sample shipment and preservation, analytical procedures and chain of custody); and

6. Subpart F: Health Advisories - Subpart F establishes a procedure for the IEPA to develop and issue a health advisory for chemicals or combinations of chemicals, that do not have a numerical standard established, which are detected and confirmed by resampling in community water supply wells. This health advisory process is consistent with USEPA procedures.

GROUNDWATER TECHNOLOGY CONTROL REGULATIONS

Section 14.4 of the Illinois Environmental Protection Act, as amended by Section 14.4 of the IGPA, required the IEPA to propose, to the Board, regulations pertaining to the following activities:

1. landfilling, land treating, surface impounding or piling of special waste and other wastes which could cause contamination of groundwater and which are generated on the site, other than hazardous, livestock and landscape waste, and construction and demolition debris;
2. storage of special waste in an underground storage tank for which federal regulatory requirements are not applicable;
3. storage and related handling of pesticides and fertilizers at a facility for the purpose of commercial application;
4. storage and related handling of road oils and de-icing agents at a central location; and
5. storage and related handling of pesticides and fertilizers at a central location for the purpose of distribution to retail outlets."

Section 14.4 required the Board to consider (1) appropriate programs for water quality monitoring; (2) reporting, record keeping and remedial response measures; (3) appropriate technology-based measures for pollution control; and (4) requirements for closure or discontinuance of operations at the activities described above.

On December 6, 1991 the Board unanimously adopted these regulations over an objection by the JCAR because the Board: did not agree that an undo burden would be placed on small business and that there would not be a duplication of DOA regulations; they had considered minimization of economic impact on small business; and by withdrawing the regulation, they would not be following the mandate of Section 14.4 of the Environmental Protection Act as based on the record of numerous hearings conducted over the two year rulemaking.

The intent of these groundwater technology control regulations are to establish standards and requirements for activities which were not addressed

by the setback provisions of the IGPA. Thus, the legislative focus was directed at specific activities that pose significant potential for producing groundwater contamination, and which are not otherwise currently subject to all of the groundwater protection requirements described in Section 14.4 of the IGPA.

Since these regulations will only apply to certain activities within setback zones regulated by the Act or within regulated recharge areas, the primary intent is to assure that all sources have appropriate monitoring, reporting, technology controls and closure requirements. The regulation consists of two parts, (35 Ill. Adm. Code 615) applies to existing activities located within minimum setback zones, maximum setback zones, or regulated recharge areas, while (35 Ill. Adm. Code 616) regulates new activities located in such areas.

AGRICULTURAL CHEMICALS AND GROUNDWATER PROGRAM

Introduction

The DOA continues to carry out its responsibilities as the State's lead agency for pesticide regulation. The DOA is a part of the ICCG and is the chair of the Pesticide Subcommittee of the ICCG. The concern about potential pesticide usage impacts on groundwater can be divided into two major components, namely, impacts from point sources (Storage sites, spills, backshipping events, etc.) and impacts from non-point sources (normal field or yard use).

Point source contamination of groundwater can occur when products or compounds are stored or handled in an unsafe manner and/or are allowed to escape into the environment. Two modes of action are available to address this problem, 1) the protection of storage and handling facilities to ensure these improper releases do not occur and 2) the proper remediation of these contaminated sites once a release has occurred.

The Statewide Survey for Agrichemicals in Rural Private Water Supply Wells, discussed earlier in the Groundwater Evaluation Section of this report, is an attempt at determining the current extent of groundwater contamination caused by agrichemicals resulting from both point and non-point sources (part of the overall mandate in the IGPA to continually assess the impact of pesticide usage on groundwater). The Agrichemical Facility Containment Program is an example of a regulatory program intended to reduce the potential for point source contamination. The development of an Illinois Pesticide Groundwater Strategy Plan is anticipated to be a comprehensive program to address the issue of non-point source contamination.

Agrichemical Facility Containment Program

On January 1, 1990 rules promulgated under the Illinois Pesticide and Fertilizer Acts to create the Agrichemical Facility Containment Program

became effective. The rules were developed by a committee of industry, university and government representatives to provide an environmental protection program for facilities handling and storing pesticides and fertilizers. The rules require facilities to install secondary and operational area containment systems, as well as utilized management practices, to avoid contamination.

All existing agrichemical facilities were required to register with IDOA by March 30, 1990. To date, approximately 1,290 facilities have completed the registration process. The information collected from the registration phase of the program gives an interesting picture of the industry. Over 81% of the 1,290 registered facilities are classified as commercial retail dealers, 7% are large lawncare operations, 6% terminals, 4% other (aerial applicators, manufacturers, and custom applicators) and 2% are noncommercial facilities (farmers). Over 60% of the facilities in Illinois handle bulk pesticides. Of those facilities, 90% currently have secondary containment in place to protect bulk storage tanks. Seventy-five percent of the registered facilities utilize bulk liquid fertilizer storage tanks. These storage tanks are not protected to the same degree as pesticide storage with 35% of the 946 facilities currently utilizing secondary containment structures. The large storage tanks which store over 100,000 gallons of liquid fertilizers present a unique challenge in environmental protection technology. At this time, there are 105 facilities statewide that have such structures. Forty-two percent of these facilities currently have some form of secondary containment protecting the large storage tanks.

Approximately 31% of the registered facilities are located within 1,000 feet of a community water supply well, five percent within 400 feet and two percent or 19 agrichemical facilities are located within 200 feet of a

community water supply well. These facilities are also required to meet not only the containment rules but also engage in ongoing groundwater monitoring pursuant to Section 14.4 of the IGPA. The registrations also indicate that many facilities use on-site wells for a water source. Water supply sources of agrichemical facilities include 43% private wells, 50% public water supplies and 7% other sources such as rivers and ponds. The number of facilities which had backflow protection in place at the time of registration number 351 or 28% of the facilities registered. Protection methods include both reduced pressure principle backflow preventors and fixed air gaps/break tanks.

The registration process was utilized by the DOA as a basis for issuing a compliance schedule unique to each facility. The variations in compliance deadlines are based upon the amount of containment provided at a facility prior to the adoption date of the rules. The first compliance date for any facility will be the submittal of a permit application. The permit application is a tool for the facility to convey to the DOA and IEPA staff the approach it will take to comply with secondary and operational containment systems for liquid agrichemicals and dry fertilizers. The remaining compliance dates are when the facilities must have these systems in place. For example, if a facility with liquid pesticides, liquid fertilizers and dry fertilizers had no containment in place as of January 1, 1990, the following would be the compliance schedule issued: Permit Application - January 1, 1991; Operational Containment - January 1, 1992; Secondary Containment for Liquid Pesticides - January 1, 1993; Secondary Containment for Liquid Fertilizers - January 1, 1994; Containment for Dry Fertilizers - January 1, 1995. The time frames would be slightly extended for containment systems in place prior to January 1, 1990. Non-commercial facilities must be in

compliance by January 1, 1995. The compliance deadline is extended further for liquid fertilizer tanks in excess of 100,000 gallons.

While containment systems are the visible, most discussed and most costly to a facility, management techniques and operational procedures associated with these systems are perhaps more important to the overall environmental protection plan of a facility. A containment system is only effective in environmental protection if it is properly managed and operated. The Rules address a wide range of concerns such as any accumulation of rainwater (in an outdoor structure) must be removed from the containment area after such rainfall event. The collected rainwater may not be discharged as stormwater unless the containment area was clean and free of agricultural residues. Contaminated stormwater must be collected and stored for reuse/recycling or proper disposal. Operational areas must be cleaned after any spill or leakage. At the close of each application season, the area must be thoroughly cleaned and inspected, including pits, sumps, pipes and structures. Empty pesticide containers and unwashed application equipment must be stored indoors or over contained areas to prevent contact and run-off from precipitation and washing. The Rules address all of these concerns, as well as many others and are all part of the permit documentation. The DOA field staff members are attempting to convey these requirements to facility managers during their initial site visits which are almost complete.

The DOA has received approximately 275 permit applications since the beginning of the program and has processed them accordingly. As of the preparation of these comments, approximately 40 permits have been issued. The other applications are currently in the review process, have been returned to the applicant for additional information, or have been denied due to lack of information. The following list describes the various phases that a typical

permit application goes through on its way to becoming an IEPA endorsed IDOA Agrichemical Facility Permit:

1. Receipt of the Application at DOA
2. Completeness review by DOA Staff to ensure all pertinent components are present. If components are missing, a Notice of Incompleteness is issued to the applicant and the application is returned. If the application is complete, within 3 days of receipt, one copy is forwarded to IEPA Water Division and a letter indicating such is sent to the Applicant.
3. DOA and IEPA conduct their separate technical reviews of the application. At IEPA, this may include both the Water and Air Divisions as well as their regional field staff. At DOA, this includes primarily the office staff and perhaps a visit by a field staff member to the site for clarifications, is necessary.
4. DOA/IEPA Joint Review Meeting. This has been done either in person or by telephone to assemble into a single document, a draft permit, endorsement, or clarify any questions either group may have regarding the application. If there are no questions, a permit and endorsement are issued to the applicant.
5. Additional Information Letter. If there are questions, an Additional Information Request Letter is sent to the Applicant with a detailed description of the deficiencies of the application.
6. DOA Receipt of Amendments to an Application. Upon receipt of a response to an Additional Information Request Letter, DOA and IEPA review the amendments and prepare either a permit and endorsement or a second additional information request letter.

A major component of any regulatory program is its enforcement structure. The DOA has the ability to conduct administrative hearings in lieu of submitting cases to the court system in most circumstances. The

administrative hearing process streamlines enforcement cases and allows both the facility and the DOA to take actions and move forward. To date, very few violations of the Containment Rules have resulted in an administrative hearing. The hearing has been viewed as a last resort in encouraging a facility to comply with rules and regulations. Failure to register by the April 30, 1990 compliance date is the most common violation. Another type of violation that the DOA is encountering in increasing numbers is failure of a facility to acquire a permit prior to construction of secondary or operational area containment systems including construction to upgrade a facility. While it is encouraging that facilities want to move ahead with environmental protection systems, it also raises much concern since the Rules are specific regarding the standards or guidelines under which systems are constructed. The permit application allows the DOA and IEPA to verify that construction efforts are in compliance thus averting any unnecessary construction which might not meet the regulatory requirements. The DOA is also currently pursuing changes to the Illinois Pesticide Act which would create monetary penalties for various violations of the containment rules. These monetary penalties would allow the department more latitude in the solution of violations than is currently allowed by statute. Currently, statutory penalties consist primarily of orders to stop sale and/or use and the revocation of licenses and permits.

The Agrichemical Facility Containment Program attempts to address the concern for the protection of bulk storage facilities. Both catastrophic tank failures and product releases which may occur over a period of years due to incidental operational spillage are addressed in this program which is designed to ensure the safe storage and handling of agrichemicals at sites in Illinois.

Statewide Survey for Agrichemicals in Rural Private Water Supply Wells

The release of the USEPA National Pesticide Survey Results and results of similar studies by various states has increased the concern regarding potential groundwater contamination from the non-point or normal field application of agrichemicals. Recognizing this concern coupled with other issues raised by USEPA which will be discussed later, a survey has been planned to address some of these issues. The purpose of the study is to provide the first statistically valid statewide estimates of the occurrence of pesticides and nitrates in rural, private water wells in Illinois. The survey is being conducted by DOA and the University of Illinois Cooperative Extension Service (UICES) with technical assistance from the Illinois State Geological Survey (SGS). Groundwater samples will be collected from approximately 350 randomly selected wells across the state. Sampling began in the spring of 1991 and continues through the spring of 1992. The well water samples will be analyzed for nitrates, nitrites, and 40 pesticides at the DOA laboratory in Springfield. The pesticides will be selected based on usage in Illinois and potential for leaching into groundwater. The results of this study will provide the State with an estimate of the occurrences of pesticides in rural private water supply wells resulting from both point and non-pont sources. Extensive descriptions of each well, the surrounding land areas and pesticide and fertilizer application activity histories are also a component of the study allowing for the investigation of causes associated with each occurrence of analytes in well water samples.

Development of an Illinois Pesticide Strategy Plan

A Subcommittee of the ICCG was created in 1990 to develop and propose to the ICCG, a Pesticide Management Strategy to respond to the detection and confirmation of pesticides in groundwater. The Illinois Department of

Agriculture, as the State's lead agency for pesticide regulation, chairs the Subcommittee. The Subcommittee currently includes the following agencies:

Illinois Department of Agriculture (DOA)

Illinois Environmental Protection Agency (IEPA)

Illinois Department of Public Health (DPH)

Illinois Department of Energy and Natural Resources (ENR):

Illinois State Geological Survey (SGS)

Illinois State Water Survey (SWS)

Illinois Natural History Survey (NHS)

United States Department of Agriculture (USDA):

Soil Conservation Service (USDA-SCS)

University of Illinois Cooperative Extension Service (UICES)

The United States Environmental Protection Agency (USEPA) recently finalized on October 17, 1991 their "Pesticide And Ground-Water Strategy" which calls for the development and implementation of a State Pesticide Management (SPM) strategy. SPMs will be a requirement for the continued registration and use of pesticides with the potential to leach to groundwater. USEPA also indicated that four additional documents to assist in the development of pesticide management plans will be available approximately 5 months after the issuance of the strategy and plan guidance. These four documents are as follows: 1) state plan approval process, 2) evaluation, 3) groundwater monitoring, and 4) appropriate state responses to contamination. Each of these documents will be very useful in aiding the subcommittee and ICCG in the development of the Illinois plan. The subcommittee has considered all the drafts that have been issued and has attempted to construct a plan skeleton based on three components, namely, 1) mapping of aquifer vulnerability to pesticide contamination, 2) monitoring of groundwater for the incidence of pesticide contamination as a result of normal field application,

and 3) management/enforcement of the plan.

Vulnerability Mapping-Aquifers, as defined in the Illinois Groundwater Protection Act, must be the focus of the state's pesticide management strategy. Also, the operational definition of aquifer used by the Illinois State Geological Survey is utilized, that is an aquifer is sand or gravel > 5 feet thick, sandstone > 10 feet thick, and fractured carbonates > 20 feet thick, loess, glacial diamicton, shale, and non-fractured carbonate rocks are not considered aquifers. This definition does not include saturated earth material that are the source of water for shallow, large-diameter wells.

The stack-unit map of Illinois (Berg and Kempton, 1988) should be the source for information on the distribution of earth materials in Illinois. The scale and accuracy of this map are appropriate for use in targeting educational and technical assistance programs and for designing monitoring programs, but are not adequate for regulating pesticide usage on individual fields. The stack-unit map was published as a set of four plates at a scale of 1:250,000 and updated versions are available on the Geographic Information System (GIS) at the SGS. These maps depict the vertical and horizontal distribution of earth materials to a depth of 50 feet. The minimum thickness of continuous mapped units is 5 feet, except where a unit less than 5 feet was mapped over at least 0.4 square miles (Berg and Kempton, 1988). Where a mapped unit is laterally discontinuous within the specified area, the unit is frequently less than 5 feet thick. Generally, the mapping is assumed to be 75 percent accurate, that is, in 75 out of 100 cases, the sequence of materials is as designated on the map. The availability of subsurface data varies across the state. Consequently, the accuracy of the map will also vary. The maps are most accurate in describing geologic conditions within the upper 20 feet.

