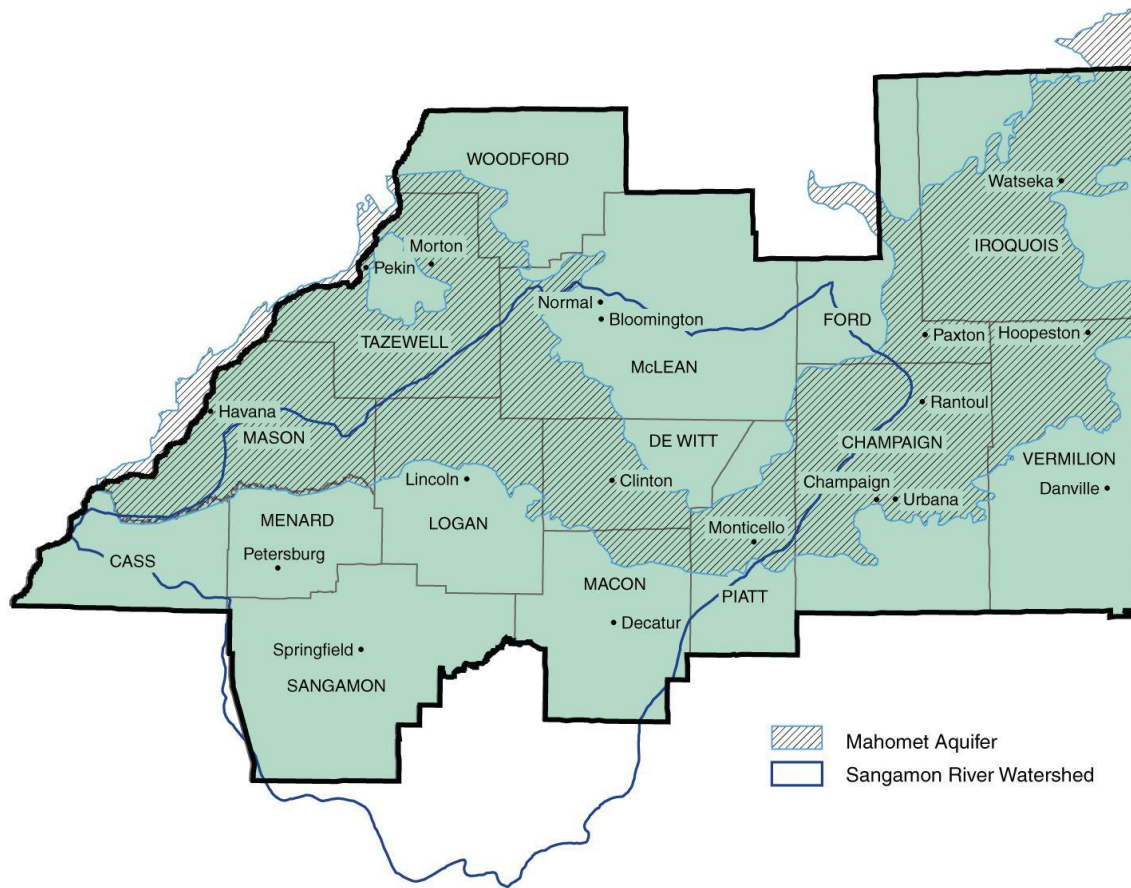


MAHOMET AQUIFER PROTECTION TASK FORCE: FINDINGS AND RECOMMENDATIONS

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SOURCE: MAHOMET AQUIFER CONSORTIUM, <http://www.mahometaquiferconsortium.org/info-maps.html>

Executive Summary

The Mahomet Aquifer is one of Illinois' most important groundwater resources, serving as the primary source of drinking water for more than 500,000 people in 15 Illinois counties and providing an estimated 220 million gallons of water per day to communities, agriculture, industry, and rural wells. In 2017, the Illinois General Assembly created the Mahomet Aquifer Protection Task Force (Task Force) to identify gaps in existing aquifer-protection regulations and efforts, specifically by:

- Developing a state plan to maintain the groundwater quality of the Mahomet Aquifer;
- Identifying current and potential contamination threats to the water quality of the Mahomet Aquifer;
- Identifying actions that might be taken to ensure the long-term protection of the Mahomet Aquifer; and
- Making legislative recommendations for the protection of the Mahomet Aquifer.

The Task Force investigated and considered various actions, including legislative actions, to ensure the long-term protection of the Mahomet Aquifer and makes the following prioritized recommendations to the General Assembly and the Governor:

1. Provide \$19.8 million to the Prairie Research Institute (PRI) to use helicopter-based time-domain electromagnetics (HTEM) technology to more accurately map and characterize the Mahomet Aquifer to aid in identifying the connections with other aquifers and surface waters.
2. Use HTEM and other techniques to identify areas where the Mahomet Aquifer is recharged.
3. Integrate data collected via HTEM into next-generation groundwater flow models.
4. Develop and implement source water protection plans pursuant to 35 Ill. Adm. Code 604 Subpart C, after the effective date of adoption, for the community water supplies determined to be susceptible to groundwater contamination.
5. Implement the recommendations outlined for each identified threat and potential threat (as detailed below and in Section III.A) and provide additional funding (\$1 million for one-time equipment acquisition and an additional \$2.3 million annually) to PRI to deploy state-of-the-art monitoring networks and create the analytical capability to identify emerging contaminants of concern.
6. Improve education and outreach regarding the Mahomet Aquifer such that all stakeholders are better informed about water resources, water demand, and water supply planning and management, particularly when plans are made, reviewed, and updated.
7. Develop a group with a mission similar to the Mahomet Aquifer Protection Task Force that is a blend of other select individuals that serve in a quasi-government or government capacity to provide leadership, administrative stature, or process for regional water supply.
8. Plan cooperative research and data collection, analysis, management, and exchange by academic institutions, units of government, the private sector, and other stakeholders.
9. Use the established water supply planning process to review and update regional and local water supply plans at least every five years.
10. Ensure comprehensive use reporting by consistently and fully funding the Illinois Water Inventory Program.

The Task Force identified and described threats and potential threats to the water quality of the Mahomet Aquifer. Underground natural gas storage was a particular focus because in December 2016 a natural gas leak was identified from a Peoples Gas Light and Coke Company underground storage facility in northern Champaign County and within the designated sole-source aquifer boundary for the Mahomet Aquifer. While there is currently not a groundwater quality standard in Illinois for methane, methane can be flammable and explosive when mixed with air, can be an asphyxiant, and can cause problems with the operation of public and private water systems. Illinois EPA referred Peoples Gas to the Illinois Attorney General's Office, which leads ongoing negotiations with Peoples Gas for development of a Groundwater Management Zone for a future consent decree or court order while coordinating with Illinois EPA, the Illinois Department of Natural Resources (IDNR, which has primary jurisdiction over the natural gas leak as the permitting agency for the natural gas storage facility), and the Illinois Department of Health. In 2018, the General Assembly passed a law requiring prompt notification of any future leaks for storage sites within the boundaries of a sole-source aquifer such as the Mahomet Aquifer and annual inspections of gas storage wells by IDNR.

Regarding underground natural gas storage, the Task Force recommends that the General Assembly:

- Incorporate federal law and regulation for underground natural gas storage into state law and empower IDNR to implement that law.
- Establish a trust fund to cover the cost of remediation in the event of a significant environmental incident so immediate remediation can begin.
- Require companies storing natural gas underground to consult with third-party environmental experts in the event of a significant environmental incident to certify their corrective plans and conduct oversight of the cleanup.

Other identified threats and potential threats and the actions the Task Force recommends to address them are:

- **Abandoned wells (potential route of contamination)**
 - Promote well sealing demonstrations and communicate importance to homeowners.
 - Provide resources to better track and keep records of well sealings.
 - Develop online reporting tools for well permitting, drilling, and sealing.
- **Legacy landfills (potential threat of contamination)**
 - Conduct a pilot at the Pekin landfill to establish a trust fund for obtaining certified closure. Use the techniques recommended to evaluate pre-Part 807 landfills in areas with a high potential for aquifer recharge.
 - Train inspectors to use the detailed terrain model templates and instruct staff on how to annotate these images with defects such as depressions, erosion, landslides, barren areas, leachate seeps, trees, and vegetation anomalies.
- **Nitrate (threat of contamination)**
 - Continue to raise awareness of the Nutrient Loss Reduction Strategy (NLRS) and implementation efforts in existence to improve water quality and reduce nutrient loss into Illinois waterways.

- Continue to fund scientific research of agricultural best management practices (BMPs) and wastewater treatment plant technologies that can continue to reduce nutrient loss into Illinois waterways and groundwater.
- Expand cost-share opportunities to farmers to encourage adoption of BMPs that add expense and risk to farming operations.
- Centralize the nitrate concentration data collected by the county public health departments.
- Review nitrate data to determine the location, depth, and construction of wells vulnerable to nitrate contamination.
- Develop recommendations to avoid high-nitrate zones when constructing new wells.
- Discourage the use of shallow sand points.
- Promote the public health guidelines to private well owners concerning setbacks for septic systems, feedlots, and other sources of nitrate.
- **Arsenic (threat of contamination)**
 - Encourage private well owners to test their water for arsenic.
 - Conduct scientific studies to better understand the distribution of arsenic in the aquifer.
 - Promote low-cost water treatment technology.
- **Road salt (threat of contamination)**
 - Expand road salt education and training programs, like those organized by the Tazewell County Health Department, to all the counties over the aquifer.
 - Encourage municipalities and counties to calibrate their road salt spreaders.
 - Monitor chloride trends in public water supply wells
- **Source water susceptible to contamination (threat of contamination)**
 - Develop source water protection plans pursuant to 35 Ill. Adm. Code 604 Subpart C, after the effective date of adoption, for the community water supplies (CWS) determined to be susceptible to groundwater contamination.
 - Implement measures identified in the source water protection plans to protect groundwater using existing authorities (e.g., maximum setback zones, overlay zoning ordinances, pollution prevention, best management practices, regulated recharge areas, local government ordinances, etc.). More information on these authorities is available on the Task Force website.
 - Closely monitor well drilling and well abandonment (potential routes of groundwater contamination) in areas with adopted ordinances or environmental land-use covenants that prohibit new potable well drilling in areas where risk-based remediation has occurred.
- **Household hazardous waste / pharmaceuticals and personal care products (threat of contamination)**
 - Consider implementing some of the measures included in the final report from the Illinois Task Force on the Advancement of Materials Recycling.