For short term mapping needs, the rating scheme used by the SGS and SWS (Berg, Kempton, and Cartwright, 1984) should be applied. This system provides relative ratings of the potential for aquifer contamination based on the hydraulic conductivity and thickness of geologic materials overlying the aquifer. The highest potential for contamination of aquifers from agricultural chemicals is in areas where the top of the aquifer materials lies within 5 feet of land surface. Principal areas are north-central, northwestern, and extreme southern Illinois.

The next highest potential for contamination of aquifers is in areas where the top of the aquifer materials lies between 5 and 20 feet from land surface. These areas have a continuous deposit(s) of relatively fine-grained materials overlying highly permeable aquifer materials. Principal areas are northern, southern, and extreme western Illinois.

The third level of contamination potential is assigned to areas where aquifer materials lie between 20 and 50 feet from land surface. These areas have at least 20 feet of fine-grained material overlying highly permeable deposits. Although these sequences occur throughout Illinois, they are concentrated mainly in the western, south-central, and southern parts of the state.

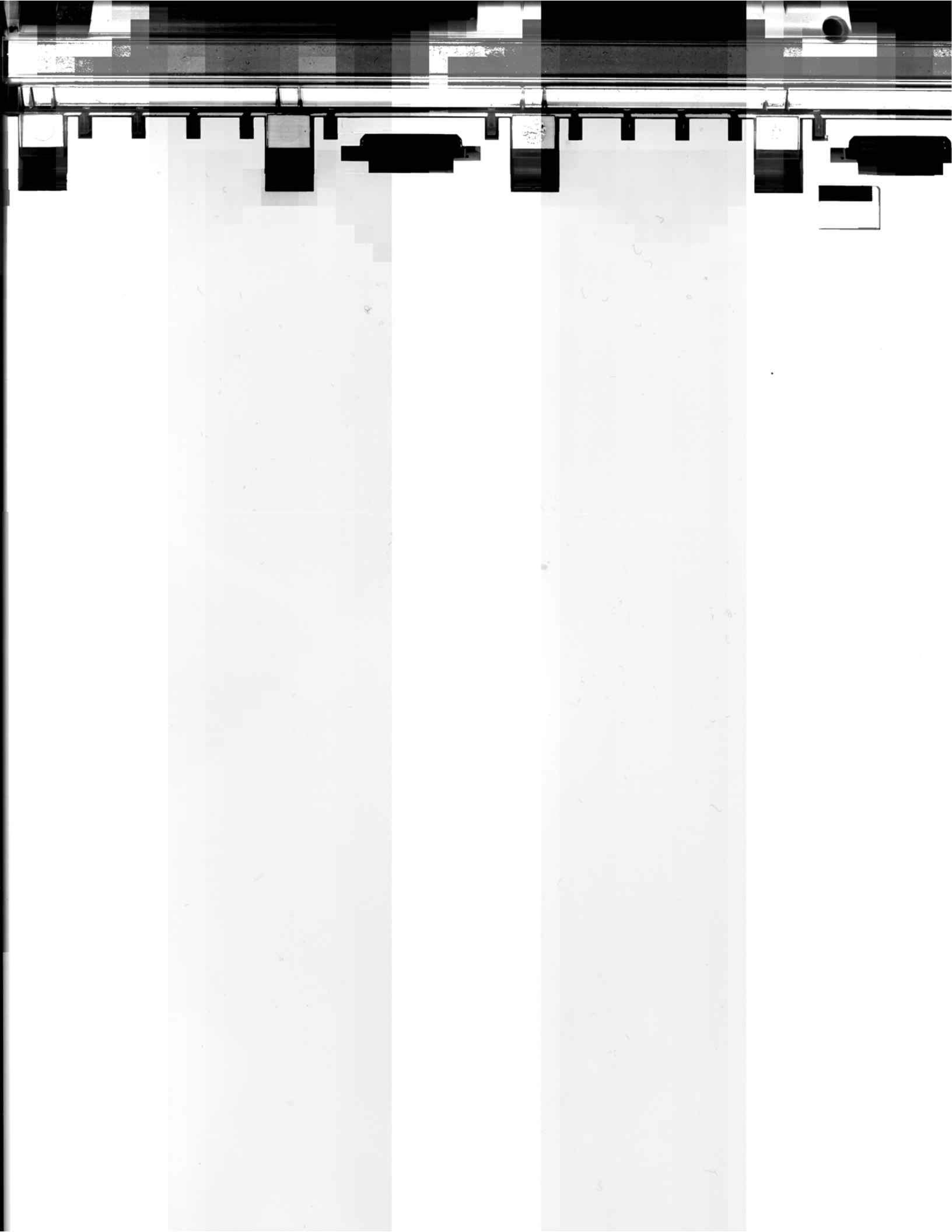
Areas mapped as having the lowest potential for contamination of aquifers have no continuous aquifers within 50 feet of land surface. These areas are underlain by at least 50 feet of fine-grained glacial deposits or low permeability bedrock. Every county in Illinois contains geologic sequences like these, but the greatest areal coverage occurs in northeastern and central Illinois.

The highest priority for digitization of county-level soil survey maps should be areas of the state where geologic mapping and interpretations have identified aquifers vulnerable to contamination. These highly vulnerable

areas should also have high priority for detailed geologic mapping and groundwater monitoring.

DOA has contracted with the SGS and SWS to develop statewide and county map products related to the potential for groundwater contamination by agrichemicals based on the above mentioned parameters as well as irrigated acreage in Illinois. DOA and SGS are also working with USDA-SCS on the incorporation of these maps with USDA-SCS Hydrologic Unit Maps to investigate these units as a starting point for the incorporation of management practices on the land. All maps will be produced using the ENR Geographic Information System (GIS) to allow for full integration of all final maps. The initial map products were completed during 1991.

Monitoring-Ambient/statewide sampling and monitoring have been discussed within the committee. The SGS/SWS Pilot Project and the DOA/UICES/SGS Statewide Survey for Agrichemicals in Rural Private Water Supply Wells are examples of the ambient/statewide sampling programs that are needed to establish benchmarks and generally test the proposed mapping programs. The results from these surveys will be very useful in selecting the compounds of interest for the initial monitoring phase of the program. Monitoring may require a permanent network of wells that would include rural residence, dedicated monitoring, and farmstead wells in high vulnerability areas. Product manufacturers may also have a role in the monitoring program. They may be invited to voluntarily participate at one level of the management strategy and be required to participate as a condition of continued state registration at another when more extensive monitoring is necessary such as when the State has determined that a product has caused contamination. Design and frequency would be on a compound specific basis at the request of the State and include State approval, quality control, and assurance. The



subcommittee is currently considering a monitoring and decision making scheme which acts as a subnetwork of the management/enforcement scheme discussed in the following section.

The scheme is based on vulnerability area and is driven by a groundwater sample result which might originate with either a private or state agency sample. These samples may ultimately result in some enforcement action but each has a different route. Private sample results would be obtained through a reporting requirement that the committee suggested be mandated by law. Private samples would have an automatic resampling requirement before the characterization phase while an agency sample may not. At the characterization phase, the determination of point source versus non-point source would be made. This determination would be based on specific activity and event/distance criteria. If the contamination was determined to be the result of a point source, appropriate good management practices (GMP's) would be instituted which might include additional DOA intervention. If the contamination was determined to be the result of a probable non-point source, the manufacturer would be notified that detections had occurred and that their involvement in identifying the extent of the problem was invited. Neighboring wells and monitoring wells would be sampled to determine whether the problem was local or regional in nature. If only a local problem, GMP's would be implemented and their effectiveness monitored. If, however, a probable non-point source is characterized as a regional problem, the manufacturer would be required, as a condition of continued state product registration, to participate in the monitoring of GMP effectiveness. Also, a regional problem would require the implementation of monitoring in the next lower vulnerability level area.

The following 11 agrichemicals are suggested to be the initial primary targets for monitoring. These represent current high use compounds and/or compounds which have been found in various studies to have impacted groundwater. The results of the SGS/SWS Pilot Study and the DOA/UICES/SGS Statewide Survey may allow expansion or contraction of this initial list.

<u>Common Name</u>	<u>Trade Name</u>
alachlor	Lasso, Bronco (+ glyphosate)
atrazine	Atrazine, Aatrex
carbonfuran	Furadan
clomazone	Command
cyanazine	Bladex
fonofos	Dyfonate
imazaquin	Scepter
metolachlor	Dual, Turbo (+Metribuzin)
metribuzin	Lexone, Sencor
trifluralin	Treflan
nitrate	

Management/Enforcement - The overall strategy of the pesticides in groundwater program is proposed to combine both voluntary and non-voluntary practice changes coupled with a major educational effort. The ability to mandate these types of practice changes will also certainly require legislative activities.

The proposed management plan consists of four steps from the initiation of sampling through the cancelation of the compound use in a vulnerability area. Upon the detection of a compound in groundwater and the determination that its presence is due to non-point sources, voluntary good management practices are proposed and a call for their implementation is made. These practices are primarily voluntary application rate reduction and change to other lower risk compounds. Other possible GMP's are noted in the following section and require further study by the committee. If continued sampling indicates increasing frequency of detects and increasing concentrations, mandatory GMP's would be required for continued product use. These GMP's would include rated

reduction or perhaps rotational application of the problem compound. At this point, the initial monitoring phase (Step 1) would be instituted in the next lower level vulnerability area. If after a period of (?) years no reduction of concentration levels are detected and confirmed, the cancelation of product use would occur.

Both voluntary and non-voluntary rate reductions are specifically noted in the management plan as Good Management Practices (GMP's). There are several other practices that may be possible GMP's and are currently under study by the subcommittee.

WELLHEAD PROTECTION PROGRAM

In the long run, groundwater protection needs to be more prevention-oriented to be truly effective since full restoration of groundwater quality can be very difficult and costly once contamination occurs. Under the IGPA, drinking water supplies (public and private) receive protection from potential routes and sources of groundwater contamination by use of setback zones. Such protection regulates the spatial relationships between water supplies and potential contamination routes and sources. In all cases, existing water supply wells are protected from encroachment by new potential routes or sources of contamination. In a like manner, new water supply wells may not be located so as to create a threatening situation with respect to existing potential routes and sources. This approach ensures a baseline program that will prevent or greatly lessen the likelihood of well contamination by the most direct means.

Under Section 1428 of the Safe Drinking Water Act (SDWA) as amended in 1986, states were required to prepare and submit a Wellhead Protection Program (WHPP) to the United States Environmental Protection Agency (USEPA). The elements of a WHPP prescribed in the SDWA are as follows:

- Program purpose and summary
- Duties of state agencies, local governments and public water supply systems
- Delineation of WHPA's
- Source identification
- Management approaches
- Contingency plans
- New wells
- Public participation

In accordance with SDWA, the IEPA submitted a draft WHPP on June 19, 1989. The IGPA is the basis upon which the Illinois WHPP is built. Illinois was the first state in Region V, and one of twenty-seven states nationwide to submit a WHPP within the time frame specified by federal statute. The IEPA worked closely with the SWS to perform case study analyses and develop this WHPP submission for USEPA review.

The USEPA evaluates each state's WHPP submittal to determine whether it is fully adequate to protect public water supply systems from contaminants that may have an adverse effect on public health. USEPA fully approved the Illinois WHPP on September 27, 1991. Illinois is the first state in Region V to receive USEPA approval of its WHPP.

Minimum Setback Zones

The first level of protection provided under Section 14.2 of the IGPA involves the use of a minimum setback zone for community and private water supply wells and potential sources and routes. The minimum zone is 200 feet in radius for any type water supply well or potential sources or routes. Therefore, minimum setback zones apply to new wells and new sources or routes. The setback zones determine the allowable distances between potential sources and routes and drinking water supply wells. However, for community water supply wells tapping certain vulnerable geologic formations, the minimum zone is expanded to 400 feet in radius. The setbacks are applied as lateral distances on the land surface and are measured between a potable water supply well and a potential source or a potential route.

The 200 or 400 foot minimum setbacks are in effect for all new sitings unless any of the following apply:

- A waiver has been provided by a well owner other than a community water supply well.
- An exception has been granted by the Pollution Control Board pursuant to Section 14.2(c) of the Act.

- Certain new potential routes, such as excavating for stone, sand or gravel relative to water wells, in existence prior to January 1, 1988 (Section 14.2(h)).
- New common sources of sanitary pollution (e.g. septic systems, sewer lines, etc) shall follow regulations in effect (Section 14.2(e)).
- Certification which confirms a minimal hazard to groundwater by potential primary and secondary sources (Section 14.5).

A comprehensive community water well location effort has been completed by the IEPA. Field verified well locations have been mapped and data has been placed in a computerized data base. The IEPA and ENR developed the community water well susceptibility procedure to determine the minimum setback zone. The IEPA developed an automated Setback Zone Directory and notified all owners of community water supplies of the setback zone requirement. A confirmation notice was also given. One thousand six hundred eighty four community wells have 200 foot minimum setback zones and 1,819 community wells have 400 foot minimum setback zones. All permit authorities of IEPA are implementing the minimum setback zone provisions.

The IEPA developed "A Primer Regarding Certain Provisions of the Illinois Groundwater Protection Act". This primer was intended to provide local officials, consultants, and the public with a better understanding of the IGPA and its particular significance to community groundwater quality protection. Nearly 20,000 copies of this document have been released. Numerous responses have been provided to local government questions and concerns. Further details can be found in the Education Program summary.

Maximum Setback Zone

The second level of protection provided under Section 14.3 the IGPA involves the use of a maximum setback zone for community water supply wells. This maximum zone may be established up to 1,000 feet from the wellhead of a

community water supply well maximum setback zones prohibit the siting of new potential primary sources of contamination up to 1,000 feet. Based upon well drawdown characteristics, counties and municipalities may, by ordinance, establish a maximum setback zone. After July 1, 1989, the IEPA may also initiate rulemaking before the Pollution Control Board to establish such a zone. During 1991 the Agency notified five water supplies that it intends to propose maximum setback zone regulations to the Board for their wells. Two of these communities have opted to establish maximum setback zones through local ordinance.

This extra protection is only available for community water supply wells and is based upon pumping test and estimation techniques adopted in Board regulations (35 Ill. Adm. Code 671). A request to determine the technical adequacy of a maximum setback zone determination must first be submitted to the IEPA by a county or municipality. After the IEPA confirms the technical adequacy of the determination, a county or municipality is authorized to establish a maximum setback zone ordinance under the authority of the Act. Thus, for local governments the establishment of a maximum zone remains a voluntary process.

The IEPA has also published a "Maximum Setback Zone Workbook" and companion brochure which describes the maximum zone program and its benefits to the community water supply, and provides examples of how to establish maximum zones.