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Acronyms

AGO	Illinois Attorney General's Office	ISM	Illinois State Museum
BMP	best management practice	ISWS	Illinois State Water Survey (a division of the Prairie Research Institute)
CWS	community water supplies	LEL	lower explosive limit
EOU	Illinois EPA's Emergency Operations Unit	LiDAR	light detection and ranging
FEMA	Federal Emergency Management Agency	MAC	Mahomet Aquifer Consortium
FOIA	Freedom of Information Act	NLRS	Nutrient Loss Reduction Strategy
GAC	Groundwater Advisory Council	NRCS	Natural Resources Conservation Service
GIS	geographic information system	OWR	IDNR Office of Water Resources
GMZ	groundwater management zone	PGL	Peoples Gas Light and Coke Company
GW	groundwater	PHMSA	Pipeline and Hazardous Materials Safety Administration
HHW	household hazardous waste	PRI	Prairie Research Institute
HTEM	helicopter-based time-domain electromagnetic geophysical survey	PCPP	pharmaceuticals and personal care products
ICC	Illinois Commerce Commission	RCRA	Resource Conservation and Recovery Act
ICCG	Interagency Coordinating Committee on Groundwater	RTK	Right-to-Know
IDNR	Illinois Department of Natural Resources	RWSPC	Regional Water Supply Planning Committee
IDOT	Illinois Department of Transportation	UNGS	underground natural gas storage
IDPH	Illinois Department of Public Health	USEPA	U.S. Environmental Protection Agency
IEMA	Illinois Emergency Management Agency	VN	violation notice
IGPA	Illinois Groundwater Protection Act	VOC	volatile organic compound
ISGS	Illinois State Geological Survey (a division of the Prairie Research Institute)		

I. Introduction

“AQUIFER: Groundwater-saturated soils and geologic materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients.” – Illinois Groundwater Protection Act

The Mahomet Aquifer is one of Illinois’ most important groundwater resources. It serves as the primary source of drinking water for more than 500,000 people in 15 Illinois counties and provides an estimated 220 million gallons of water per day to communities, agriculture, industry, and rural wells. The vertical and horizontal boundaries of the aquifer generally follow the historic Mahomet Bedrock Valley where it enters Illinois from the Indiana border on the east to the Illinois River on the west.

A number of steps have been taken to protect water quality in the aquifer, particularly on the western side, which is one of the areas in the state most geologically susceptible to potential groundwater contamination. Pursuant to Section 17.2 of the Illinois Environmental Protection Act (Act), the Central Priority Groundwater Protection Planning Region (Peoria, Mason, Tazewell and Woodford Counties) was established in 1991 to address these concerns. Over the past 27 years, stakeholders in this region have developed many of the nationally recognized groundwater protection tools that can be used by local governments. <https://www2.illinois.gov/epa/topics/water-quality/groundwater/Pages/default.aspx>

More recently, the United States Environmental Protection Agency (USEPA) on March 11, 2015 designated a portion of the Mahomet Aquifer as a sole-source aquifer. This designation enables the USEPA to review proposed projects that could impact groundwater and that will: 1) be located within the review area; and 2) receive federal funding. This program is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974. Illinois regulations also impose additional requirements on siting a new landfill within 1,200 feet of a sole-source aquifer.

In 2017, the Illinois General Assembly called attention to the important role of the Mahomet Aquifer in supporting life in east-central Illinois. The Mahomet Aquifer Protection Task Force (Task Force) was created by Public Act 100-0403, which took effect on Aug. 25, 2017.

The Task Force was charged with the following:

- Developing a state plan to maintain the groundwater quality of the Mahomet Aquifer;
- Identifying current and potential contamination threats to the water quality of the Mahomet Aquifer;
- Identifying actions that might be taken to ensure the long-term protection of the Mahomet Aquifer; and
- Making legislative recommendations for the protection of the Mahomet Aquifer.

The Task Force subsequently established two subcommittees:

- Subcommittee A – Identifying potential and current contamination threats to the water quality of the Mahomet Aquifer
- Subcommittee B – Identifying actions that might be taken to ensure the long-term protection of the Mahomet Aquifer

Public Act 100-0403 built upon several decades of work by various organizations and scientific researchers, including:

- *Strategy for the Protection of Underground Water in Illinois*, Special Report No. 8 of the Illinois State Water Plan Task Force, October 1984;
- *A Plan for Protecting Illinois Groundwater*, January 1985;
- *Illinois Groundwater Protection Act (IGPA)* (Public Act 85-0863), June 1987;
- *Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois*, October 2009, Mahomet Aquifer Consortium (a not-for-profit corporation formed in 1998 by stakeholders concerned about the sustainability of the Mahomet Aquifer.) In 2010, the consortium expanded its mission to include all water resources in the 15-county area. It includes members from local, state, and federal government; water authorities; water companies; professional groups, and the general public;
- *Action Plan for A Statewide Water Supply Planning and Management Program*, Jan. 5, 2015, Illinois Department of Natural Resources, Office of Water Resources.

As set forth in Public Act 100-0403, the Task Force consists of the following persons:

- One member of the Senate, appointed by the President of the Senate: **Sen. Scott Bennett**, 52nd District
- One member of House of Representatives, appointed by the Speaker of the House of Representatives: **Rep. Carol Ammons**, 103rd District
- One member of the Senate, appointed by the Minority Leader of the Senate: **Sen. Chapin Rose**, 51st District
- One member of the House of Representatives, appointed by the Minority Leader of the House of Representatives: **Rep. Bill Mitchell**, 101st District
- One member representing the Illinois Environmental Protection Agency (Illinois EPA), appointed by the Director of the Illinois EPA: **Alec Messina**, director Illinois Environmental Protection Agency
- Two members representing a national waste and recycling organization, appointed by the Governor: **Charles Hostetler**, PDC Technical Service (chairperson of Subcommittee A); **Eric Ballenger**, Republic Services
- One member representing a statewide environmental organization, appointed by the Governor: **Andrew Rehn**, Prairie Rivers Network
- Three members representing a non-profit consortium dedicated to the sustainability of the Mahomet Aquifer, appointed by the Governor: **Deborah Frank-Feinen**, mayor of Champaign (Task Force chairperson); **Diane Wolfe Marlin**, mayor of Urbana; **Julie Moore-Wolfe**, mayor of Decatur
- One member representing the Illinois State Water Survey of the Prairie Research Institute of the University of Illinois at Urbana-Champaign, appointed by the Governor: **George Roadcap**, Illinois State Water Survey/Prairie Research Institute
- One member representing a statewide association representing the pipe trades, appointed by the Governor: **Lynn Karner**, Illinois Pipe Trades Association
- One member representing the State's largest general farm organization, appointed by the Governor: **Steve Turner**, Illinois Farm Bureau

- One member representing a statewide trade association representing manufactures, appointed by the Governor: **Donovan Griffith**, Illinois Manufacturers' Association
- One member representing a community health organization located over the Mahomet Aquifer, appointed by the Governor: **Claudia Lennhoff**, Champaign County Healthcare Consumers
- Seven members representing local government bodies located over the Mahomet Aquifer, appointed by the Governor: **David Zimmerman**, Tazewell County; **Larry Stoner**, mayor of Monticello (chairperson of Subcommittee B); **Jim Risley**, Mahomet-Seymour School District; **Teresa Barnett**, DeWitt County Emergency Management Agency; **Chris Koos**, mayor of Normal; **Todd Zalucha**, mayor of Heyworth; **Charles Smith**, mayor of Rantoul
- One member representing a State labor organization that represents employees in the solid waste, recycling, and related industries, appointed by the Governor: **Keith Gleason**, Teamsters Local 627
- One member representing a statewide business association with a focus on environmental issues, appointed by the Governor: **Alec Davis**, Illinois Environmental Regulatory Group

The Task Force and Subcommittees met 25 times between February and December 2018. All meetings were subject to the Open Meetings Act and open to the public. Agendas, public notices, draft minutes and presentations, public comments, and other materials are posted on the Illinois Environmental Protection Agency's website at <https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-force/Pages/default.aspx>.

Appendix A lists the presentations and reference materials that were provided to the Task Force and the public to assist in developing short-term and long-term measures to protect the quality and quantity of water in the Mahomet Aquifer system.

II. Potential and Current Contamination Threats to the Water Quality of the Mahomet Aquifer

Subcommittee A was tasked with "identifying potential and current contamination threats to the water quality of the Mahomet Aquifer." In pursuing this exercise, Subcommittee A focused on:

- instances where contaminants are or have recently been in the aquifer that appear to require treatment, have degraded the natural water quality, and/or are present in concentrates that exceed Class I: Potable Resource Groundwater Standards promulgated in 35 IAC 620.410. We defined these as **threats**.
- instances where source materials have been impounded without source controls, without regulatory requirements, and with no groundwater monitoring programs, that are located over the Mahomet Aquifer in areas relatively susceptible to infiltration. We defined these as **potential threats**.
- abandoned and improperly plugged wells. We defined these as **potential routes**.

Appendices B and C detail the process that Subcommittee A used to identify potential sources of groundwater contamination pursuant to IGPA. Subcommittee A identified the following potential routes, potential threats, and threats to the Mahomet Aquifer system:

- **Potential route**
 - Abandoned wells
- **Potential threat**
 - Legacy landfills
- **Threat**
 - Arsenic (naturally occurring)
 - Road salt
 - Source water susceptible to contamination
 - Household hazardous waste (HHW) and pharmaceuticals and personal care products (PCPPs)
 - Nitrate
 - Underground natural gas storage

Subcommittee A then developed the following worksheets addressing each identified potential route of contamination, potential threat of contamination, and threat of contamination.

Aquifer Protection Worksheet: Abandoned Wells

Subcommittee A Classification: Potential Route

Issue: Abandoned and poorly sealed wells can become a potential route for contaminants at the surface to reach the Mahomet Aquifer by bypassing the naturally occurring clay layers that overlie and protect the aquifer. In rural areas, abandoned water wells can be found on old home sites or existing homes where a new well was drilled with a higher capacity or better water quality. In urban areas, water wells can often be found at abandoned industrial facilities or at inactive self-supplied users, such as an old movie theater that used groundwater for air conditioning prior to the advent of modern systems. The locations of many of the old abandoned wells are unknown. Reporting of new wells to public health departments was not required until 1967 and reporting of well sealings did not occur until the 1990s. The Illinois State Water Survey (ISWS) and Illinois State Geologic Survey (ISGS) well records database (Figure 1A) has information on roughly 50 percent to 60 percent of the existing wells based on some field surveys. The Illinois Water Well Construction Code requires the owner of a water well, boring, or monitoring well to properly seal the well within 30 days of abandonment or when it is no longer used.

Prospecting for oil and gas with deep wells has occurred across the Mahomet Aquifer region, although the only economically significant pools of oil occur just off the aquifer in Piatt, Macon, and DeWitt Counties. Figure 1B shows the locations of the well records of the ILOIL database maintained by the ISGS. Illinois has had oil and gas well regulations since 1939 that include proper cementing and abandonment procedures, which should prevent upward contamination of the Mahomet Aquifer with saline water from deeper formations. Unfortunately, the abandonment status is unknown for many of the deep wells drilled prior to 1939 and for many additional wells drilled afterward that have incomplete records in the ISGS files.

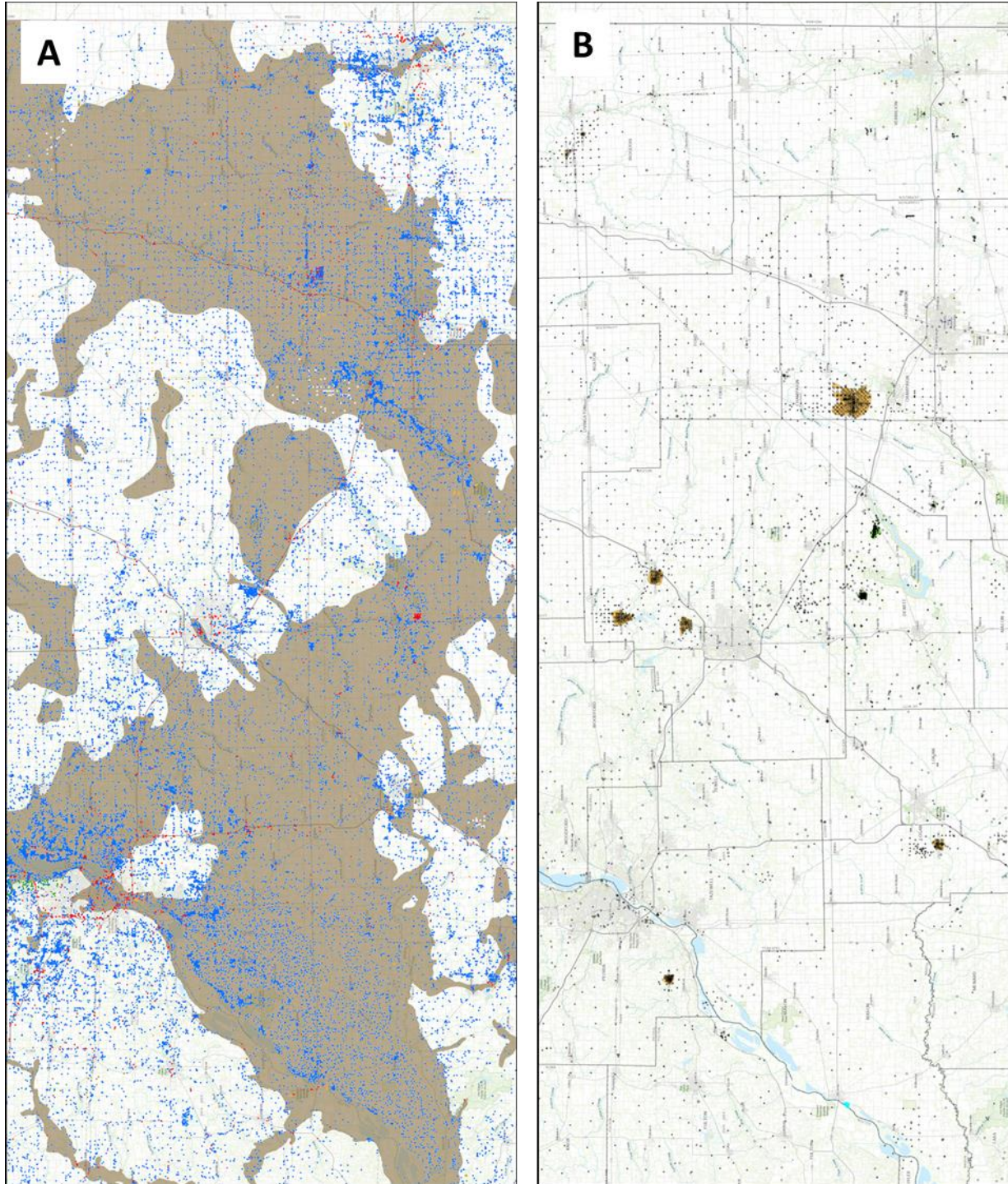


FIGURE 1 (A) LOCATION OF WATER WELL RECORDS (BLUE DOTS) OVER THE MAHOMET AQUIFER IN THE ISGS ILWATER DATABASE AND (B) LOCATION OF OIL AND GAS WELL RECORDS (BLACK DOTS) FROM THE ISGS ILSOIL DATABASE.

Aquifer Protection Worksheet: Legacy Landfills

Subcommittee A Classification: Potential Threat

Issue: In 1970 the Illinois General Assembly passed the Illinois Environmental Protection Act, which created the Illinois Environmental Protection Agency and the Illinois Pollution Control Board. In turn, the Board created solid waste landfill regulations in the Illinois Administrative Code (known as the 35 IAC 807 regulations). Prior to this time, landfills either were not regulated or were regulated by local or state public health departments. Some of these pre-807 sites, and a limited number of 807 solid-waste landfills, did not have source controls (i.e., may have disposed of what is now hazardous waste before the promulgation of RCRA in 1976), did not have groundwater monitoring programs, and did not have effective engineering controls (e.g., liners, leachate removal systems, and landfill gas collection and control systems). These are also known as “legacy landfills” and were commonly called “dumps.”

Using waste disposal practices that were common only 25 years ago most of the “legacy landfills”—i.e., unlined, thinly covered, dumps and landfills—were operated and closed before adoption of current state and federal regulations. These “cemetaries of waste” pose a contamination threat to the Mahomet Aquifer (Figure 2).

Legacy landfill structures (all dots, Figure 2) were often poorly situated along streams and wetlands, in gravel pits and quarries, low-lying areas, etc.; excavated into weathered (porous) soil materials; and thinly covered with as little as 6 to 18 inches of compacted earth at closure. Figure 2 shows the locations of 218 potential legacy landfill sites overlying the Mahomet Aquifer¹, all of which may pose a potential threat to shallow aquifers, surface water, and the Mahomet Aquifer. There are likely landfills at locations that are unrecorded.

By one estimate, as much as 50 percent of annual precipitation infiltrates the thin, uneven, ill-constructed, weathered earthen covers, mixes with wastes, and transmits contaminated leachates into accessible groundwater systems². Of the legacy landfills, nearly one-half (94, green dots, Figure 2) lie within 20 feet above mapped shallow aquifers, which can distribute leachates laterally as well as vertically by connecting with sand channels, fractures and well bores, allowing contaminants to flow into deeper aquifers. Moreover, it can be anticipated that changes over time to a warmer, wetter climate here will increase erosion of covers and increase infiltration into landfill wastes and so increase leachate volumes.

¹ Mehnert, E., and Keefer, D. A. (1988). Statewide inventory of land-based disposal sites: An update, Illinois Department of Energy and Natural Resources, Hazardous Waste Research and Information Center, Champaign, IL, HWRIC RR020, WMRC RR-E20, 28 pp. (electronic version).

² Hughes, G. M., Landon, R. A., and Farvolden, R. N. (1971). Hydrogeology of solid waste disposal sites in northeastern Illinois: A final report on a solid waste demonstration grant project (no. SW-12d), U.S. Environmental Protection Agency.

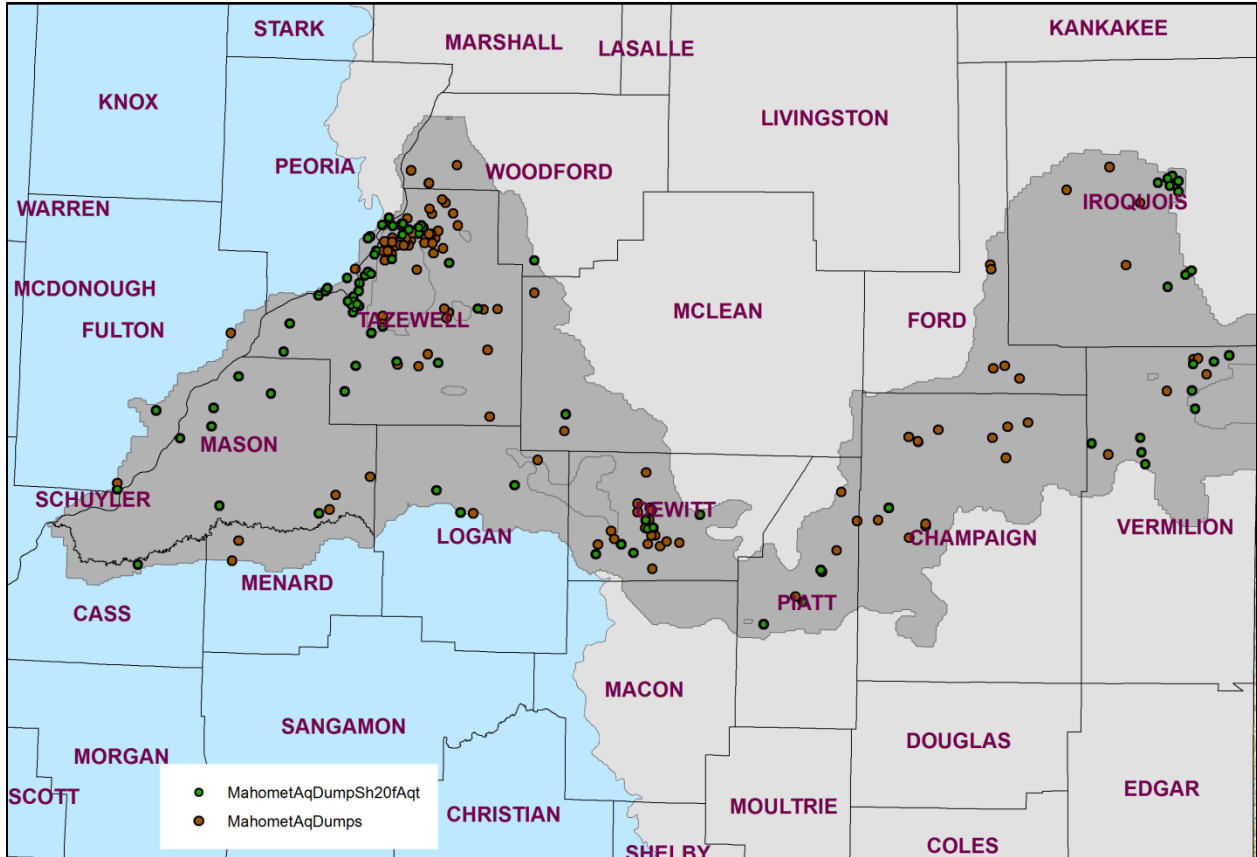


FIGURE 2: LOCATIONS OF KNOWN LEGACY LANDFILLS OVER THE MAHOMET AQUIFER (ALL DOTS). GREEN DOTS SHOW LOCATIONS OVER SHALLOW AQUIFERS MAPPED WITHIN 20 FEET OF THE LAND SURFACE. RED DOTS INDICATE THERE ARE NO INTERVENING SHALLOW AQUIFERS. (MEHNERT AND KEEFER, 1988)