The IPGA also provides for expansion of the 1,000 foot maximum setback up to 2,500 feet in special cases. A community water well is eligible for a maximum setback zone up to 2,500 feet when the well is utilizing an alluvial

aquifer, and the wellhead is within a 1,000 feet from Public Waters⁽¹⁾. The additional protection out to 2,500 feet prohibits the siting of new potential routes of contamination. The Cities of Jacksonville and Athens have passed 2,500 foot maximum setback zone ordinances.

To date the following local governments have passed maximum setback zone ordinances.

- Pleasant Valley Public Water District (Peoria County)
- Princeton (Bureau County)
- Marengo (McHenry County)
- Jacksonville (Morgan County)
- Marshal (Clark County)
- Athens (Menard County)
- Edwardsville (Madison County)
- Harvard (McHenry County)
- Sadorus (Champaign County)
- Alhambra (Madison County)

Additionally, twenty-four communities have maximum zone ordinances which are pending, currently undergoing technical review by the Agency, or being proposed by the Agency for Board rulemaking.

Quarterly Wellhead Protection Status Report

In April, 1991, the IEPA began publishing the "Quarterly Wellhead Protection Status Report" (QWPSR). This report serves as a regular public update regarding the status of efforts by local governments to adopt maximum setback zones. The QWPSR is intended to encourage the establishment of maximum setback zones. The QWPSR classifies communities into one of four categories: (1) maximum setback zones adopted; (2) adoption of such zones pending (those currently awaiting the Agency's determination of technical adequacy as well as those awaiting local zoning approval); (3) no

¹ "Public Waters" means any body of water that is or was navigable and is open or dedicated to public use (section 18 of an Act in relation to the regulation of rivers, lakes, and streams of the State of Illinois, approved June 10, 1911).

maximum zone application on file; and (4) local decision not to adopt an ordinance. For each entry in category 3, a number in parenthesis following the name will be used to identify the total quarters in that status. This classification will be based upon review of responses to written inquiries sent to each local government which has received a well site survey report.

The initial inquiry to each community is sent six months after receipt of the community well site survey report. If a community fails to respond, then the Agency will assume that the status has not changed since the previous quarter. In essence, this reporting system will be used as a management tool to ensure steady progress with the maximum setback zone program.

The implementation of the QWPSR program has proven successful. In 1991, the Agency received maximum setback zone applications from 25 community water supplies. Twenty-one of these applications were received after the QWPSR process was initiated in April of 1991. Figure 8 illustrates the progress made after the QWPSR program was initiated. Additionally, Figure 9 shows the number of wells represented by community maximum zone applications.

Well Site Survey Program

Section 17.1 of the IGPA requires the IEPA to conduct a well site survey program of all the community water supply wells in the State. (See Figure 10). Well site surveys provide an inventory of potential sources, routes and other activities within a 1,000 foot survey area. The IEPA compiles the field information for each well and prepares a formal report for each community water supply. Each well site survey report provides recommendations to the facility based upon the information discovered through the survey process. The well site survey report also contains basic hydrogeologic information about each community well such as depth, age, general surficial geologic

FIGURE 8—PROGRESS MADE AFTER INITIATING THE QWPSR PROCESS, NUMBER OF COMMUNITIES WITH MAXIMUM SETBACK ZONE APPLICATIONS

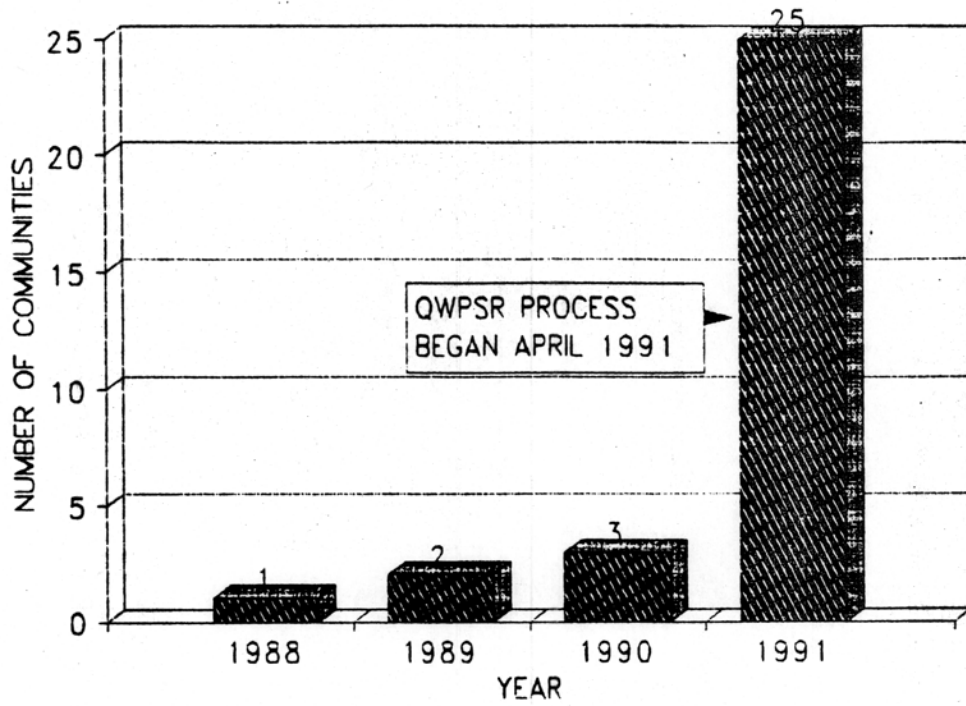


FIGURE 9—PROGRESS MADE AFTER INITIATING THE QWPSR PROCESS, NUMBER OF WELLS WITH MAXIMUM SETBACK ZONE APPLICATIONS

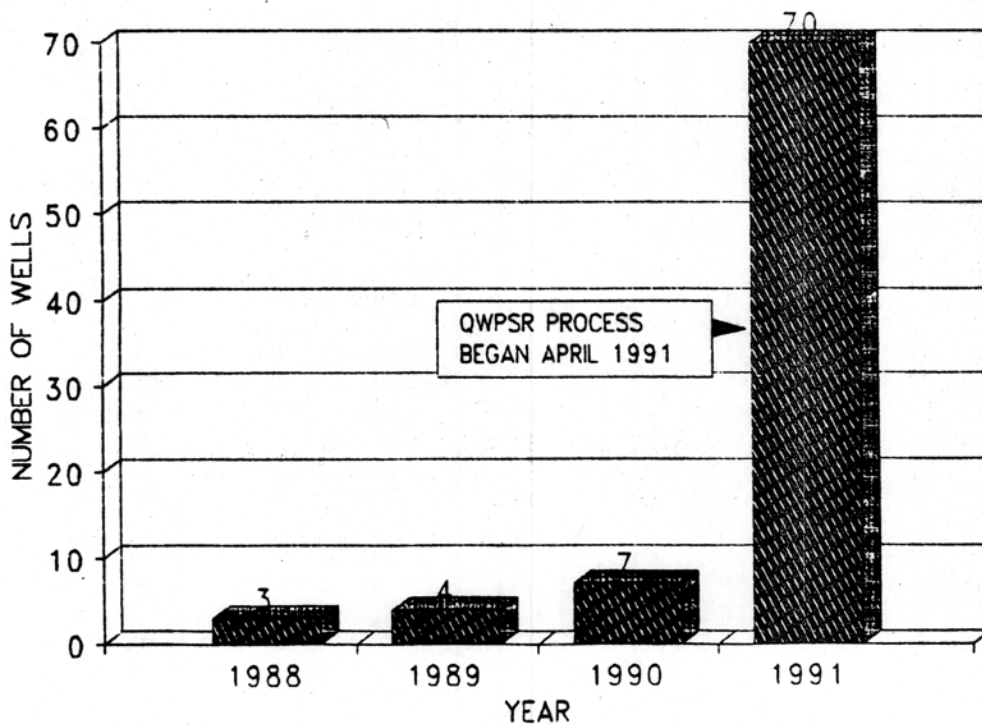
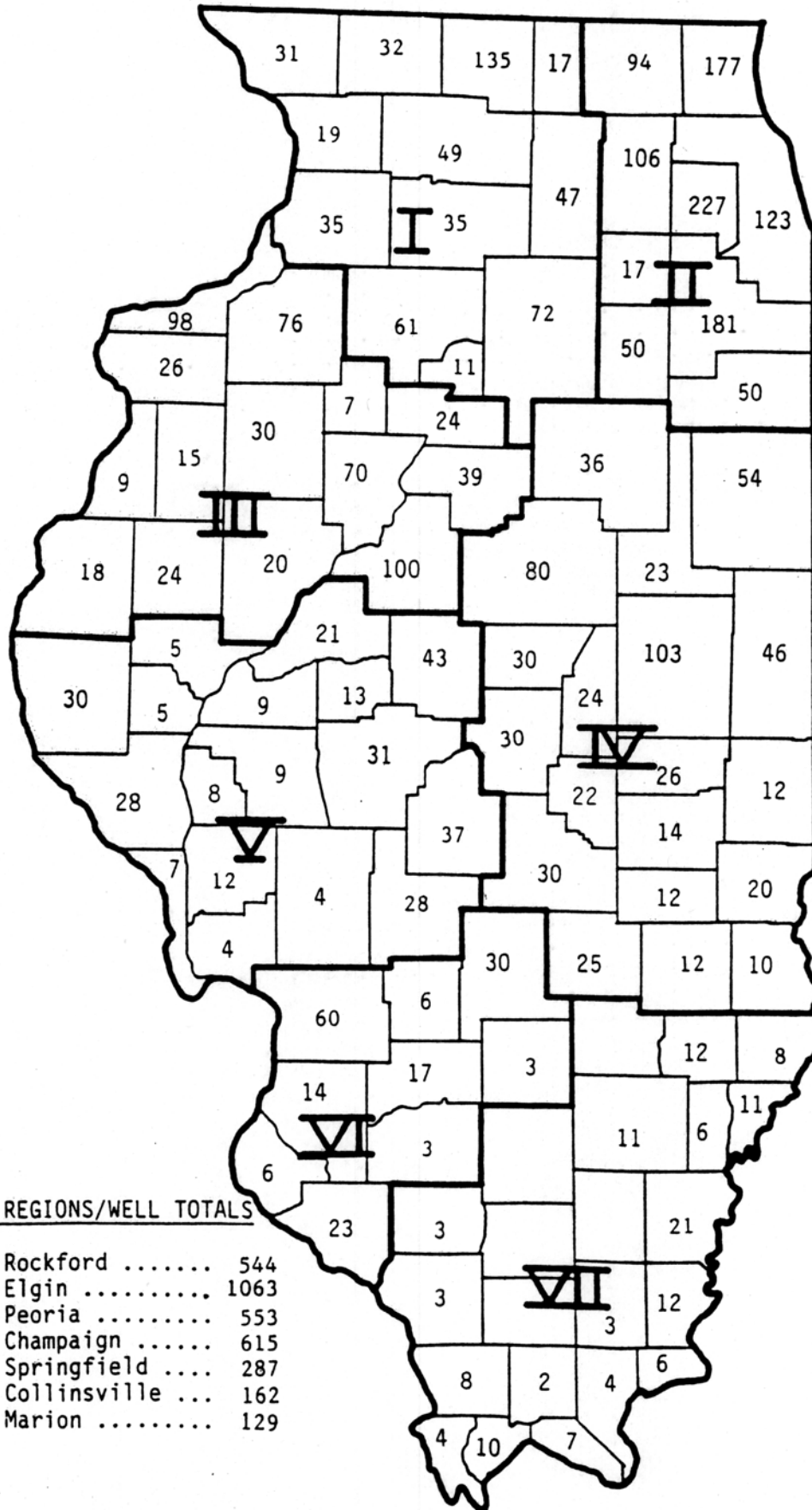


FIGURE 10—ILLINOIS EPA REGIONS AND THE TOTAL NUMBER OF COMMUNITY WATER WELLS PER COUNTY



ILLINOIS EPA REGIONS/WELL TOTALS

Region I - Rockford	544
Region II - Elgin	1063
Region III - Peoria	553
Region IV - Champaign	615
Region V - Springfield	287
Region VI - Collinsville ...	162
Region VII - Marion	129

susceptibility, geologic well logs, well construction details, and aquifer utilized. Additionally, the report contains a summary of the groundwater chemistry. This information can be used by the community to begin establishing a groundwater protection program.

Since beginning the well site survey program in 1988 the IEPA has made significant progress. The Agency has surveyed 3,353 community wells or has completed 82 percent of the total number of well site field surveys. In addition, the Agency has completed 782 well site survey reports which represents approximately fifty-four percent of the total number of reports to be completed. Figure 11 illustrates the progress made on the well site survey program on a geographic basis. This figure indicates the total number of community wells in each county relative to the number of surveys completed. Figure 12 indicates the IEPA's progress on completion of well site survey reports relative to the total number of community supplies.

Results from the well site survey program to date, clearly demonstrate the need for minimum and maximum setback zone protection. A great number of wells with potential sources in close proximity have also shown organic chemical contamination.

Groundwater Hazard Reviews

In accordance with Section 17.1 of the Act a county or municipality having a population of less than 25,000 or 5,000 persons respectively, may also request the IEPA to perform a hazard review after receipt of a well site survey report. While the IGPA does not directly specify how to perform a hazard review, Section 17.1(h) of the Act does list the factors the IEPA is to consider.

"identify potential primary sources, potential secondary sources, and potential routes which present a hazard to the continued availability of groundwaters for public use, given the susceptibility of the groundwater recharge area to contamination."

Using this as a guide, the Agency developed a hazard review protocol consisting of the following five steps:

- a detailed survey of potential sources and routes of contamination out to a distance of 1500 feet from the well;
- delineation, to the extent practicable, of the recharge area outside of applicable setback zones;
- an audit of permit files, cleanup site information, registered underground storage tanks, toxic chemical release reports, and groundwater monitoring data within 3,000 feet of the community well field;
- a hazard ranking according to the minimal hazard criteria of Section 14.5 of the IGPA; and
- a correlation of all the information described above to determine what poses a potential hazard to the continued availability of the groundwaters for public use.

The IEPA has received three requests, and completed three hazard review reports for the communities of Marengo, Union, and Richmond. The IEPA

utilized the available hydrogeologic data to perform groundwater modeling and geologic interpretation of the recharge areas at these communities. Each of these reports related this delineated recharge area to the existing zoning, potential sources and routes, and the hazard rating for each of these sources and routes.

Each hazard review recommended that the communities consider the benefit of adopting maximum setback zones, establishing regulated recharge areas, and performing further study of the aquifer properties to confirm the groundwater modeling results contained in the reports. In addition, communities were advised to consider these factors and land use zoning when siting new community wells.