To assist the Task Force due to their concern with legacy landfills, Illinois EPA staff prepared a list of 807 solid-waste landfills that overlie the Mahomet Aquifer from their Solid-Waste Database of 25 Part 807 Landfills (5 Part 811 Landfills), as shown in Figure 3. These sites were overlain, using Illinois EPA's geographic information system (GIS), on the *Illinois Potential for Aquifer Recharge Map*. This map was developed by the IGS pursuant to Section 17.2 of the Act to specifically assist in regional groundwater protection planning.

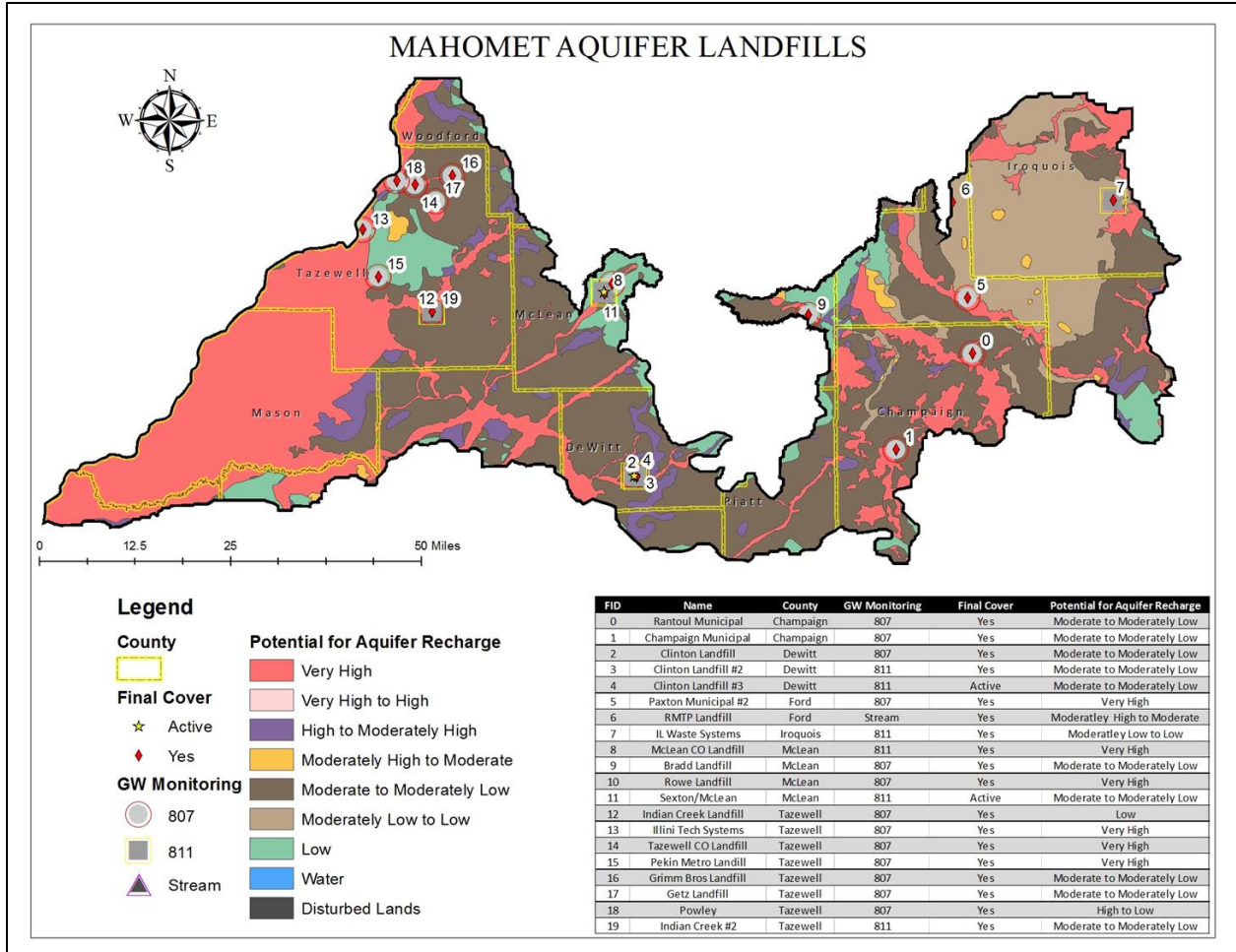


FIGURE 3: PART 807 AND 811 LANDFILLS LOCATED ABOVE THE MAHOMET AQUIFER SYSTEM RELATIVE TO ILLINOIS POTENTIAL FOR AQUIFER RECHARGE MAP (ILLINOIS EPA, 2018).

Illinois EPA identified the following Part 807 landfills in areas with a high to moderately high potential for aquifer recharge (Figure 3):

- Map ID 5: Paxton #2 (Ford County)
- Map ID 14: Tazewell RDF (Tazewell County)
- Map ID 13: Illinois Technical Systems (Tazewell County)
- Map ID 10: Rowe Construction Company (McLean County)
- Map ID 15: Pekin Metro Landfill (Tazewell County).

Next, inspectors in the appropriate regional field offices further researched these sites using criteria listed below. Unlike the pre-807 landfills, these landfills have covers and groundwater monitoring systems. Additionally, Illinois EPA reviewed all of the files for these sites, including inspection reports, groundwater monitoring, corrective action, permit closure certification status, and enforcement actions.

Further, Illinois EPA developed summaries of these detailed reviews, including maps of the landfills proximate to potable water supply wells (i.e. private, semi-private, non-community and community water supply wells) and a Light Detection and Ranging (LiDAR) terrain model. This information is

included in Appendix D. High-resolution versions of LiDAR terrain model maps have been created in the Illinois EPA GIS. In addition, templates for these LiDAR terrain model maps have been developed for field staff for use during their inspections.

The next step of this process is to develop a training module for instruction on using the LiDAR Terrain Model Template and on how to further annotate these images with defects such as depressions, erosion, landslides, barren areas, leachate seeps, trees, and vegetation anomalies using the ArcGIS hydrology and image processing programs based upon cues in Stohr and Filippini (2018)³.

The Task Force advocates an evaluation of the legacy landfills overlying the sole-source aquifer, including conducting targeted studies of hydrogeology and water quality threats of prioritized legacy landfills using published literature, GIS, and remote sensing technology⁴.

Legislative Recommendations

Direct the ISGS/ISWS/Illinois EPA to:

1. Identify legacy landfills for priority inspection using existing information available from ISGS, ISWS, PRI, IDNR, IEMA, FEMA, NRCS, and other agencies. Focus further study on those that pose a hazard to surface water and groundwater resources. Illinois EPA should consider the following factors in developing the prioritization:
 - a. Landfills over unsuitable geology (ISGS)
 - b. Landfills over shallow aquifers (ISGS)
 - c. Abandoned landfills (ISGS, Illinois EPA)
 - d. Landfills within or in proximity to 100-year floodplains (ISWS, FEMA, IEMA)
 - e. Landfills near dwellings and private wells (NRCS, ISGS, ISWS)
 - f. The results of the Illinois EPA pilot program discussed above and in Appendix D
 - g. USEPA grant conditions
2. Collect and archive institutional information about old landfills for present (as in #1) and long-term use, including manifests and engineering records. This data is available from Illinois EPA, municipalities, counties, solid waste management associations, companies and corporations, and individuals (mainly inheritors of property owned by family members). Records should be available for sole use as confidential information by regulatory agencies but not subject to the Freedom of Information Act (FOIA).
3. Assemble location information about industries and companies that generate(d) wastes, including from historical processes. Information is available from corporations, companies, ISM, ISGS, ISWS, IEMA, FEMA, and universities. Records should be available for use as confidential information by regulatory agencies but not subject to FOIA.

Propose legislation to direct Illinois EPA to:

³ Stohr, C and H. Filippini. 2018. Enhanced Field Inspections of Closed Landfills Using Aerial Orthophotography in Illinois, USA. *Journal of Hazardous, Toxic, and Radioactive Waste*. American Society of Civil Engineers. Volume 22, No. 1. Published online Sept. 14, 2017.

⁴ Ibid.

4. Update current methods and increase training of inspectors to incorporate remote sensing (aerial photography and LiDAR), GIS, and database management to guide field inspections of all legacy landfills. This would include:
 - a. Preparation of georeferenced image maps showing defects such as depressions, erosion, landslides, barren areas, leachate seeps, trees, and vegetation anomalies using LiDAR and aerial photography and image processing/enhancement for use in field inspections. Georeferenced image maps should be prepared by inspectors (ideally) trained in image processing of remote sensing imagery and GIS, trained technicians, or expert remote sensing specialists.
 - b. Training of inspectors to use GIS and remote sensing technology to track defects, structures, appliances, and wells for routine inspection and sustainable management for closed landfills.
 - c. Regular update knowledge and skills of landfill inspectors should be required to maintain legacy landfills and reduce risk of contamination of surface water and groundwater.