Groundwater Protection Needs Assessments

Section 17.1 of the Illinois Environmental Protection Act, as amended by Section 17.1 of the IGPA, provides the authority to every county or municipality served by a community water supply well to perform a groundwater protection needs assessment. The IGPA specifies that groundwater needs assessments shall include the following:

- "1. Evaluation of the adequacy of protection afforded to resource groundwater by the minimum setback zone and, if applicable, the maximum setback zone.
2. Delineation, to the extent practicable, of the recharge area outside of any applicable setback zones but contained within any area for which the county or municipality has jurisdiction or control.
3. Identification and location of potential primary and potential secondary sources and potential routes within, and if appropriate, in proximity to the delineated recharge area for each such well.
4. Evaluation of the hazard associated with identified potential primary and potential secondary sources and potential routes contained within the recharge area specified according to subparagraph (a)(2) of this Section, taking into account the characteristics of such potential sources and potential routes, the nature and efficiency of containment measures and devices in use, the attenuative qualities of

site soils in relation to the substances involved, the proximity of potential sources and potential routes and the nature, rate of flow, direction of flow and proximity of the uppermost geologic formation containing groundwater utilized by the well.

5. Evaluation of the extent to which existing local controls provide, either directly or indirectly, same measures of groundwater protection.
6. Identification of practicable contingency measures, including provision of alternative drinking water supplies, which could be implemented in the event of contamination of the water supply."

As previously discussed under the Resource Evaluation Section of this status report, the SWS and the SGS began work on a needs assessment for the City of Woodstock in December of 1990.

The IEPA has also provided grants to the Village of Cary in McHenry County, and the Pleasant Valley Public Water District in Peoria County for the purpose of performing pilot groundwater protection needs assessments. The IEPA is also conducting a pilot needs assessment for the City of Pekin. All of the pilot needs assessments are being performed in priority groundwater protection planning regions. It is hoped that these four pilot assessments will help market and encourage additional communities to perform these assessments.

REGIONAL GROUNDWATER PROTECTION PROGRAM

Section 17.2(a) of the IGPA requires the IEPA to establish a regional groundwater protection planning program. The IEPA, in cooperation with ENR, must designate priority groundwater protection planning regions. The IGPA requires that such designations shall take into account the location of recharge areas that are identified and mapped by ENR.

The Department completed the mapping of appropriate recharge areas in early 1989 and provided a prioritization map in the fall to assist the IEPA in designating priority groundwater protection planning regions.

Section 17.2(b) of the IGPA also requires the IEPA to establish a regional planning committee for each priority groundwater protection planning region. Each committee is to be appointed by the Director of the IEPA and shall include representatives from among the following

- counties and municipalities in the region;
- owners or operators of public water supplies which use groundwater in the region;
- at least three members of the general public which have an interest in groundwater protection; and
- the IEPA and other State agencies as appropriate.

From among the non-state agency members, a chairperson shall be selected by a majority vote. Members of a regional planning committee shall serve for a term of two years.

The IEPA utilized the priority recharge area map, groundwater pumpage data, population affected, water supply characteristics, solid waste planning efforts, and other factors to select two priority groundwater protection planning regions. The Director of the IEPA has designated the associated committees for these planning regions. Figure 14 illustrates these two regions, and the associated committee members.

FIGURE 13—REGIONAL GROUNDWATER PROTECTION

PLANNING COMMITTEES

NORTHERN PLANNING REGION

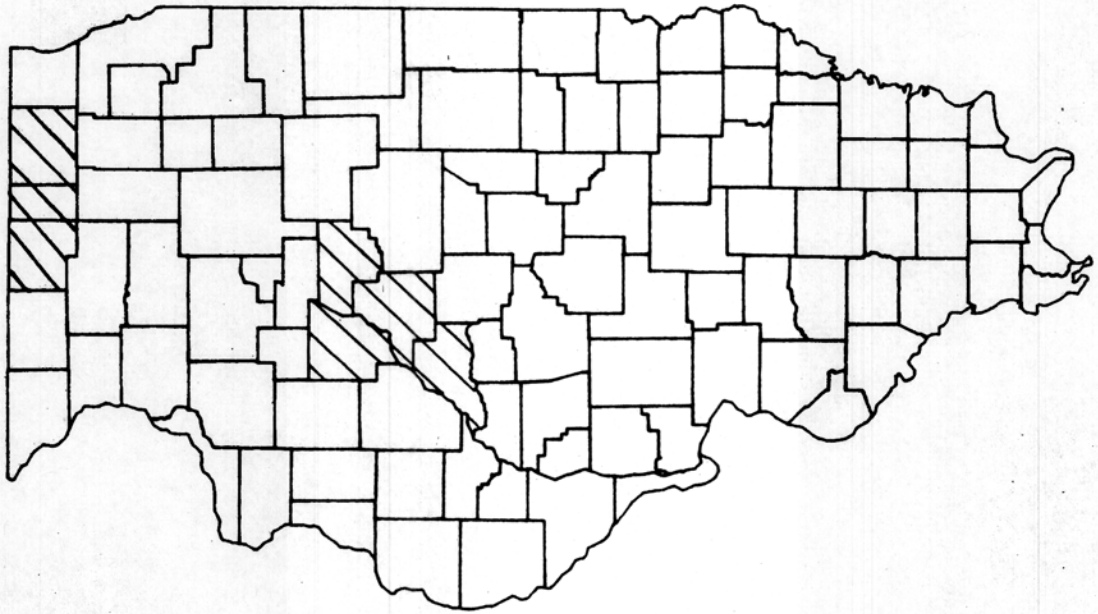
Counties—Winnebago, Boone, McHenry

- Robert Nimmo(Chrm.)—Rockford Public Water Supply
- Pat McNulty(V.Chrm.)—McHenry Co. Environmental Health
- Debbie Carlson(Sec.)—Boone Co. Environmental Health
- James Anderson—Winnebago Co. Environmental Health
- Fred Batt—McHenry Water and Sewer
- Dennis Anderson—City of Woodstock
- Ora Larson—Village Trustee, Rockton
- Robert Lansdorf—McHenry Co. Defenders
- Linda Baer—Woodward Governor Company
- Betty Johnson—League of Women Voters, Environmental Chrm.
- Jimmy Grimes—Public Water Supply Operator, Belvidere

Central Planning Region

Counties—Peoria, Woodford, Tazewell, Mason

- Bill Compton(Chrm.)—Caterpillar Company, Environmental Affairs
- Lisa Haderlein(V.Chrm.)—Peoria Co. Planning and Zoning Dept.
- Patricia Welch(Sec.)—Tazewell Co. Health Dept.
- Bob Weers—Administrator, Woodford Co. Zoning
- Edward Whitaker—Mason Co. Farm Bureau
- Jerry Appenzeller—Citizen
- Bill Ebert—Citizen and Well Driller
- David Woodson—Peoria Public Water Supply
- Mel Pleines—Public Water Supply Operator, Minier
- The Honorable R.W. Ramsey—Village of Creve Coeur,
Board President
- The Honorable William Clutts—Village of North Pekin,
Board President



Members of the Central Planning committee met in Peoria on April 16, 1991 in conjunction with a groundwater protection workshop sponsored by ENR. Members of the Northern Planning Committee met April 10, 1991 in Rockford at a similar workshop. The Northern Planning Committee has established three subcommittees: an education subcommittee; a public relations subcommittee; and a planning, zoning, and development subcommittee. The Central Planning Committee has also established an education subcommittee. The Agency has established an intergovernmental agreement with a County Health Department in each of the priority planning regions to help support the process.

Section 17.2(c) of the Illinois Environmental Protection Act, as amended in Section 17.2(c) of the IGPA, specifies that each regional planning committee shall be responsible for the following:

- "1. identification of and advocacy for region-specific groundwater protection matters;
2. monitoring and reporting the progress made within the region regarding implementation of protection for groundwaters;
3. maintaining a registry of instances where the IEPA has issued an advisory of groundwater contamination hazard within the region;
4. facilitating informational and educational activities relating to groundwater protection within the region; and
5. recommending to the IEPA whether there is a need for regional protection pursuant to rulemaking before the PCB. Prior to making any such recommendation, the regional planning committee must hold at least one public meeting at a location within the region. This meeting may be held after not less than 30 days notice is provided, and must provide an opportunity for public comment."

The IEPA is proposing to establish one or two additional priority groundwater protection planning regions in 1992.

Regulated Recharge Areas

The IEPA may propose a regulation to the Board establishing the boundary of a regulated recharge area⁽²⁾ pursuant to Section 17.3 of the IGPA if any of the following conditions exist:

1. the IEPA has previously issued one or more advisories within the area;
2. the IEPA determines that a completed groundwater protection needs assessment demonstrates a need for regional protection; or
3. mapping completed by DENR identifies a recharge area for which protection is warranted.

In addition, IEPA must propose to the Board a regulation establishing the boundary for a regulated recharge area if a regional planning committee files a petition requesting and justifying such action, unless the IEPA:

1. determines that an equivalent proposal is already pending before the Board and so notifies the petitioner within 60 days of the receipt of the petition; or
2. provides within 120 days a written explanation of why such action is not otherwise warranted.

At least sixty days prior to the filing of a proposal to establish the boundary for a regulated recharge area, the IEPA must notify in writing each affected county, municipality, township, soil and water conservation district and water district, and must publish a notice of such intended action in a newspaper of general circulation within the affected area. In proposing a boundary for a regulated recharge area, the IEPA must also identify each community water supply well for which protection up to 2,500 feet will be provided by operation of the regulations adopted by the Board relative to existing activities within the proposed regulated recharge area. To date there have been no regulated recharge areas proposed to the Board.

⁽²⁾ "Regulated Recharge Area" means a compact geographic area, as determined by the Board, the geology of which renders a potable resource groundwater particularly susceptible to contamination.

GROUNDWATER ENFORCEMENT

On November 21, 1989 the IEPA Office of Chemical Safety's Emergency Response Unit requested that IEPA Division of Public Water Supplies complete a hydrogeologic review at the Amoco-Mobil Bulk Oil terminal located in North Pekin in Tazewell County. The Division of Public Water Supplies became involved in the case because the contamination site is located approximately 850 feet from a well field which supplies water to the Village of North Pekin and Marquette Heights. In addition, the site is approximately 1,800 feet from the Village of Creve Coeur's community water supply.

The Amoco-Mobil site is located in Northern Pekin near the Illinois River and consists of a bulk petroleum storage/distribution center. Petroleum products are pumped from a terminal on the River to an above ground storage area. There are nine storage tanks on the Amoco property and five tanks on the Mobil site ranging in size from 67,000 barrels (2,814,000 gallons) to 20,000 barrels (840,000 gallons).

Both sites have a history of releases where product was spilled on to the soil. It is estimated that a total of 167,400 gallons of petroleum product consisting of gasoline, diesel fuel and heating oil were spilled on the Amoco site since 1983. There is a liquid phase hydrocarbon plume which underlies both the Amoco and Mobil property, and has migrated approximately 500 feet off site in a south-westerly direction. The southern edge of the liquid hydrocarbon underlies a residential area and is approximately 820 feet from the Northern Pekin Well 1.

The IEPA released an "advisory of groundwater contamination hazard" pursuant to Section 17.1(g) of the IGPA on July 20, 1990 due to the close proximity of the liquid hydrocarbon product to the North Pekin and Marquette Heights wells and the fact that low levels of dissolved gasoline constituents were detected in North Pekin Well 1 and Marquette Heights Wells 4 and 5. An

enforcement notice letter was then sent to Amoco Oil Company on July 23, 1990.

On January 16, 1991 an Interim Agreed Order between the Attorney General, the IEPA, and Amoco Oil Company was entered in Tazewell County Circuit Court. Accordingly, Amoco agreed to start a groundwater pump and treatment system, and to construct and operate the Mobil groundwater pump and treatment system by March 15, 1991.

There are also provisions in the Interim Order requiring Amoco to provide the owners and operators of potable water supply wells including the community wells of North Pekin, Marquette Heights, and Creve Coeur with alternate water supplies in the event that waters from any well become unfit for human consumption due to contamination by petroleum products.

The remediation method being used at the Amoco site is the pump and treatment of groundwater. Eight recovery wells were constructed at the Amoco facility, four recovery wells were constructed at the Mobil facility and three recovery wells were constructed south of the Mobil site in the direction of the North Pekin and Marquette Heights wells. The Agency performed predictive groundwater modeling to determine if the pump and treatment system would effectively capture and contain the contamination. The predictive modeling results of the groundwater flow system compare favorably with the observed water surface created by the pump and treatment remediation.

Up to this time, the recovery system appears to have stalled the movement of the liquid petroleum plume but has not been very successful in recovering product. The IEPA will continue to work with the responsible parties to optimize the recovery process.

ADVISORIES OF GROUNDWATER CONTAMINATION HAZARD

Pursuant to Section 17.1 (g) of the Act the IEPA is authorized to issue an advisory of groundwater contamination if warranted:

"The Agency may issue an advisory of groundwater contamination hazard to a county or municipality which has not prepared a groundwater needs assessment and for which the Agency has conducted a well site survey. Such advisory may only be issued where the Agency determines that existing potential primary sources, potential secondary sources or potential routes identified in the survey represent a significant hazard to the public health or the environment. The Agency shall publish notice of such advisory in a newspaper of general circulation within the county or municipality and shall furnish a copy of such advisory to any applicable regional planning committee."

On five occasions the IEPA has found that such a "significant hazard to the public health or the environment" warranted the issuance of groundwater contamination advisories. These advisories were issued to the following communities: North Pekin, Marquette Heights, Creve Coeur, South Chicago Heights, and Chandlerville.

North Pekin, Marquette Heights and Creve Coeur

A significant hazard advisory was issued to North Pekin and Marquette Heights on July 25, 1990 and at Creve Coeur on November 20, 1990. Each of these advisories relate to a common hazard associated with recent and historical spills of gasoline and oils at the Amoco Oil Company's bulk terminal and the Mobil Corporation's Peoria bulk storage and distribution terminal, both in Creve Coeur, as previously described in the Groundwater Enforcement Section of this report.

South Chicago Heights

On October 15, 1991 the IEPA issued a groundwater hazard advisory for the City of South Chicago Heights. The South Chicago Heights well site survey report indicated that a significant hazard to the public water supply existed from waste disposed at a local landfill or from nearby light/heavy commercial

activities which has contaminated the groundwater utilized by the South Chicago Heights community water supply. Groundwater sample results indicated the presence of trans-1,2-dichloroethylene and vinyl chloride in South Chicago Heights Well 3, with concentrations of vinyl chloride in excess of the Maximum Contaminant Levels (MCL) or drinking water standards established by the U.S. Environmental Protection Agency (USEPA). Furthermore, Well 4 indicates the presence of chlorobenzene, ethylbenzene, toluene, and xylene. The IEPA has advised South Chicago Heights to seek an alternate source of water.

Chandlerville - October 18, 1990

On October 18, 1990 the IEPA issued a groundwater contamination advisory for the City of Chandlerville. The Chandlerville well site survey report indicated that a significant hazard to the public water supply existed from an existing potential secondary source of groundwater contamination which appears to have contaminated the groundwater from which Chandlerville draws its water. This contamination appears to be a result of pesticide mixing and handling practices from an agricultural chemical dealership southeast of Chandlerville Well 2. Monitoring conducted by the Agency confirmed consistent levels of several pesticides including alachlor, atrazine, and metolachlor. At the time of the advisory, the alachlor and atrazine concentrations in the Chandlerville potable water exceeded USEPA's proposed MCLs. Chandlerville Well 2 is the the sole source of supply for the Village. The Village of Chandlerville has conducted an engineering study which will allow them to seek an alternate source of water. The cost of this alternative water source is approximately \$280,000. The State provided Chandlerville with a Department of Commerce and Community Affairs (DCCA) grant to assist with this water well replacement. The IEPA is continuing to evaluate completed well site surveys for preparing new hazard advisories where warranted.

DEPARTMENT OF PUBLIC HEALTH GROUNDWATER PROTECTION PROGRAM

The Illinois Department of Public Health responded to the IGPA by assuming responsibility for issuing all potable water well permits except community water supplies. The Water Well Construction Code was revised to respond to this need and rules were promulgated for fees for construction permits. The rules provide a minimum setback zone between potable water wells and potential sources or routes of contamination. DPH issued 8,701 well permits during the first year and will issue over 7,800 during 1991. As of January 1, 1992, a total of 60 local health departments have assumed permit delegation authority. In addition, health departments have been made responsible for the inspection and sampling of over 5,600 non-community public water supplies. Permits for new wells can be issued at the county level. Furthermore, DPH has assumed the permit responsibility for all water wells (e.g. irrigation etc.) in addition to potable water wells.

The Illinois Water Well Construction Code has recently been amended to include requirements for the construction of monitoring wells and closed-loop heat pump wells. In addition, monitoring well contractors will be required to submit monitoring well construction and sealing reports to the Illinois Department of Public Health or approved local health departments.

The Illinois Water Well Pump Installation Code was amended to require backflow prevention devices to be installed on agricultural irrigation wells utilizing chemical systems to directly apply pesticides and fertilizers via the water well pump.

The effective date for the above amendments is January 1, 1992.

Copies of the revised Illinois Water Well Construction Code and Illinois Water Well Pump Installation Code were mailed to licensed contractors by November 25, 1991.

MINIMUM HAZARD CERTIFICATION PROCESS

The IEPA is authorized by the IGPA to develop and administer a certification system for certain potential primary and secondary sources. Under this system, the owner of a site may, after January 1, 1988, provide a certification of minimal hazard to the IEPA in lieu of being restricted by the 400 foot minimum setback or affected by certain technology regulations being considered as (35 Ill. Adm. Code 615 and 616). However, minimum hazard certifications will only be granted to sites meeting specific criteria for a particular time period. The minimal hazard certification system is designed to protect community water wells while allowing small commercial operations and business to achieve compliance in a reasonable fashion. A preliminary procedure has been developed which will include a minimum hazard certification and guidelines for the use and management of containers and above ground tanks, and for the piling of waste. As indicated above, the IPCB is currently in the process of adopting technology regulations pursuant to the IGPA. These regulations and their requirements will help to finalize the guidelines and allow these to be made available for use.

The IGPA specifies time periods for certification and a decertification procedures. Once a site has been certified, the owner must recertify periodically according to the adopted time periods, and maintain compliance with conditions necessary for certification (Subsection d, Section 14.5). Failure to maintain compliance may result in decertification and subjection to regulatory performance standards. Any county or municipality may enter into a written delegation agreement with the IEPA to administer the provisions of the minimal hazard certification. The local governmental unit must adopt an ordinance if delegation is requested.

GROUNDWATER QUALITY PROTECTION - FUTURE DIRECTIONS

The future direction of the groundwater protection efforts will be according to the Implementation Plan. In some tasks, the priority may be shifted due to funding constraints. The overall progress of implementing the IGPA has been good. The first four years focused upon the minimum setback zones, initiating a maximum setback zone program, conducting well site surveys, resource mapping, regulatory development, initiating a pilot regional protection program and pesticide evaluation. The priorities for the next two years are as follows:

- Implement the groundwater quality standards and technology regulations;
- Continue to operate and expand the regional planning process;
- Continue to encourage community water supplies to establish maximum setback zones;
- Develop and implement a needs assessment process;
- Implement a long-term monitoring network; and
- Develop a State Pesticide Management Plan.

The projected direction for the action items of the Implementation Plan are as follows:

1) ICCG Operations

- Review and update Implementation Plan
- Review regulatory agenda
- Conduct quarterly meetings
- Report biennially
- Begin to prepare comprehensive status report for January 1, 1994
- Continue to provide liaison person to GAC
- Assist IEPA with the preparation of a Groundwater Profile Report and self-assessment according to the new USEPA Groundwater Strategy

- Oversee, review and provide input to the preparation of a State Pesticide Management Plan being prepared by the Pesticide Subcommittee
- 2) GAC Operations
- Conduct routine meetings
 - Review reports, plans and regulatory proposals as appropriate
 - Prepare for orderly transition of new appointees
- 3) Education Program for Groundwater Protection
- Develop and implement workplans
 - Prioritize standards involvement, community protection aspects and regional planning area needs
- 4) Groundwater Evaluation Program
- Assess and continue to implement a Pesticide Network
 - Implement the community water supply well network sampling plan
 - Distribute Recharge Area Maps
 - Conduct assessments
 - Coordinate monitoring
 - Automate database
 - Complete pilot groundwater protection needs assessments and prepare a workbook for communities to follow
 - Hold workshops on groundwater protection needs assessment
- 5) Groundwater Quality Standards
- Implement the adopted regulations
 - Establish a regulatory development program to update the regulation with new constituents and associated standards
 - Establish a preventive notice and response program for community water supply wells

- Integrate the adopted groundwater quality standards with the development of a State Pesticide Management Plan

6) Wellhead Protection Program

- Minimum Setback Protection
 - Maintain and update community setback directory
 - Continue to enforce setback provisions
- Maximum Setback Zone Procedures
 - Continue to process maximum zone determinations
 - Propose maximum zones where appropriate
 - Develop brochures and workbook to assist local authorities and consultants
 - Fully automate and continue to implement the Quarterly Wellhead Protection Status Report (QWPSR)
 - Establish a hydrogeologic data base in cooperation with SGS and SWS for the purpose of providing technical assistance to community water supplies.
- Well Site Surveys
 - Continue to conduct well site surveys
 - Continue to provide well site survey reports
- Community Needs Assessments
 - Continue to develop and refine prototype needs assessment process
 - Continue to refine and develop a pilot needs assessment process
- Community Hazard Reviews
 - Continue to respond to hazard review requests
- Groundwater Hazard Advisories
 - Continue to review well site survey and hazard review data to issue groundwater advisories

- Integrate preventive notice program with groundwater advisories
 - Delineation of Wellhead Protection Areas (WHPA)
 - Delineate the five-year time related capture zone for community wells utilizing unconfined aquifers
 - Voluntary Source Identification and Management Within WHPAs
 - Establish a program to encourage voluntary identification of potential sources and routes of contamination within WHPAs by local governments
 - Establish a program to encourage voluntary management of groundwater contamination sources within WHPAs by local governments.
- 7) Regional Planning Program
- Designate 1-2 new regional planning areas and associated committees
 - Continue to support regional planning process
 - Respond to committee recommendations
- 8) Non-community and Private Well Program
- Continue to implement Wellhead Protection Program
 - Continue to issue potable well permits
 - DPH begin to issue other water well permits
 - Implement monitoring well closed loop heat pumps and backflow prevention code
- 9) Technology Standards
- Implement adopted regulations and develop a compliance program
- 10) Minimum Hazard Certification
- Develop and implement final guidelines and program

11) Waivers and Exceptions

- Continue to respond to requests and petitions in a timely and appropriate manner

RC:mab/568M/sp/1-96

Appendix A

INORGANIC CONSTITUENT SUMMARY FOR 3882 COMMUNITY WATER SUPPLY WELLS

PARAMETER	NUMBER ABOVE ESTABLISHED CRITERIA															
	GU	PFP	MCL	GWSI	GWSII	# OF SAMPLE	# OF DETECTS	MEAN	MIN	MAX	95%	75%	MEDIAN	25%	5%	UNITS
Total Dissolved Solids	1000	500	--	1200	1200	3511	3511	579.27	67	3700	1180	658	480	388	303	Mg/L
Fluoride (F)	1.4	--	4.0	4.0	4.0	3401	3401	.56	.07	168	1.48	.60	.33	.18	.10	Mg/L
Chloride (Cl)	500	250	--	200	200	3546	2092	46.31	1.0	1740	206	42	15	4	1.00	Mg/L
Sulfate (SO4)	500	250	--	400	400	3546	2763	107.43	1.0	1515	389	130	53	14	<10	Mg/L
Phenol (Phe)	100	1.0	--	--	--	3238	85	5.22	.01	55	<5	<5	<5	<5	<5	Ug/L
Cyanide (CN)	.025	--	2	.2	.6	3546	38	.01	.00	5.0	.010	.010	.010	<.005	<.005	Mg/L
Arsenic (As)	1000	50	50	50	200	3546	1038	4.69	.001	303	24	2	<1.00	<1.00	<1.00	Mg/L
Lead (Pb)	100	50	50	7.5	100	3494	227	6.26	.50	260	7	<5	<5	<5	<5	Ug/L
Mercury (Hg)	.5	--	2	2.0	10	3527	269	.10	.01	100	1.00	<.050	<.050	.010	.010	Ug/L
Selenium (SeI)	1000	10	10	50	50	3537	161	1.17	.005	39	2	<1.00	<1.00	<1.00	<1.00	Ug/L
Barium (Ba)	5000	1000	1000	2000	2000	3549	3525	218.02	5.0	22940	516	170	79	39	14	Ug/L
Boron (B)	1000	--	--	2000	2000	3542	2589	307.84	2.33	5517	1027	420	176	50	50	Ug/L
Cadmium (Cd)	50	10	10	5	50	3544	45	3.12	2.0	41	3	3	3	3	3	Ug/L
Chromium (Cr)	1000	50	50	100	1000	3542	240	5.29	3.0	130	6	<5	<5	<5	<5	Ug/L
Copper (Cu)	20	--	5000	650	650	3543	465	14.19	2.02	2680	33	5	5	5	5	Ug/L
Iron (Fe)	1000	--	1000	5000	5000	3547	2974	1455.84	5.0	45040	5485	1814	640	140	50	Ug/L
Manganese (Mn)	1000	150	150	100	10000	3547	2009	90.67	4.0	2240	462	72	21	7	5	Ug/L
Nickel (Ni)	1000	--	--	100	2000	3544	155	6.60	3.0	195	14	5	5	5	5	Ug/L
Silver (Ag)	5.0	--	50	50	---	3540	100	3.43	1.0	31	<5	3	3	3	3	Ug/L
Zinc (Zn)	1000	--	5000	5000	10000	3540	272	83.35	2.0	16050	140	<50	<50	<50	20	Ug/L
Nitrite (NO2)	10	--	10	10	100	3538	1052	.87	.00	88.40	5.10	.16	.10	.10	.10	Mg/L
Nitrate (NO3)	10	--	10	10	10	3538	1052	.87	.00	88.40	5.10	.16	.10	.10	.10	Mg/L
NO2 & NO3																

Footnotes:

- * - Value is estimated by using a log-probability regression to predict the values below the detection limit.
- GU - General Use Criteria, 35 IL. Adm. Code, 302.208
- PFP - Public And Food Processing Criteria, 35 IL. Adm. Code 302.304
- MCL - Maximum Contaminant Level, 35 IL. Adm. Code, 611.300
- GWSI - Groundwater Standards for Class I, 620.410
- GWSII - Groundwater Standards for Class II, 620.420
- Mg/L - Milligrams Per Liter
- Ug/L - Micrograms Per Liter

Appendix B

General Statistical Summary of VOC/VOA's

PARAMETER	STORET NUMBER	GWSI	GWSII	NUMBER OF DETECTIONS (N)	NUMBER OF SAMPLES	NUMBER OF WELLS ANALYZED (N*)	MEAN	STANDARD DEVIATION (STDEV)	MINIMUM VALUE (MIN)	MAXIMUM VALUE (MAX)	CONFIDENCE INTERVALS			
											95%	75%	50%	
1,1-Dichloroethylene	34501	7	35	58	3601	2565	1.056	1.01	1.00	41.80	1.00	1.00	1.00	Ug/L
1,1-Dichloroethane	34496	---	---	108	3685	2632	1.112	1.95	1.00	96.70	1.00	1.00	1.00	Ug/L
Trans 1,2-Dichloroethylene	34546	100	500	100	3093	2179	1.364	4.393	1.00	160.0	1.00	1.00	1.00	Ug/L
1,2-Dichloroethane	32103	5	25	17	2145	1948	1.010	0.270	1.0	10.0	1.00	1.00	1.00	Ug/L
1,1,1-Trichloroethane	34506	200	1000	155	3684	2631	1.393	5.116	1.00	143.0	1.00	1.00	1.00	Ug/L
Bromodichloromethane	32102	---	---	90	3685	2631	1.092	1.056	1.00	26.0	1.00	1.00	1.00	Ug/L
Trichloroethylene	39180	5	25	222	3685	2631	2.566	26.78	1.00	990.0	2.00	1.00	1.00	Ug/L
Tetrachloroethylene	34475	5	25	146	3685	2630	2.006	16.01	1.00	565.00	1.00	1.00	1.00	Ug/L
Chlorobenzene	34301	---	---	20	3684	2630	1.031	0.700	1.00	27.0	1.00	1.00	1.00	Ug/L
Benzene	34030	5	25	9	2079	1886	1.014	0.626	1.00	29.0	1.00	1.00	1.00	Ug/L
Toluene	34010	1000	2500	5	2073	1880	1.001	0.2267	1.00	11.0	1.00	1.00	1.00	Ug/L
Ethylbenzene	34371	700	1000	1	2076	1883	.996	0.046	1.0	1.0	1.00	1.00	1.00	Ug/L
Xylene	81551	10000	10000	7	1551	863	1.084	2.414	1.0	81.0	1.00	1.00	1.00	Ug/L
Carbon Tetrachloride	32102	5	25	13	3681	2631	1.00	0.185	1.00	8.0	1.00	1.00	1.00	Ug/L
Dichrobenzene	34716	---	---	7	1534	848	1.003	0.051	1.0	2.0	1.00	1.00	1.00	Ug/L

Footnotes:

 GWSI - Groundwater Standards for Class I, 620.410
 GWSII - Groundwater Standards for Class II, 620.420