Propose legislation that will:

5. Promote community support for subsequent use and maintenance of legacy landfills where this can be safely done. This can be accomplished by:
 - a. Conducting a pilot project at the Pekin Metro landfill to establish a trust fund for obtaining certified closure. Use the techniques recommended to evaluate pre-Part 807 landfills in areas with a high potential for aquifer recharge.
 - b. Financial incentives for private- or corporate-owned legacy landfills to enter into partnerships with forest preserve districts, park districts, and conservation clubs to provide funding for a higher level of maintenance and promote subsequent use of former landfills.
 - c. Financial incentives for publicly owned legacy landfills to enter into partnerships with forest preserve districts, park districts, and conservation clubs as a means to provide funding for a higher level of maintenance and promote subsequent use of former landfills.

Aquifer Protection Worksheet: Nitrate

Subcommittee A Classification: Potential threat

Issue: Nitrate-nitrogen (NO₃-N, nitrate) is the most common human contaminant in groundwater in the world. The drinking water standard is 10 mg/L. There are many sources of nitrate, including agricultural activities (fertilizers, soil tilling, livestock manure) and human waste (sewage and septic discharge). Studies in Illinois aquifers suggest that concentrations of nitrate greater than 2 or 3 mg/L are indicative of human contamination. Elevated nitrate concentrations are not a concern in most of the Mahomet Aquifer system, particularly where the aquifer is confined. In the confined region, the age of the groundwater is typically hundreds to thousands of years old. Elevated nitrate is common in the unconfined region of the Mahomet Aquifer system, in Mason and Tazewell Counties. In this region, aquifer sands are near the surface and not protected by thick glacial tills, thus the aquifer is vulnerable to contamination from a variety of land-use activities. It should be noted that nitrate is often removed in aquifers by a bacterially mediated reaction known as denitrification. As oxygen becomes depleted in groundwater, denitrifying bacteria can become active and convert nitrate to nitrogen gas in the

presence of organic material. Thus, nitrate is often depleted in deeper parts of aquifers, even when it is found to be elevated in shallower recharge zones.

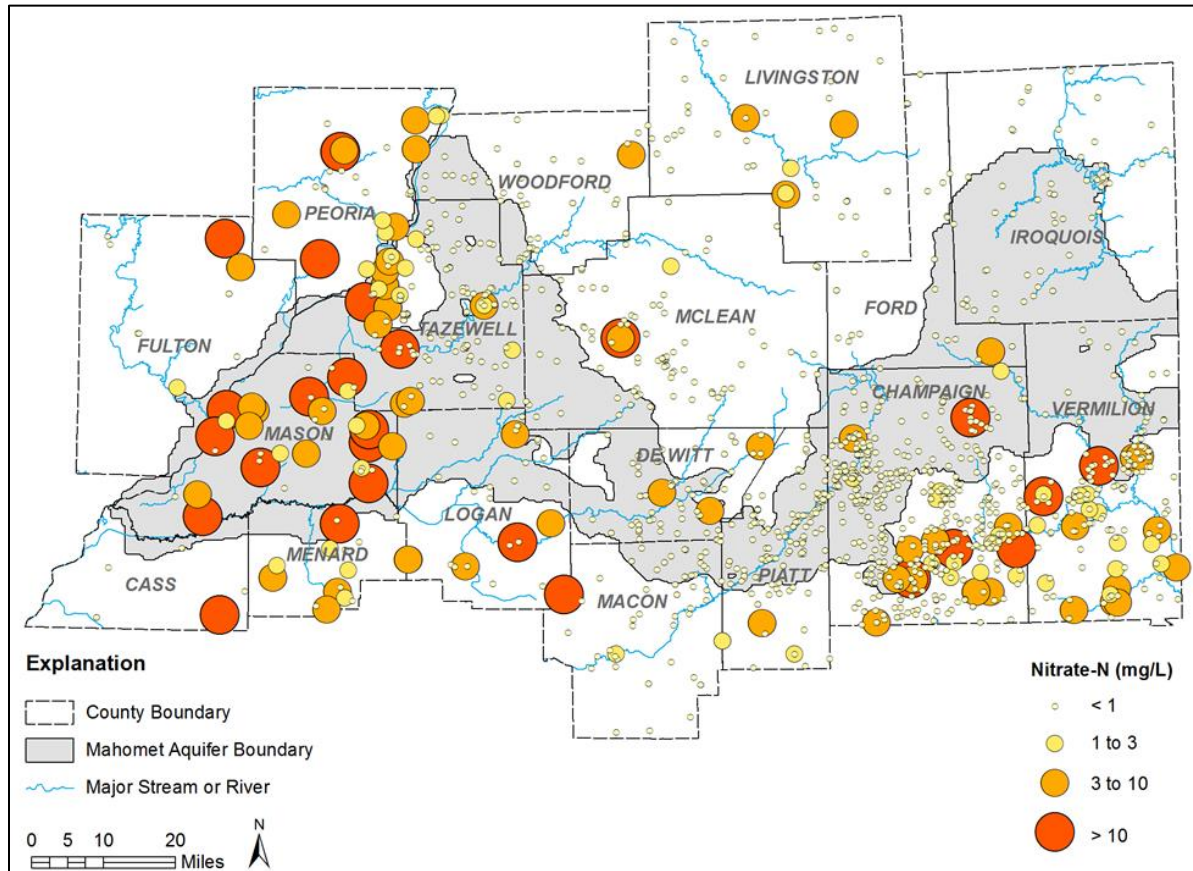


FIGURE 4: NITRATE-N CONCENTRATIONS IN THE MAHOMET AND SHALLOWER AQUIFERS.

Figure 4 shows the distribution of nitrate concentrations in the Mahomet Aquifer region. The map includes 1,589 samples collected since 2000 from both the Mahomet and shallower sand and gravel aquifers found in the ISWS’s groundwater quality database. More than 90 percent of the samples have very low concentrations, less than 1 mg/L. Less than 2 percent are above the drinking water standard, with a third of those from Mason County where the aquifer is unconfined.

The Illinois Nutrient Loss Reduction Strategy (NLRS) was developed by Illinois EPA, the Illinois Department of Agriculture (IDOA), and a multi-stakeholder policy working group that included federal and state agencies, industry, agriculture, wastewater treatment agencies, and non-governmental organizations. The initial NLRS was released in July 2015 and is a framework for leveraging existing programs to optimize nutrient loss reduction while promoting collaboration, research, and innovation among the private sector, academia, non-profits, wastewater treatment agencies, the agricultural sector, and state and local government. The primary strategy goals are to reduce annual loading of nitrate and total phosphorus to the Mississippi River and address the impacts on local water quality. The ultimate goal is to achieve 45 percent loss reductions in both nitrate and total phosphorus with the interim loss reduction goals of 15 percent nitrate-nitrogen and 25 percent total phosphorus by 2025.

For more information on the NLRs, see <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/excess-nutrients/Pages/nutrient-loss-reduction-strategy.aspx>.

Aquifer Protection Worksheet: Arsenic

Subcommittee A Classification: Threat (naturally occurring)

Issue: Arsenic is the most widespread natural contaminant of groundwater worldwide. Small amounts of arsenic are common in many unconsolidated aquifer materials (sands and gravels) deposited by glaciers or rivers. Under certain geochemical conditions, arsenic is released from the solid materials into the groundwater.

There are several areas in the Mahomet Aquifer system where arsenic is found above its drinking water standard (10 µg/L). Elevated arsenic in the Mahomet Aquifer is of the most concern in the western confined region, primarily in Tazewell County. Central parts of the aquifer can also have elevated levels, especially along the aquifer valley walls. The discontinuous overlying aquifers (Glasford, Pearl) can also have elevated concentrations of arsenic. In fact, the highest arsenic concentrations in Illinois have been found in these shallower aquifers. There is a great deal of variability in arsenic concentrations in the Mahomet Aquifer system, making it difficult to predict accurately where elevated levels might be found.

Domestic well owners with elevated arsenic levels commonly use reverse osmosis or other point-of-use treatment systems to lower arsenic concentrations below the drinking water standard.

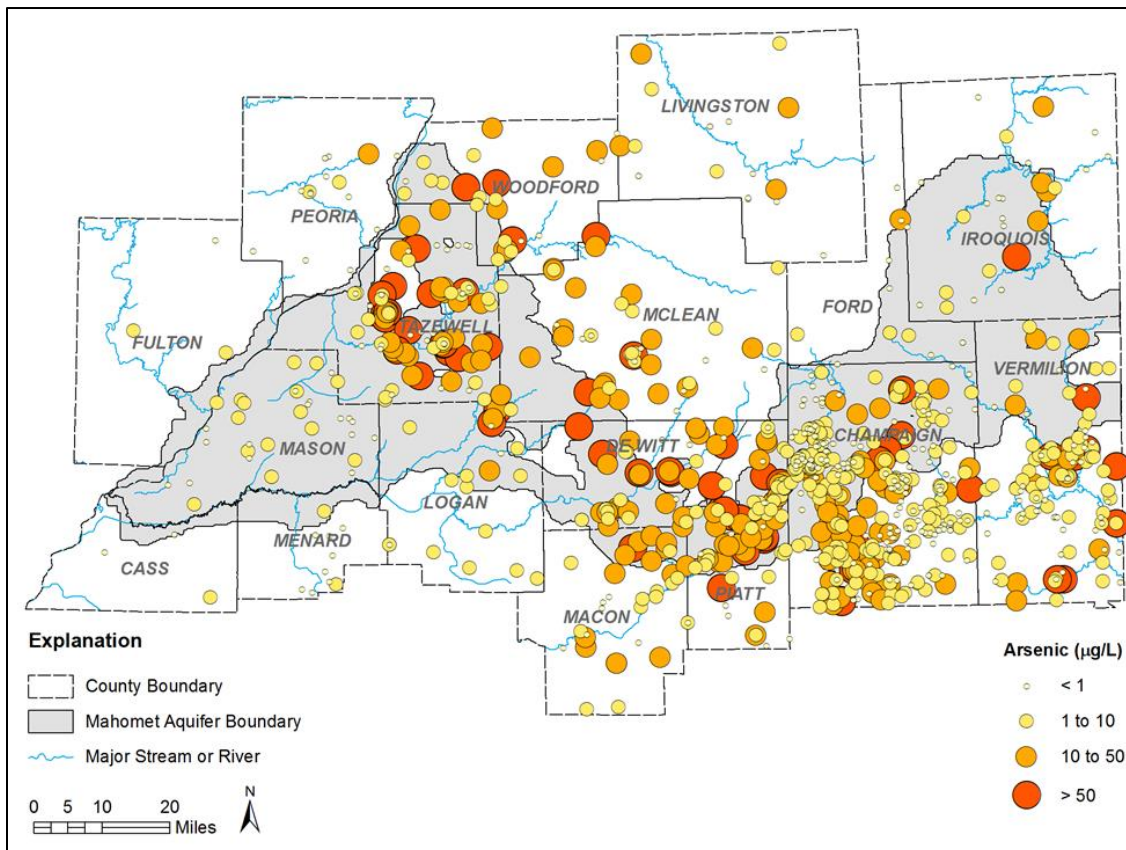


FIGURE 5: ARSENIC CONCENTRATIONS IN THE MAHOMET AND SHALLOWER AQUIFERS. (ILLINOIS STATE WATER SURVEY)

Figure 5 shows the distribution of arsenic concentrations in the Mahomet Aquifer region. The map includes 1,069 samples collected since 2000 from both the Mahomet Aquifer and shallower sand and gravel aquifers found in the ISWS's groundwater quality database. About 30 percent of the samples have concentrations greater than the drinking water standard, while about 8 percent have concentrations greater than the old drinking water standard (50 µg/L), which was superseded in 2006.

Aquifer Protection Worksheet: Road Salt

Subcommittee A Classification: Threat

Issue: Salt (sodium chloride) applied to roads as a deicing agent can run off roadways and infiltrate through the soil into groundwater. Chloride is largely non-reactive in the subsurface and will accumulate in an aquifer over time. In northeastern Illinois, over 55 percent of public water supply wells have an increasing trend in chloride. Communities and private well owners that use salt softening to control the hardness of their groundwater further increase the sodium and chloride levels in their drinking water. Neither chloride nor sodium are toxic to humans, and chloride has a secondary standard of 250 milligrams per liter (mg/L). A sodium concentration of less than 20 mg/L is recommended for people with hypertension.

Some of the highest chloride concentrations in the Mahomet Aquifer (Figure 6) occur in western Tazewell County where there is higher density of roadways and the aquifer is unconfined. The high chloride values in Piatt and DeWitt Counties are likely due to the influx of brine from the underlying bedrock.

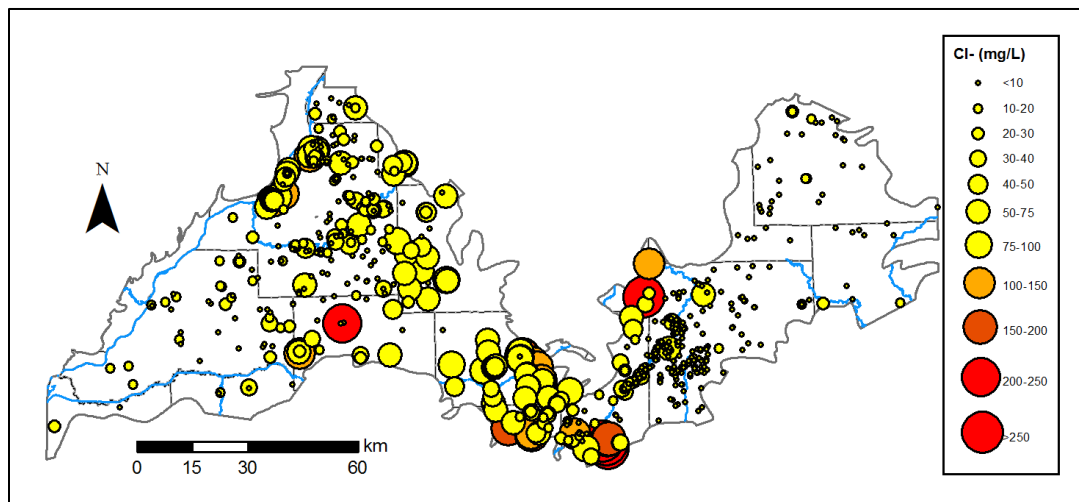


FIGURE 6: CHLORIDE CONCENTRATIONS IN THE MAHOMET AQUIFER. (ISWS)

Aquifer Protection Worksheet: Source Water Susceptible to Contamination

Subcommittee A Classification: Threat

Issue: Susceptibility should continue to be used as a guide for development of appropriate wellhead protection programs. Figures 7 and 8 illustrate Illinois' source water susceptibility and protection program processes.