Appendix C

General Statistical Summary of SOC's

PARAMETER	STORET NUMBER	GWSI	GWSII	NUMBER OF DETECTIONS (N)	MEAN	STANDARD DEVIATION (STDEV)	MINIMUM VALUE (MIN)	MAXIMUM VALUE (MAX)	CONFIDENCE INTERVALS			UNITS
									95%	75%	50%	
Lindane	39340	0.2	1	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
Heptachlor	39410	0.4	2	0	0.010	.0557	0.010	0.010	0.010	0.010	0.010	Ug/L
Aldrin	39330	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
Heptachlor Epoxide	39420	0.2	1	0	0.010	.0580	0.010	0.010	0.010	0.010	0.010	Ug/L
Alpha-Chlordane	39348	---	---	0	0.010	.0826	0.010	0.010	0.010	0.010	0.010	Ug/L
Gamma-Chlordane	39810	---	---	0	0.010	.0608	0.010	0.010	0.010	0.010	0.010	Ug/L
Dieldrin	39380	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
Endrin	39390	2	10	0	0.010	.0555	0.010	0.010	0.010	0.010	0.050	Ug/L
Methoxychlor	39480	40	200	0	0.050	.0534	0.050	0.050	0.050	0.050	0.050	Ug/L
O,p'-DDE	39327	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
P,p'-DDE	39320	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
O,p'-DDD	39315	---	---	0	0.010	.0556	0.010	0.010	0.010	0.010	0.010	Ug/L
P,p'-DDD	39310	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
O,p'-DDT	39305	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
P,p'-DDT	39300	---	---	0	0.010	.0555	0.010	0.010	0.010	0.010	0.010	Ug/L
Total PCB's	39516	---	---	4	0.106	.0782	0.010	0.100	0.010	0.010	0.010	Ug/L
Toxaphene	39400	3	15	0	0.978	.1453	1.0	1.0	1.0	1.0	0.15	Ug/L
2,4-D	39730	70	350	0	0.0835	.0727	0.1	0.10	0.10	0.10	1.0	Ug/L
Silvex	39760	50	250	0	0.050	.060	0.050	0.050	0.050	0.050	0.10	Ug/L
Terbufos	82088	---	---	0	0.050	.0558	0.050	0.050	0.050	0.050	0.050	Ug/L
Fonofos	81294	---	---	0	0.050	.0558	0.050	0.050	0.050	0.050	0.050	Ug/L
Trifluralin	81284	---	---	0	0.010	.0854	0.010	0.010	0.010	0.010	0.050	Ug/L
Atrazine	39630	3	15	27	0.122	.4164	0.010	4.8	0.010	0.050	0.010	Ug/L
Alachlor	77825	2	10	20	0.250	1.544	0.020	18.0	0.050	0.020	0.050	Ug/L
Metolachlor	39356	---	---	15	0.306	1.264	0.100	12.0	0.057	0.020	0.020	Ug/L
Cyanazine	81757	---	---	9	0.092	.341	0.050	4.5	0.10	0.10	0.100	Ug/L
Total Violations				75					0.050	0.050	0.31	Ug/L

Footnotes:

- GWSI - Groundwater Standards for Class I, 620.410
- GWSII - Groundwater Standards for Class II, 620.420

RC:mab/0568M/sp

Appendix D

APPENDIX D SUMMARY OF SYNTHETIC ORGANIC COMPOUNDS DETECTED IN PUBLIC WATER SUPPLY WELLS

Facility Name	County	Well No.	Date Drilled	Well Depth(ft)	*Suscept. Rating	Minimum Setback (ft)	Aquifer Type	Distance to Potential Source (ft)
Union/York (PWD)	Clark Co.	#1	1965	115	B1	400	Sand & Gravel	1,750
		#2	1988	115	B1	400	Sand & Gravel	1,730
Kirkwood	Warren Co.	#4	1948	1,069	E	200	Deep Bedrock	1,350
Monmouth	Warren Co.	#7	1966	2,448	E	200	Deep Bedrock	600
Plainville	Adams Co.	#4	1977	220	A5	400	Shallow Bedrock	250
Arenzville	Cass Co.	#1	1947	60	AX	400	Sand & Gravel	200
		#2	1969	60	AX	400	Sand & Gravel	160
Chandlerville	Cass Co.	#2	1969	37	AX	400	Sand & Gravel	760
Forrest	Livingston Co.	#3	1926	105	B2	400	Sand & Gravel	2,100
Good Hope	McDonough Co.	#2	1964	78	C1	400	Sand & Gravel	465
Creve Coeur	Tazewell Co.	#3	1950	78	AX	400	Sand & Gravel	180, 1,100. & 1,250
Mackinaw	Tazewell Co.	#4	1969	42	AX	400	Sand & Gravel	675
South Pekin	Tazewell Co.	#4	1973	112	A2	400	Sand & Gravel	250
		#5	1979	117	A2	400	Sand & Gravel	400
Heyworth	McLean Co.	#2	1959	59	AX	400	Sand & Gravel	1,900
Pleasant Hill	Pike Co.	#4	1982	75	AX	400	Sand & Gravel	400, 800 & 810

*Key to Susceptability Rating:

- AX - Alluvium, a mixture of gravel, sand, silt, and clay along streams, variable in composition and thickness
- A2 - Thick, permeable sand and gravel within 20 ft. of land surface
- A5 - Permeable bedrock generally within 20 ft. of land surface: overlying materials variable but mostly till
- B1 - Sand and gravel less than 20 ft. thick over relatively impermeable till or bedrock
- B2 - Sand and gravel, within 20 ft. of surface, overlain and underlain by relatively impermeable till, other fine-grained material and/or bedrock
- C1 - Permeable bedrock within 20 to 50 ft. of surface, overlain by till or other fine-grained material
- E - Uniform, relatively impermeable silty or clayey till at least 50 ft. thick; no evidence of interbedded sand & gravel

APPENDIX E

APPENDIX E. ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION SUMMARY
IN RESPONSE TO CONTAMINATED COMMUNITY WATER SUPPLY WELLS
AND LISTING OF MAJOR PROBLEMS WITH COMMUNITY WATER SUPPLY WELLS

In the spring of 1987 the Illinois Environmental Protection Agency, Division of Public Water Supplies, referred to the Division of Land Pollution Control's Pre-remedial Program a total of fifty-seven contaminated public well sites. Table E.1 displays the status of remedial response actions.

The initial step in their investigation process involved the completion of a preliminary assessment. The preliminary assessment (PA) is an initial screening tool which utilizes existing documented information to determine if a site will receive further study. All public water supply assessments were completed by the spring of 1988.

The second step in the pre-remedial process involves the completion of a screening site inspection (SSI) report. During this phase, the investigative team tours the site, develops an inspection work plan, and may conduct a limited hydrologic investigation (for the purpose of determining natural groundwater movement patterns and delineate the public wells area of influence).

Information obtained during the hydro-investigation can also be used to identify and/or eliminate potential sources of contamination. Sometimes tentatively identified responsible parties can be identified during the screening site inspection. As of April 30, 1989, screening site inspections have been undertaken at sixteen contaminated well sites.

The third and final stage of the pre-remedial process is the listing inspection and site scoring. During this phase, additional information can be obtained about the site and potential responsible parties. A much more detailed hydrologic investigation can be undertaken, and tentative

investigative findings can be either confirmed or disapproved.

As more information is obtained and sources of contamination identified the public well site will be removed from CERCLIS and the responsible party added. This new site will then be scored and possibly entered on either the National Priorities List or the State Priorities List.

In addition, Table E.2 of Appendix E displays a summary of the major problems with community water supply wells tested to date, a summary of action taken, and preliminary well site survey information.

mab/568M/sp/

Table E.1 PREREMEDIAL PROGRAM INVESTIGATIONS OF PUBLIC WATER SUPPLY SITES

SITE	ASSESSMENT	INSPECTION	SCORING	PRP/ID
	COMPLETED	COMPLETED	UNDERWAY	
Mill Creek #1	X	X		X
Belvidere #2 & 3	X	X		
Arenzville #2	X	X		X
Chandlerville #2	X	X	X	X
Kemmerer Village #6	X	X		X
Sandwich #1 & 2	X	X		X
Carol Stream #1	X			
Downers Grove #6 & 8	X			
Naperville #8	X			
Momence #3	X			
Plano #4	X	X		
Edwardsville #8	X	X		X
Hartford #2, 3 & 4	X			X
Fox River Grove #2	X	X		X
Harvard #6	X			
Woodstock #1	X			
Petersburg #1 & 5	X	X		
Nokomis #6	X	X		X
Princeville #1	X	X		
Freeport Wells	X			
Ill. American #1 & 3	X	X		
Mackinaw #4	X	X		X
Albion #1	X	Dropped		
Morrison #1 & 3	X			
New Lenox #4	X	X		
GEM Suburban #3	X			
GEM Suburban #4	X			
Morristown MHP	X	X		
Barretts MHP	X			
Rockford #2				
Rockford #3				
Rockford #4				
Rockford #5				
Rockford #6				
Rockford #7a				
Rockford #8 & 8a				
Rockford #11				
Rockford #12				
Rockford #13				
Rockford #15				
Rockford #19				
Rockford #23				
Rockford #24				
Rockford #33				
Rockford #38				

Will be investigated within
the context of the NPL
Southeast Rockford study.

TABLE E.2

MAJOR CHEMICAL CONTAMINATION OF PWS PROBLEM SITES
 IDENTIFIED FROM ANALYSES CONDUCTED FROM 1985 TO 1991 AND WELL SITE SURVEYS
 PERFORMED FROM JANUARY 1, 1988 - PRESENT *Preliminary Assessment (CERCLIS).

<u>NAME OF IL COMMUNITY AND WELLS AFFECTED</u>	<u>RANGE OF CONTAMINANT CONCENTRATION PARTS PER BILLION (PPB)</u>	<u>RESPONSE/ACTION</u>
<u>CONFIRMED VOLATILE ORGANIC AND AROMATIC CONSTITUENTS (VOC/VOA) CONTAMINATION</u>		
1310050 Aledo Well #2 (31810) Mercer Co.	1.0-4.0	A) Initial study indicates presence of VOCs. B) Resample confirmed C) IEPA detailed well site survey indicates, Well #31810, (2) potential secondary sources of contamination, (3) potential problem sites within the minimum setback zone, (2) potential secondaries outside the minimum zone but within 1,000 ft of the well.
<u>SAFE DRINKING WATER ACT (SDWA) COMPLIANCE MONITORING VOC/VOA CONTAMINATION</u>		
0970050 Antioch Well #4 (20313) Lake Co.		A) Initial sample was taken on 7/86 as part of a state-wide monitoring network. No detections were found. B) Compliance monitoring indicates the presence of organic chemical contamination monitored quarterly.
SDWA Compliance Monitoring	3.6-6.7	
<u>CONFIRMED VOC/VOA CONTAMINATION</u>		
0894070 Aurora Well #8 (21127) Kane Co.	2.0-4.0	A) Initial sample indicated presence of 1 organic solvent, resample confirmed and detected 2nd organic solvent. B) 2 possible problem sites within 500' and 8 additional problem sites within 1000' of the wellhead.
SDWA Compliance Monitoring	1.0-1.70	

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION

2015235
*Barretts MHP
Well #1, (11123)
Well #2 (11124)
Winnebago Co.

1-19

A) Resampled and confirmed the presence of organic solvents.
B) IEPA detailed wellsite survey found: adjacent IEPA well #11123 16 possible problem sites within 1,000' of the wellhead at 300, 320, 460, 475, 540, 600, 740, 750, 760, 810, 820, 900, 950, 1000 feet. There are 16 possible problem sites within 1,000' of IEPA well #11124 at 150, 220, 275, 300, 400, 450, 590, 600, 620, 630, 710, 780, 825, 925, 950 feet.
C) Part of Winnebago County Groundwater Study conducted by IEPA.
D) IEPA issued contract study for comprehensive well site survey.

SDWA
Compliance
Monitoring

.50
4.70-5.10
2.50-3.40
14.0-17.0

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0435180
Belmont-Highwood
Well #1 (20157)
Well #2 (20518)
DuPage Co.

A) Initial samples were taken on 6/88 as part of a state-wide monitoring network. No VOC analysis on record.
B) Compliance Monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring

1.30-5.60.
1.00-5.10

CONFIRMED VOC/VOA CONTAMINATION SITE

0070050
Belvidere
Well #2 (11300)
Well #3 (11301)
Well #4 (11302)
Well #5 (11303)
Well #6 (11304)
Boone Co.

1-49

A) Resampled and confirmation was questionable in well #2. A second set of confirmation samples were taken.
B) IEPA detailed well site survey indicated the following within 1000 feet of each well:
#11300 There is (1) potential secondary source at 210 feet, and (20) possible problem sites at 550, 630, 670, 800, 975, 775, 700, 1000, 250, 500, 300, 60, 1000, 800, 425, 950, 700, 925, 130, 900, 280 feet from the well head. #11301 There are (19) possible problem sites at 200, 50, 600, 200, 375, 700, 350, 825, 400, 700, 800, 700, 650, 625, 600, 900, 480, 900 & 950 feet from the wellhead. #11302 There are (7) possible problem sites at 1000, 950, 700, 700, 750 &

SDWA
Compliance
Monitoring

.60-5.00
.67-3.00

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

750 feet from the wellhead.
#11303 There are no visible
potential sources, routes, or
possible problem sites.
#11304 There are 2 IEPA
hazardous waste generators at
375 & 850 feet, and (3)
possible problem sites at 500,
750 & 750 feet from the
wellhead.

CONFIRMED VOC/VOA CONTAMINATION

2015345
Bill Mar Hts MHP
Well #2, (11127)
Well #3(11128)
Winnebago Co.

1.0-3.0

A) Initial samples for wells
#2 and #3 indicate presence
of VOC's. 6/24/86.
B) IEPA detailed well site
survey indicates, Well #11127,
(2) potential problem sites
outside the minimum zone but
within 1,000 ft of the well,
Well #11128, (1) potential
secondary, (1) potential
problem site within the
minimum zone, (2) potential
secondaries, (6) potential
problem sites outside the
minimum zone but within 1,000
ft of the well and (1)
potential problem site 1,300
ft from the well.

SDWA
Compliance
Monitoring

3.00-6.00
.80-1.40

CONFIRMED VOC/VOA CONTAMINATION SITE

1410100
*Byron
Well #1(11776)
Well #2 (11777)
Ogle Co.

3.0-11.0

A) Initial sample indicated
presence of VOCs.
B) 2nd resample confirmed,
but 3rd resample did not
confirm.
C) IEPA detailed wellsite
survey found: #11776 There
are (2) potential secondary
sources 100 and 250 ft from
the wellhead and there are
(10) possible problem sites
within 1,000' of the wellhead
at 160, 200, 290, 470, 590,
745, 800, 810, 1000 ft
respectively. #11777 There
are (2) potential secondary
sources 100 and 250 ft from
the wellhead and there are
(10) possible problem sites
within 1,000' of wellhead at
150, 210, 280, 300, 460,
580, 735, 800, 1000 ft
respectively.

SDWA
Compliance
Monitoring
Water Treatment Plant

1.00-4.20

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

0075105
Capron MHP
Well #1(11001)
Well #2(11002)
Boone Co.

1-2

A) Initial sample indicated low concentrations of organic solvents. Initial followup did confirm. Resamples did not confirm (operator collected).
B) IEPA detailed well site survey indicates, Wells #11001 and #11002, no observed routes, sources or problem sites within minimum zones, (3) potential problem sites [one Haz Waste generator] outside minimum zone but within or adjacent to 1,000 ft of the wells.

SDWA
Compliance
Monitoring

1.50-1.90
1.0

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1970200
Channahon
Well #1 (20357)
Will Co.