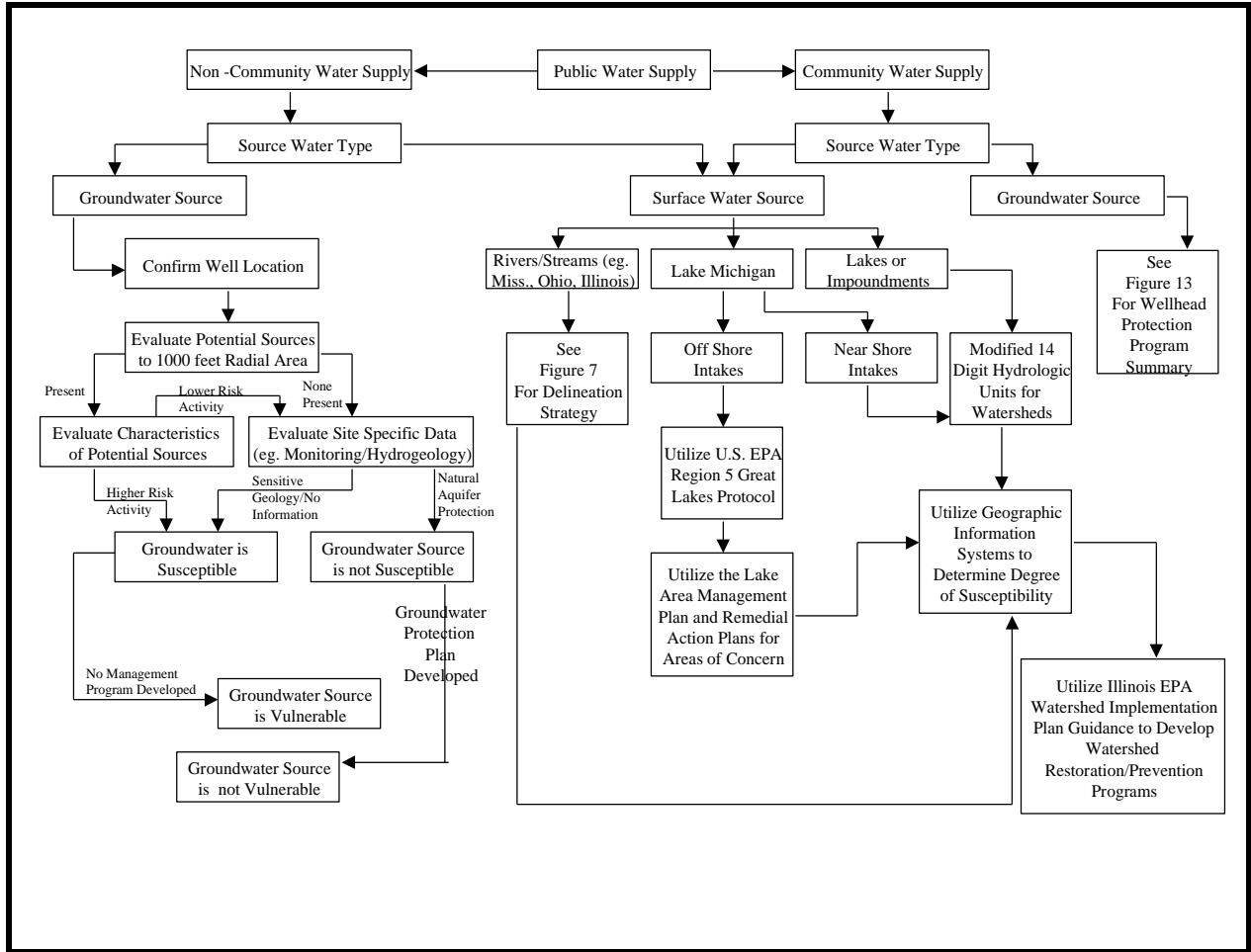


FIGURE 7: ILLINOIS SOURCE WATER SUSCEPTIBILITY AND PROTECTION PROGRAM PROCESS

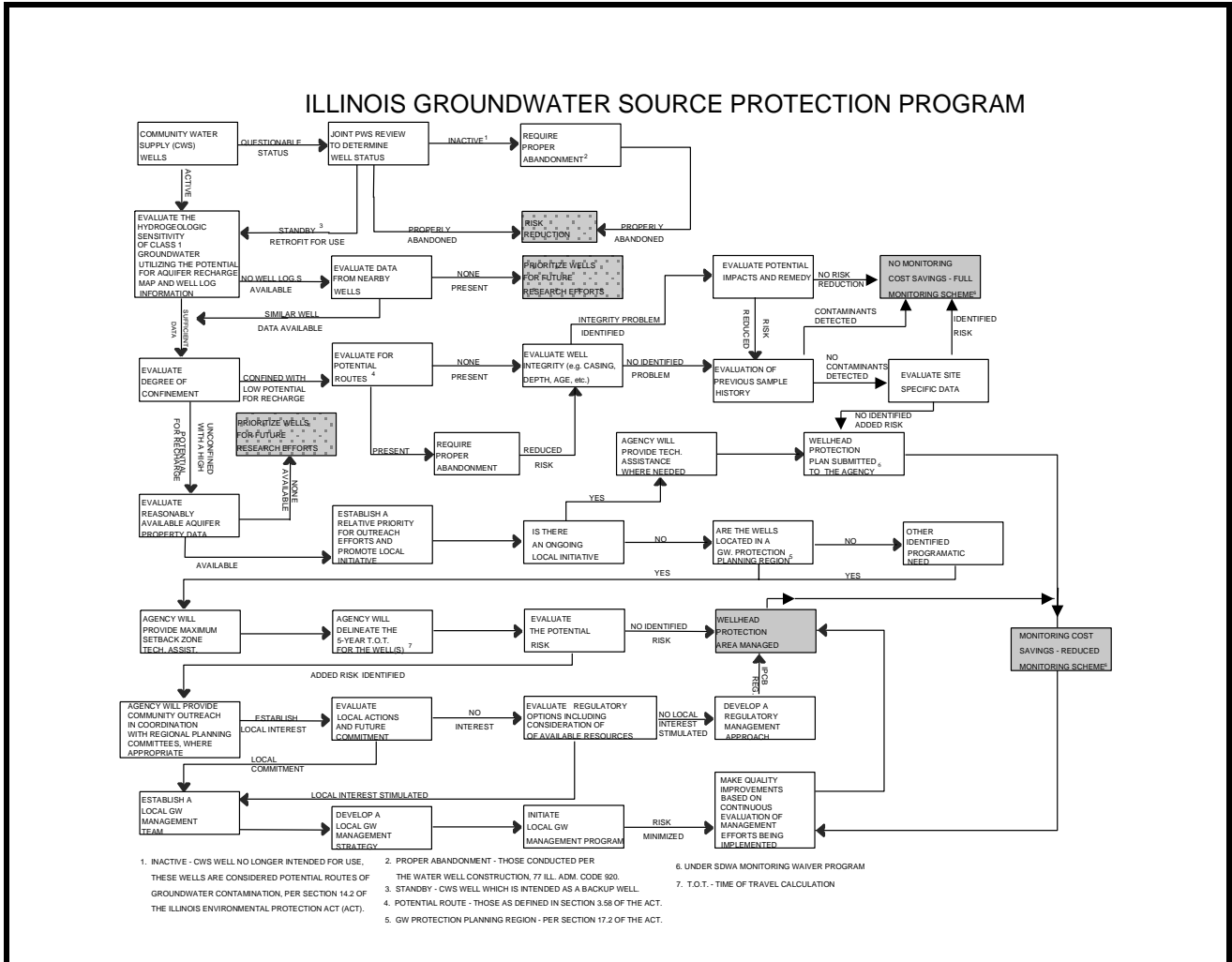


FIGURE 8: ILLINOIS GROUNDWATER SUSCEPTIBILITY AND PROTECTION PROGRAM PROCESS

Illinois EPA conducted source water assessments using the process detailed in Figure 8 to determine the susceptibility of the wellhead protection area to contamination. These susceptibility determinations were published in source water assessment fact sheets that are available at <https://www2.illinois.gov/epa/topics/water-quality/swap/Pages/default.aspx>. In addition, Illinois EPA went through each of the 121 fact sheets for community water supplies (CWS) located within the boundary of the Mahomet Aquifer and summarized the susceptibility determination and protection efforts status. This spreadsheet is posted on the Task Force website as a resource.

Aquifer Protection Worksheet: Household Hazardous Waste and Pharmaceuticals and Personal Care Products

Subcommittee A Classification: Threat

Issue: Common household products can be highly toxic, flammable, explosive, or corrosive, the same as hazardous waste that is highly regulated from commercial and industrial processes. Pharmaceuticals and personal care products (PPCPs) can easily enter the water system, both before and after passing through a human system. Both household hazardous wastes (HHWs) and PPCPs can have adverse environmental impacts, depending on their use and disposal method.

Common household products that are hazardous to the environment are just that: common. And while one resident dumping the unused portions of lawn chemicals, herbicides, pesticides, oil-based paint, or old gasoline down a sink, storm drain, or on the ground may seem like a small-scale problem, it becomes a much larger issue when one considers that many residents have the same types of unused HHW that they need to dispose of and that they typically do not have the opportunity to do so safely throughout most of Illinois, including over the Mahomet Aquifer.

The problem of PPCPs is similarly one of scale. The amount of PPCP contamination generated by one person or a small group is minimal, but the amount of PPCP contamination generated by many people in a relatively small area can have considerable environmental impacts.

Based on USEPA data, Champaign County alone has the potential to generate 1.6 million pounds of HHW per year. Improper disposal of HHW can affect air, land, and water quality. Improper disposal of unwanted PPCPs, often considered a subset of HHW, can pose health and environmental risks.

Regarding HHW, Central Illinois residents who live over the Mahomet Aquifer have limited options to safely dispose of HHW. Since 1989, the Illinois EPA has provided one-day HHW collection program across the state, but financial resources for the program are not dependable. One-day HHW collections held without the support of Illinois EPA covering the collection and processing costs of HHW range in cost from \$100,000 to \$120,000 each, with most of the expense associated with the contractor's transport and processing of collected HHW. Costs for a county or municipal joint action agency to establish a permanent HHW collection facility include initial capital costs, operational costs, and transport and processing costs, with transport and processing costs alone estimated at approximately \$200,000 per year. At present, in Illinois, the Illinois EPA serves as generator and pays for HHW transport and processing costs at the few permanent HHW collection facilities, all in the northern tier of the state (Rockford, Gurnee, Chicago, and Naperville).

Aquifer Protection Worksheet: Underground Natural Gas Storage

Subcommittee A Classification: Threat

Issue: Illinois has no significant sources of natural gas and must rely on other states to supply this fuel via pipelines. To meet the volume and timing of the demand, Illinois has the largest amount of natural gas storage in saline (i.e., deep geologic) formations in the nation, totaling 780 billion cubic feet. In Illinois, utilities have been effectively storing natural gas in the subsurface for over 50 years, however, over the past several years, natural gas leakage has occurred at multiple sites in Illinois, likely as a result of aging infrastructure. In December 2016, a natural gas leak was identified at the surface near a storage

well (i.e. McCord #2) in the Manlove Natural Gas Storage Field operated by Peoples Gas Light and Coke Company (PGL) in northern Champaign County and within the designated sole-source aquifer boundary for the Mahomet Aquifer (See Figure 9. Well integrity of one natural gas storage well was identified as a cause. Natural gas is predominantly composed of methane, CH₄. Groundwater sampling subsequently identified a specific type of methane, called thermogenic methane, which is associated with stored natural gas, in multiple adjacent private water wells.

Most natural gas was created over time by two mechanisms: *biogenic* and *thermogenic*. Biogenic gas is created by methanogenic organisms in marshes, bogs, landfills, and shallow sediments. Very little if any of the heavier hydrocarbons are produced during methanogenesis. Deeper in the earth, at greater temperature and pressure, thermogenic gas is created from buried organic material that is baked over geologic time.

Previous ISGS studies of groundwater in central Illinois have shown that groundwater from the Mahomet Aquifer and the shallower Glasford sands often naturally contains a few milligrams per liter (mg/L) of methane to concentrations greater than the saturation limit for methane of 28 mg/L⁵. Water will light at these naturally occurring concentrations.

Mitigation activities that have occurred in response to the natural gas leak:

- venting and flaring of the thermogenic gas released in the aquifer since July 2017 in the McCord #2 well at a rate of approximately 20,000 cubic feet (cf)/day at 500 pounds per square inch (psi). Recently, they have been leaving the well shut in and only flaring once a week. There is about 50 psi of pressure on the well, and it currently is not producing much gas
- installation of gas water separators in the homes whose private wells were contaminated by the McCord #2 release,
- a first agreed to interim order (No. 17 CH 218) was finalized on Oct. 20, 2017 (See <https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-force/Pages/default.aspx>)
- three additional relief wells were installed, and industrial separators were permitted, but the wells were not in an optimum location and did not flow
- four new stratigraphic borings were drilled and pumping tests were performed on the previously drilled relief wells to obtain information necessary to do groundwater modeling to predict the location of the remaining free gas as illustrated in Figure 9

⁵ Chemical and isotopic indicators of groundwater evolution in the basal sands of a buried bedrock valley in the midwestern United States: Implications for recharge, rock-water interactions, and mixing. Keith C. Hackley, Samuel V. Panno and Thomas F. Anderson. *Geological Society of America Bulletin* 2010;122;1047-1066 doi: 10.1130/B26574.1

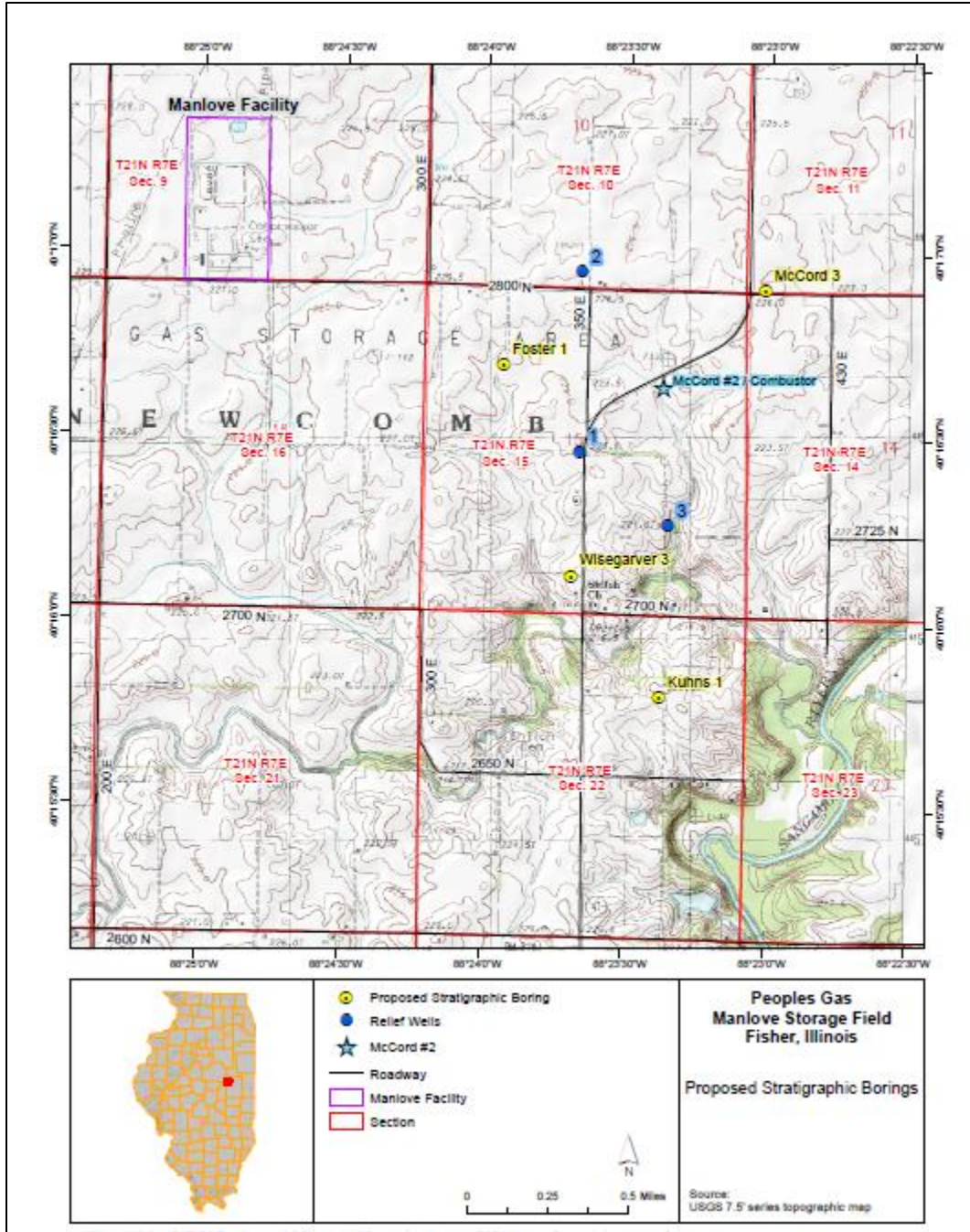


FIGURE 9: LOCATION OF THE MANLOVE GAS STORAGE FIELD WHERE A NATURAL GAS LEAK WAS IDENTIFIED IN DECEMBER 2016.