A) Initial sample was taken on 10/87 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring

1.00-2.40

COMPLIANCE VOC/VOA CONTAMINATION

1470150
Cisco
Well #2 (47713)
Well #3 (47714)
Piatt Co.

A) Initial samples were taken on 6/86 for #47713 and #47714. No detections were found.
B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring
Water Treatment
Plant

.80

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0390050
Clinton
Well #3 (47637)
Well #6 (47638)
Well #9 (47641)
DeWitt Co.

A) Initial samples were taken on 2/87 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring
Water Treatment
Plant

3.00

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1970250 Crest Hill Well #1(20447) Well #6(20450) Will Co.	3.0-8.0	A) Initial sample indicates low levels of VOCs. Resample shows evidence of 1,1,1-TCA. B) Wellsite survey and resample in progress. C) Initial sample from Well #6 indicated the presence of 3.0 ppb of 1,1,1-TCA and t-1,2-DCE on 7/13/87.
SDWA Compliance Monitoring	.80 2.00-4.00	

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0415030 Douglas Water Co. Well #9 (45111) Douglas Co.		A) Initial sample was taken on 3/87 as part of a state-wide monitoring network. No detections were found. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring Water Treatment Plant	6.20	

CONFIRMED VOC/VOA CONTAMINATION SITE

0430300 *Downers Grove Well #6(20707) Well #8 (20709) Well #10 (20711) DuPage Co.	1-12	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed wellsite survey indicates within 1,000 ft of the wellheads; #20707 has one clean up site located 100 ft from the Wellhead, 20709 has fourteen possible problem sites located 30, 100, 170, 400, 350, 460, 500, 520, 740, 770, 780, 860, 940 and 940 ft from the Wellhead and 20711 has thirteen possible problem sites located 140, 160, 240, 280, 300, 340, 420, 460, 520, 600, 720, 740 from the Wellhead. C) Four distribution samples collected on 7/22/87 indicated average concentrations of 2.0 ppb of TCE and 4.0 ppb of PCE.
SDWA Compliance Monitoring Well #11 (20712)	.90-10.0 .70-1.60 .60-1.20	

CONFIRMED VOC/VOA CONTAMINATION SITE

1790200 East Peoria Well Allison #2 (24)(50359) Well #24(50359) Well #27(50364) Well #29(50366) Tazewell Co.	1.0-30	A) Well #24 - Initial sample indicates TCE. #27 initial sample indicates PCE. #29 initial sample indicates TCE levels high. B) IEPA detailed wellsite survey indicated the following
---	--------	---

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

SDWA
Compliance
Monitoring
Allison #1 (21)
(50358)

.65
2.00

within 1000 feet of each well: 50364 has 4 possible problem sites located 300, 300, 325, and 400 feet from the wellhead. 50366 has (4) possible problem sites located approximately 250, 600, 700, and 950 feet from the wellhead. 50359 has one possible problem site located within 950' of the wellhead. C) Distribution sample analysis indicates the presence of PCE.

CONFIRMED VOC/VOA CONTAMINATION SITE

1795345
Edgewood Trc MHP
Well #1(50078)
Well #2(50079)
Tazewell Co.

1.0-4.0

A) Initial sample 2/88 indicates the presence in Well #1 of two unknown compounds at 2 and 1 ppb respectively, and Well #2 of two unknown compounds at 2 and 4 ppb respectively. B) First quarterly samples 8/88, indicate Well #1 contains unknown compound. Well #2 did not confirm.

CONFIRMED VOC/VOA CONTAMINATION SITE

1190250
*Edwardsville
Well #8(60065)
Madison Co.

1-13

A) Resampled and confirmed the presence of organic solvents with a concentration of 1-13 ppb. B) The detailed wellsite survey by Southwestern Illinois Planning Commission indicated a possible problem site located 280' from wellhead. C) Part of regional study conducted by (IEPA) and Southwestern Illinois Metropolitan & Regional Planning Commission (SIMPC).

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0015425
El Rancho Vista Ests
Well #1 (52017)
Adams Co.

SDWA
Compliance
Monitoring
Water Treatment
Plant

1.10-1.60

A) Initial sample was taken on 3/87 as part of a state-wide monitoring network. No detections were found. B) Compliance monitoring of the single-well facility indicates the presence of VOCs, monitored quarterly.

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1435750
Fox Creek Farm
Well #1 (50184)
Peoria Co.

A) Initial samples was taken on 11/87 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring
Water Treatment
Plant

2.00-2.50

CONFIRMED VOC/VOA CONTAMINATION SITES

1110200
*Fox River Grove
Well #1 (20154)
Well #2 (20155)
McHenry Co.

1-16

A) Resampled and confirmed the presence of organic solvents.

37

B) IEPA detailed wellsite indicated the following within 1000 feet of each well: (20154) There are two possible problem sites at 550 and 800 feet from the wellhead. (20155) There are 7 possible problem sites at 380, 860, 730, 920, 960, 1000 & 1000 feet from the wellhead.

SDWA
Compliance
Monitoring
Water Treatment
Plant

17.0-21.0

1.3

.5-.7

CONFIRMED VOC/VOA CONTAMINATION SITE

1770200
*Freeport
Well #2 (11858)
#3(11859)
#4 (11860)
#5 (11861)
#6 (11862)
#7 (11863)
DIST.
Stephenson Co.

1-61

A) Resampled and confirmed the presence of organic solvents and gasoline related compounds with a concentration of 1-50 ppb.
B) Distribution system sampled and confirmed the presence of VOC/VOA's.
C) IEPA detailed wellsite survey indicated the following within 1000 feet of each well:

#11858 - There are (7) possible problem sites at 600, 720, 200, 800, 980, 870 & 750 feet away from the wellhead.

#11859 - There are (9) possible problem sites within 1,000 feet of

the wellhead area, at 200, 120, 400, 550, 900, 550, 600, 700 & 900 feet away from the wellhead. #11860 - There are (7) possible problem sites within 1,000 feet of the wellhead area at 100, 270, 700, 800, 900, 900 & 750 feet away from the wellhead.

#11861 - There are (2) possible problem sites within 1,000 feet of the wellhead area at 500 & 1000 feet away from the wellhead. #11862 -

SDWA
Compliance
Monitoring
Water Treatment
Plant

.54-1.00

.60-2.13

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

There are (2) possible problem sites within 1,000 feet of the wellhead area at 500 & 1,000 feet away from the wellhead.
#11863 - There are (4) possible problem sites within 1000 feet of the wellhead area, at 950, 500, 950 & 1,000 feet away from the wellhead.

CONFIRMED VOC/VOA CONTAMINATION SITE

2015495 *Gem Suburban MHP Well #1 (11135) Well #2 (11136) Well #3 (11137)(B) Well #4 (11138)(B) Well #5 (00121) Winnebago Co.	16-44	A) Resampled and confirmed the presence of organic solvents. B) Sampled distribution system. C) IEPA detailed well site survey indicates Wells #11135, #11136, #11137, #11138 and #00121 (1) potential secondary source located 350, 1100, 1650, 1500 and 1500 ft, respectively, from the wells. D) Part of Winnebago County Groundwater Study conducted by IEPA.
---	-------	--

CONFIRMED VOC/VOA CONTAMINATION SITE

2015439 *Goldie Floberg Children's Hm. Well #1, (11139) Well #2 (11140) Winnebago Co.	1-6.0 .20 .4-1.0	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed wellsite survey indicated one possible problem site located 230 and 270 feet from wells 11139 and 11140 respectively. C) Part of Winnebago County Groundwater Study conducted by IEPA.
SDWA Compliance Monitoring	1.60-2.30	

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0695000 Hardin Cnty PWD DuPage Co.		A) Samples were taken on 4/82, 7/82, and 12/90 as part of a state-wide monitoring network. No VOC analysis on record. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring Water Treatment Plant	1.10-12.0	

**NAME OF IL
COMMUNITY AND
WELLS AFFECTED**

**RANGE OF CONTAMINANT
CONCENTRATION
(PPB)**

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1190500		
*Hartford	1.0-27	A) Resampled and confirmed the presence of organic solvents, and gasoline related compounds.
Well #2(60104)		B) Sampled distribution system.
Well #3(60105)	2.0-4.0	C) IEPA detailed wellsite survey indicates the following within 1000 feet of each well: 60104 has 3 possible problem sites located at 300', 500', and 1000' ft from wellhead; 60105 has 3 possible problem sites located at 450', 500' and 1000 ft from wellhead. 60106 has 3 possible problem sites located at 500', 600' and 1000 ft. from wellhead.
Well #4(60106)		D) Regional study between Southwestern Illinois Metropolitan and Regional Planning Commission and Agency.
Madison Co.		E) Historical petroleum related problems, for example; exploding home basements.
SDWA		
Compliance	.90	
Monitoring		
Water Treatment	.50-1.70	
Plant		

CONFIRMED VOC/VOA CONTAMINATION SITE

1110250		
*Harvard	10-53	A) Resampled and confirmed the presence of organic solvents.
Well #3(20199)	1.0	B) Wells taken out of service by the City.
Well #4 (20200)	.6	C) IEPA detailed well site survey indicates, Wells #20199, #20200 and #20201 (2) potential problem sites within the minimum zone, (1) potential secondary, (3) potential problem sites outside the minimum but within 1,000 ft of the wells, (2) potential secondaries, (6) potential problem sites 1040-1740 ft from the wells, Well #20202, (1) potential problem site within the minimum zone, no other units observed.
Well #5 (20201)	Trace	D) Distribution sample taken.
Well #6 (20202)	.6	
McHenry Co.		

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1110300 Hebron Well #3(20186) Well #4(20187) McHenry Co.	1.0-3.4 1-143	A) Initial samples indicated presence of organic solvents. B) Resamples confirm presence of TCE for both wells. C) IEPA detailed well site survey indicates, Well #20186, (1) potential secondary sources of contaminant and (5) potential problem sites within minimum zone and (2) potential secondary sources and (9) potential problem sites outside the minimum zone but within 1,000 ft; Well #20187 (3) potential secondary sources and (8) potential problem sites within the minimum zone and (6) potential problem sites outside the minimum zone but within 1,000 ft of the well.
SDWA Compliance Monitoring	1.00 .60 1.20-1.70 4.70-55.6	

CONFIRMED VOC/VOA CONTAMINATION SITE

1230050 Henry Well #3(31301) Marshall Co.	2.0 145 18 36	A) Initial sample indicates presences of VOC's. B) IEPA detailed well site survey indicates, Well #31301, (1) potential secondary, (7) potential problem sites [5 may be potential secondary], within the minimum zone, (1) potential secondary, (5) potential problem sites outside the minimum zone but within 1,000 ft of the well.
SDWA Compliance Monitoring	.50	

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1795495 Hiatts Hideaway Tazewell Co.		A) No initial samples of well #50071 and well #50072 were taken. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring Well #3 (50071) Well #4 (50072)	.60-1.80	

<u>NAME OF IL COMMUNITY AND WELLS AFFECTED</u>	<u>RANGE OF CONTAMINANT CONCENTRATION (PPB)</u>	<u>RESPONSE/ACTION</u>
<u>SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION</u>		
1410250 Hillcrest Well #1 (11788) Ogle Co.	1.00	A) Initial sample was taken on 8/86 for well #11788 as part of a state-wide monitoring network. VOCs were present.
SDWA Compliance Monitoring	2.50-5.40	B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

CONFIRMED VOC/VOA CONTAMINATION SITE

1435030 IL-AM Wtr. Co. Peoria Dodge St. Well #4(52156) Well #3 (52155) Well #1 (52153) Peoria Co.	1.0-5.0	A) Initial sample shows presences of VOC's, resample confirms (t,1,2,DCE).
	2.0	B) IEPA detailed well site survey indicates all three Dodge Street wells have (1) potential secondary and (4) potential problem sites within the minimum setback zone, (13) potential problem sites outside the minimum but within 1,000 feet and (8) potential problem sites outside 1,000 feet but within the survey area.

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0430500 Itasca Well #8 (20758) Well #5 (20757) DuPage Co.		A) Initial sample was taken on 3/85 for #20757 and on 11/85 for #20758 as part of a state-wide monitoring network. No detections were found.
SDWA Compliance Monitoring	1.20-3.60 1.10	B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1970450 Joliet Well #10D (22121) Well #5D (22116) Will Co.		A) Initial sample was taken on 7/87 for well #22121 as part of a state-wide monitoring network. No detections were found. Initial sample was taken on 10/83 for well #322116 as part of a state-wide monitoring network. No VOC analysis on record.
SDWA Compliance Monitoring	.70-2.20 2.30-4.90	B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

0215189
*Kemmerer Vlg.
Christian
Children's Hm.
Well #6(00148)
Christian Co.

1.0-36

A) Resampled and confirmed the presence of organic solvents with a concentration of 10-36 ppb.
B) IEPA detailed wellsite survey indicates that within 1000 feet of the well; 1 potential route is located 100 ft. from well and 3 other possible problem sites are located at 250 ft, 430 ft, and 840 ft from wellhead.

SDWA
Compliance
Monitoring
Water Treatment
Building

3.90-13.0

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0430600
Lombard
Well #4 (20787)
Well #5 (20788)
Well #6 (20789)
Well #7 (20790)
Well #8 (20791)
Well #9 (20792)
Well #10 (20793)
Well #11 (20794)
DuPage Co.

A) Initial samples were taken on 12/87 for wells #20787, #20788, #20789, #20790, #20791, #20792, #20793, and #20794 as part of a state-widemonitoring network. No detections were found.

B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring

.61

CONFIRMED VOC/VOA CONTAMINATION SITE

2010150
*Loves Park
Well #1 (11613)
Well #2 (11614)
Winnebago Co.

1.0-49.0

A) Resampled and confirmed the presence of organic solvents.

1.0-6.0

B) IEPA follow-up, engineering visit and preliminary investigation indicates 7 possible problem sites within 300' from the wells.

1.0

1.0-5.1

1.0

2.1

1.0

C) Part of Winnebago County Groundwater Study conducted by the IEPA. VOC/VOA

SDWA
Compliance
Monitoring

1.50-11.0

.34-.90

1.60-4.40

.60-9.60

.90-11.0

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1790400 Marquette Hts. Well #3	Trace Trace	A) Amoco study indicates floating hydrocarbons on water table. Mobil study indicates dissolved BTX, MTBE and PAH migrating towards Marquette Hts. Wells 4 and 5, PWS well #1 indicates MTBE. B) Marquette Heights PWS was sampled by IEPA on 7/9/90 due to recent and historical spills from the Amoco/Mobil fuel terminal. Initial analyses indicated trace levels of T and X and low levels of MTBE. C) IEPA detailed well site survey indicates, Wells #50280 and #50281, (1) potential problem site within the minimum zone, (2) potential secondaries, (2) potential routes outside the minimum zone but within 1,000 ft of the wells and (6) potential problem sites outside 1,000 ft from the well.
Well #4 (50280)	1.2-1.8	
Well #5 (50281)	1.0	
Tazewell Co.		

CONFIRMED VOC/VOA CONTAMINATION SITE

1610400 Milan Well #3(31860) Rock Island Co.	1.0 11.0	A) Preliminary analysis indicates presence of organic solvents. B) Quarterly sample 4/88 confirms PCE 2 ppb.
---	-------------	---

CONFIRMED VOC/VOA CONTAMINATION SITE

0015300 *Mill Creek Well #1 (52013) Well #2(52014) Adams Co.	1.0-5.0 1.0	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed well site survey indicates, Wells #52013 and #52014, (2) potential problem sites within the minimum zone, (2) potential problem sites outside the minimum zone but within 1,000 ft of the wells, (5) potential problem sites 1,700-2,300 ft from the wells. C) Sampled distribution system.
--	----------------	---

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

0910650 *Momence Dist. Syst., Well #1 (22087) Well #2 (22088) Well #3 (22089) Well #4 (22090) Well #6 (00211) Kankakee Co.	1.0-202.0	A) Resampled and confirmed the presence of organic solvents and gasoline related compounds. B) Confirmed nearby gas leak. C) IEPA detailed well site survey indicates wells #22087 and #22088 have (3) potential problem sites within the minimum zone and (1) potential secondary and (3) potential problem sites outside the minimum zone but inside 1,000 ft; Well #22087 has (3) potential problem sites within the minimum zone and (1) potential secondary and (2) potential problem sites outside the minimum zone but within 1,000 ft; Well #22090 has (1) potential problem site within the minimum zone and (4) potential problem sites outside the minimum zone, but within 1,000 ft.
SDWA Compliance Monitoring Well #5 (00116)	.60-7.40 .76-2.30	

CONFIRMED VOC/VOA CONTAMINATION SITE

0894690 Montgomery Well #2(20067) Kane Co.	1.0-5.0 .8 .5	A) Initial sample indicated organic solvents. Confirmed by resample. B) IEPA detailed well site survey indicates, Well #20067, (2) potential problem sites within the minimum zone, (3) potential secondaries, (7) potential problem sites outside the minimum zone but within 1,000 ft and (3) potential problem sites 1340-1460 ft from the well.
---	---------------------	--

CONFIRMED VOC/VOA CONTAMINATION SITE

1950350 *Morrison Well #1, 3(11907)(B) Well #2(11908)(B) Well #3 (11909) Well #4 (11910) DIST. Whiteside Co.	4-952 2.0 6.0	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed well site survey indicates, Well #11909, no observed potential routes, sources or problem sites within the minimum zone, (1) potential secondary, (1) potential problem site outside the minimum zone but within 1,000 ft, (5) potential problem sites from 1,100-3,000 ft of the well; Well #11910, no observed potential routes, sources or potential problem sites within 1,000 ft, (1) potential problem site 1300 ft from the well.
---	---------------------	---

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

2015545
Mancuso Village
Park MHP
Well #1 (11687)
Well #2 (11688)
Winnebago Co.
(Formerly Morris-
town MHP)

3-21.4

A) Resampled and confirmed the presence of organic solvents.
B) IEPA detailed well site survey indicates, Wells #11687 and #11688, no observed potential routes, sources or problem sites within or adjacent to 1,000 ft of the wells.
C) Part of Winnebago County Groundwater Study

SDWA
Compliance
Monitoring

.50-.60
2.20-4.90

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0435800
Maple Park IMP ASSN
DuPage Co.

A) Samples were taken on 3/82 and 4/91 as part of a state-wide monitoring network. No VOC analysis on record.
B) Compliance monitoring indicates the presence of VOC/VOA, monitored quarterly.

SDWA
Compliance
Monitoring
Wells 1 & 2
(20472 & 20473)

1.60-2.40
1.40-2.00

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1110650
Marengo
Well #6 (20193)
McHenry Co.

.70

A) Initial sample was taken on 11/86 for well #20193 as part of a state-wide monitoring network. No detections were found.
B) IEPA detailed well site survey indicates that well #20193 has (1) potential problem site within the minimum set zone that is a non-hazardous waste generator and (1) potential problem site outside the minimum zone, but within 1,000 ft of the well.
C) Well # 20193 was sampled on 2/90 as part of a hazard review. Benzene was detected.
D) Compliance monitoring indicated the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring

.51-4.20
.70

CONFIRMED VOC/VOA CONTAMINATION SITE

1970700
*New Lenox
Well #4(20410)
Will Co.

4-105

A) Resampled and confirmed the presence of organic solvents.
B) Well taken out of routine service.
C) Village hired consultant to evaluate the problem.

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

SDWA
Compliance
Monitoring

.80
.80-5.00
1.00
2.00-3.00

D) IEPA detailed well site survey indicates, Well #20410, (2) potential secondary sources, (1) potential problem site within the minimum setback zone, (1) potential secondary, (8) potential problem sites outside the minimum zone but within 1,000 ft of the well.

CONFIRMED VOC/VOA CONTAMINATION SITE

1350450
*Nokomis
Well #6(52110)
DIST.
Montgomery Co.

1.9-21
4.0
2.0

A) Resampled and confirmed the presence of organic solvents with a concentration of 5-15 ppb.

B) Sampled distribution system.

C) IEPA detailed wellsite survey indicates that well 52110 has 2 potential primary sources located 200' and 250', 2 potential secondary sources located at 290' and 440', and one possible problem site located 340' from the wellhead.

SDWA
Compliance
Monitoring
Water Treatment Plant

.70-1.80

CONFIRMED VOC/VOA CONTAMINATION SITE

1790550
North Pekin
Well #1 (50210)
Well #2 (50211)
Tazewell Co.

.9-1.1

A) N. Pekin wells #1 and 2 were sampled on 7/9/90 do to historic and recent spills from the Amoco/Mobil fuel terminal low levels of MTBE were indicated.

B) Nearby wells, see Marquette Hts., indicated hydrocarbons and an advancing plume.

C) A groundwater advisory was issued by the Agency for the community of N. Pekin on 7/26/90.

D) IEPA detailed well site survey indicates, Well #50210, (1) potential problem site within the minimum zone, (1) potential secondary, (2) potential problem sites outside the minimum zone but within 1,000 ft and (10) potential problem sites outside 1,000 ft from the well; Well #50211, (1) potential problem site within the minimum zone, (1) potential problem site outside

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

the minimum zone but within
1,000 ft and (2) potential
problem sites outside 1,000 ft
of the well.
E) Wells sampled for VOC/VOA
on 7/90.

CONFIRMED VOC/VOA CONTAMINATION SITE

1795040 *Pekin Il. American Wtr. Co Well #1 (50056) Well #3 (50058) Tazewell Co.	>1.0-24 4-5	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed wellsite survey indicates within 1,000 ft of the wellheads; #50056 has one potential route 50 ft and five possible problem sites located 800, 1000, 650, 850, 175 ft from the Wellhead and #50058 has one potential route 100 ft and six possible problem sites 700, 875, 1,000, 775, 1,000, 50 ft from the Wellhead, additionally there are several areas of concern which lie outside the 1000 ft survey area of both wells.
---	--------------------	---

CONFIRMED VOC/VOA CONTAMINATION SITE

1290200 *Petersburg Well #1 (50154) Well #4 (50156) Well #6 (50157) DIST. Menard Co.	1.0-2820 . 058	A) Resampled and confirmed the presence of organic solvents. B) Well 4 taken out of routine service by the city. C) IEPA detailed wellsite survey indicates the following within 1,000 feet of each wellhead: Well #50154 has 4 possible problem sites located at 170ft., 730 ft., 900 ft. and 900 ft from wellhead. Well #50156 has 4 possible problem sites located at 300 ft. 580 ft, 900 ft, and 1,000 ft from wellhead. Well #50157 has one potential route located 280 ft. from wellhead. D) Sampled distribution system.
--	--	--

CONFIRMED VOC/VOA CONTAMINATION SITE

0930200 *Plano Well #4(20128) Kendall Co.	1.0-13	A) Resampled and confirmed the presence of organic solvents. B) IEPA detailed wellsite survey indicated that well #20128 has one potential primary source at 400 feet, and two possible problem sites at 700 & 800 feet from the wellhead.
SDWA Compliance Well #5 (20129)	.50-8.20	

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0050200
Pocahontas
Well #6 (60146)
Well #7 (60147)
Bond Co.

A) Initial samples were taken on 10/86 for well #60146 and #60147 as part of a state-wide monitoring network. No detections were found.

B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring
Water Treatment
Plant

7.60

CONFIRMED VOC/VOA CONTAMINATION SITE

1430750
*Princeville
Well #1 (50136)
Peoria Co.

3-15

A) Resampled, and confirmed initial analyses.

B) IEPA detailed wellsite survey indicated the following within 1,000 ft of the wellhead: eight possible problem sites located 300, 630, 740, 200, 550, 250, 400 and 700 feet from the wellhead.

CONFIRMED VOC/VOA CONTAMINATION SITE

2010300
Rockford
G. Well #2 (11622)
G. Well #5 (11624)
G. Well #6 (11625)
Well #4 (11627)
Well #6 (11630)
Well #7A (11632)
Well #8 (11633)
Well #8A (11634)
Well #11 (11638)
Well #12 (11639)
Well #15 (11642)
Well #19 (11647)
Well #20 (11648)
Well #23 (11651)
Well #24 (11652)
Well #28 (11656)
Well #33 (11661)
Well #35 (11662)
Well #38 (11664)
Winnebago Co.

Trace-840.

A) Preliminary analysis indicates the widespread occurrence of VOC's.

B) Resampled and confirmed persistent trends in VOC levels. Presently, the Rockford School of Medicine is conducting quarterly samples.

C) Agency hired contractors (Manhiem) to evaluate the problem areas. In general, wells that have shown confirmed levels of VOC contamination also had numerous possible problem sites and/or sources near them, and wells that have not shown VOC contamination did not have apparent hazards near them.

.022

SDWA
Compliance
Monitoring

.51-4.30
1.0-2.10
.60-17.0
1.30-3.10
1.30-3.90
1.20-2.10

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

0374850
Sandwich
Well #1 (11430)
Well #2 (11431)
DeKalb Co.

5-113.0

A) Resampled and confirmed the presence of organic solvents.
B) Wells taken out of routine service.
C) IEPA detailed well site survey indicates, Wells #114301, and #11431 (1) potential secondary, (1) potential problem site within the minimum zones and (2) potential secondaries, (4) potential problem sites outside the minimum zones but within 1,000 ft; both wells have (1) potential secondary and (1) potential problem site 1,050-1,100 ft from the wells.
D) Sampled distribution system.

SDWA
Compliance
Monitoring
Water Treatment
Plant

3.40-9.30

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0190850
Sidney
Well #2 (47664)
Well #3 (47665)
Well #4 (47666)
Champaign Co.

A) Initial samples were taken on 5/86 for Well #47644, #47665, and #47666 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.

SDWA
Compliance
Monitoring
Water Treatment
Plant

6.90

CONFIRMED VOC/VOA CONTAMINATION SITE

2015685
*Six Oaks
Mobile Home Pk.
Well #1(11151)
Winnebago Co.

2-200

A) Resampled and confirmed the presence of organic solvents.
B) Distribution system sampled
C) Carbon filtration installed.
D) Land Pollution Control investigation and superfund immediate removal underway.
E) IEPA detailed well site survey indicates, Well #11151, (1) clean-up within minimum setback zone [5 waste oil and sludge tanks and 1 gasoline tank] and (1) potential problem site 1,500 ft from the well.

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0890800
South Elgin
Well #3 (20096)
Kane Co.

A) Initial sample was taken on 10/85 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring on 1/89 indicates the presence of VOCs, monitored quarterly.
C) Well #3 was sampled as part of a biotoxics subnetwork on 3/91. No VOC detections were found.

SDWA
Compliance
Monitoring

1.70

CONFIRMED VOC/VOA CONTAMINATION SITE

0312940
*S. Chicago Heights
Well #2 (20576)
Well #3 (20577)
Well #4 (00249)
DIST.
Cook Co.

2-4
1
97
5.0
7.0
9.0

A) Resampled and confirmed the presence of organic solvents.
B) IEPA detailed well site survey indicates, Well 20576, (1) potential secondary, (1) potential problem site within the minimum zone and (1) potential primary, (1) clean-up site [potential primary], (1) potential secondary, (2) potential problem sites, (1) inactive community well (possible route); Well #20577, (2) potential problem sites inside the minimum zone and (1) potential primary, (2) potential secondaries, (19) potential problem sites [one of which is Hac waste generator], outside the minimum but within 1,000 ft of the well, (1) cleanup 1340 ft from well; Well #00249, (1) potential secondary within the minimum zone, (3) potential secondaries, (3) potential problem sites outside the minimum zone but within 1,000 ft of the well.

SDWA
Compliance
Monitoring

.80-2.30

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0111000
Spring Valley
Well #10 (11379)
Well #11 (11380)
Bureau Co.

A) Initial samples were taken on 3/87 for well #11379 and #11380 as part of a state-wide monitoring network. No detections were found.
B) Compliance monitoring indicates the presence of VOCs. Monitored quarterly.

SDWA
Compliance
Monitoring

1.00

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1110900 Union Well #3 (20174) McHenry Co.	4.0	A) Initial sample indicates 1,2 DCA B) Latest resample does indicate presence of VOC. C) IEPA detailed well site survey indicates, Well #20174, there are no observed routes, sources or problem sites within 1,000 ft. However, there are two cleanups, apparently upgradient of this well. See (E) and the Village of Union Hazard Review for more details. D) The Agency has developed a hazard review for the Village of Union, as a result a maximum zone proposal, or a groundwater advisory may be issued for the Village.
--	-----	--

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

1835245 Valley Run Well #1 (45226) Well #2 (45227) Vermilion Co.		A) Initial sample was taken on 11/90 as part of a state- wide monitoring network. No VOC analysis on record. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring	3.50-5.50	

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0971750 Vernon Hills Well #3 (00325) Lake Co.		A) Initial sample was taken on 3/90 as part of a state- wide monitoring network. No VOC analysis on record. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring	2.60	

SDWA COMPLIANCE MONITORING VOC/VOA CONTAMINATION

0977350 Wildwood Well #7 (00261) Lake Co.		A) Initial sample was taken on 2/87 as part of a state- wide monitoring network. No results are available. B) Compliance monitoring indicates the presence of VOCs, monitored quarterly.
SDWA Compliance Monitoring	.76 .56	

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

CONFIRMED VOC/VOA CONTAMINATION SITE

1110950
*Woodstock
Well #1(22149)
McHenry Co.

2.0-8.0

- A) Resampled and confirmed the presence of organic solvents with a concentration of 8 ppb.
- B) Problem may be related to cleanup site 200' from the well.
- C) Preliminary survey indicates 22 possible problem sites located in close proximity to wellhead.
- D) ISWS, ISGS in conjunction with the Agency have begun preliminary work in performing a needs assessment for the community (4 cross-sections and water level readings are complete).

LD:SB:jmm/sp/741M/1-22

NAME OF IL
COMMUNITY AND
WELLS AFFECTED

RANGE OF CONTAMINANT
CONCENTRATION
(PPB)

RESPONSE/ACTION