There is currently not a groundwater quality standard in Illinois for methane. However, methane can be flammable and explosive when mixed with air, can be an asphyxiant, and can cause problems with the operation of public and private water systems.

Although there is no numerical groundwater standard for thermogenic methane, Part 620 does include a narrative nondegradation standard:

Section 620.301 General Prohibition Against Use Impairment of Resource Groundwater

- (a) No person shall cause, threaten or allow the release of any contaminant to a resource groundwater such that:
 - (1) Treatment or additional treatment is necessary to continue an existing use or to assure a potential use of such groundwater; or
 - (2) An existing or potential use of such groundwater is precluded.

Illinois EPA has referred PGL to the Illinois Attorney General's Office (AGO) pursuant to a violation of Section 12(a) of the Act and part 6201.301. The Illinois Department of Natural Resources (IDNR) has primary jurisdiction over the natural gas leak as the permitting Agency of the Manlove Field facility. While Illinois EPA does not regulate private wells that were found to be contaminated by the leak, the Agency opted to conduct independent sampling to provide information on the extent of groundwater contamination resulting from the natural gas leak, as the Agency does have legal authority over potential groundwater contamination. Following the sampling, which began in October 2017, Illinois EPA issued a violation notice (VN) to PGL in December 2017. The case was subsequently referred to the AGO on Jan. 5, 2018. Appendix E contains further details on the AGO's negotiations with PGL (and involving the Illinois EPA, IDPH, and IDNR) to develop a Groundwater Management Zone (GMZ) under a future consent decree or court order.

Related legislative actions

In 2018, HB4746 was signed into law and requires prompt notification of any future leaks for storage sites within sole-source aquifer boundaries (e.g., the Mahomet Aquifer boundary) and annual inspections of gas storage wells by IDNR.

SB3549 creates the Illinois Underground Natural Gas Storage Safety Act and amends the Illinois Gas Pipeline Safety Act, 220 ILCS 20. The Illinois Gas Pipeline Safety Act incorporates the minimum federal safety standards for the transportation of gas and for pipeline facilities. Recent changes to federal law, beginning with the PIPES Act of 2016, specifically included underground natural gas storage (UNGS) facilities into the definition of pipeline facilities and required that the downhole portion of the UNGS facilities be regulated by the U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). Under the current version of the Illinois Gas Pipeline Safety Act, the Illinois Commerce Commission (ICC) has authority over all intrastate natural gas pipeline facilities in the state. This includes the pipeline infrastructure as well as the UNGS infrastructure.

SB3549 defines the downhole portion of the UNGS facilities and incorporates the minimum federal safety standards for the downhole portion of the facilities. It vests in IDNR the authority to regulate the downhole portion and requires IDNR to adopt rules establishing minimum safety standards for UNGS facilities. It requires IDNR to work cooperatively with the ICC to regulate intrastate pipeline facilities. It requires UNGS facility operators to file a plan for inspection and maintenance of the downhole facilities. It allows IDNR to review the plans and require revisions. It sets operating, reporting and recordkeeping requirements. It allows for penalties for violations of the Act. It creates a process for the issuance of notices of proposed violations. It also amends the Illinois Gas Pipeline Safety Act to reflect the jurisdictional changes to the ICC and IDNR's authority.

The new Illinois Underground Natural Gas Storage Safety Act allows IDNR to apply for PHMSA certification under 49 USC 60105. This will allow IDNR to become a full partner with PHMSA, meaning that IDNR can draft and adopt rules more stringent than the minimum federal safety standards and undertake their own enforcement actions. Currently, IDNR is performing inspections for PHMSA under an agreement entered into under 49 USC 60106. The 60106 agreement does not allow IDNR to adopt rules or perform their own enforcement. IDNR can merely perform inspections under the minimum federal safety standards and refer any potential enforcement to PHMSA.

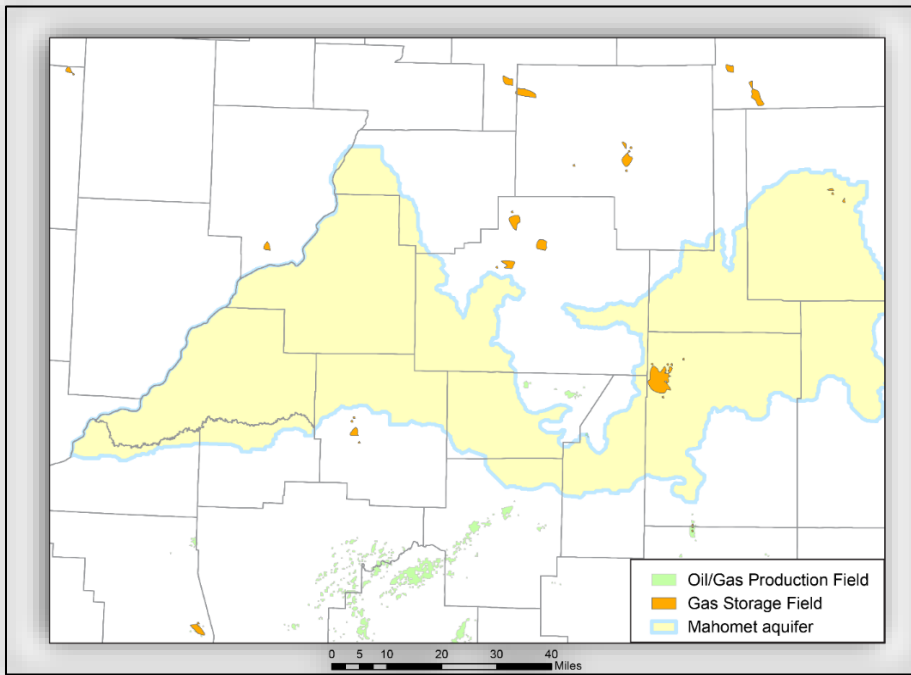


FIGURE 10: NATURAL GAS STORAGE FIELDS AND OIL/GAS PRODUCTION FIELDS IN RELATION TO THE MAHOMET AQUIFER SOLE-SOURCE AQUIFER BOUNDARY. (PRAIRIE RESEARCH INSTITUTE, 2018)

III. Actions that Might be Taken to Ensure the Long-term Protection of the Mahomet Aquifer

A. Actions Targeted at Identified Threats

As discussed in the previous section, Subcommittee A worked to define the various threats to water quality of the Mahomet Aquifer. From that list of threats, Subcommittee B identified the actions that might be taken to ensure the long-term protection of the Mahomet Aquifer. The following are the recommendations generated by Subcommittee B for each of the threats identified.

Abandoned wells

- Promote well sealing demonstrations and communicate importance to homeowners.
- Provide resources to better track and keep records of well sealings.
- Develop online reporting tools for well permitting, drilling, and sealing.

Legacy Landfills

- Conduct a pilot at the Pekin landfill to establish a trust fund for obtaining certified closure. Use the techniques recommended to evaluate pre-Part 807 landfills in areas with a high potential for aquifer recharge.
- Use the detailed terrain model templates to conduct an inspector training module for using the detailed terrain model templates and to instruct staff on how to annotate these images with defects such as depressions, erosion, landslides, barren areas, leachate seeps, trees, and vegetation anomalies.

Nitrate

- Continue to raise awareness of the NLRs and implementation efforts in existence to improve water quality and reduce nutrient loss into Illinois waterways.
- Continue to fund scientific research of agricultural BMPs and wastewater treatment plant technology that can continue to reduce nutrient loss into Illinois waterways and groundwater.
- Expand cost-share opportunities to farmers to encourage adoption of BMPs that add expense and risk to farming operations.
- Centralize the nitrate concentration data collected by the county public health departments.
- Review nitrate data to determine the location, depth, and construction of wells vulnerable to nitrate contamination.
- Develop recommendations to avoid high-nitrate zones when constructing new wells.
- Discourage the use of shallow sand points.
- Promote the public health guidelines to private well owners concerning setbacks for septic systems, feedlots, and other sources of nitrate.

Arsenic

- Encourage private well owners to test their water for arsenic.
- Conduct scientific studies to better understand the distribution of arsenic in the aquifer.
- Promote low-cost water treatment technology.

Road Salt

- Expand road salt education and training programs, like those organized by the Tazewell County Health Department, to all the counties over the aquifer.
- Encourage municipalities and counties to calibrate their road salt spreaders.
- Monitor chloride trends in public water supply wells.

Source Water Susceptible to Contamination

- Develop source water protection plans pursuant to 35 Ill. Adm. Code 604 Subpart C, after the effective date of adoption, for the CWS determined to be susceptible to groundwater contamination.
- Implement measures identified in the source water protection plans to protect groundwater using existing authorities (e.g., maximum setback zones, overlay zoning ordinances, pollution prevention, best management practices, regulated recharge areas, local government ordinances, etc.). More information on these authorities is available on the Task Force website.

- Closely monitor well drilling and well abandonment (potential routes of groundwater contamination) in areas with adopted ordinances or environmental land-use covenants that prohibit new potable well drilling in areas where risk-based remediation has occurred.

HHW and PCPP

- Consider implementing some of the measures included in the final report from the Illinois Task Force on the Advancement of Materials Recycling.

Underground Natural Gas Storage

- The General Assembly should incorporate federal law and regulation for underground natural gas storage into state law and empower IDNR to implement that law.
- Establish a trust fund to cover the cost of remediation in the event of a significant environmental incident so immediate remediation can begin.
- Require companies storing natural gas underground to consult with third-party environmental experts in the event of a significant environmental incident to certify their corrective plans and conduct oversight of the cleanup.

B. Generally Applicable Recommendations

The Task Force developed recommendations based on input from Subcommittee A and used the process detailed in Section II and Appendices A and B. In addition, the Task Force used published stakeholder recommendations on delineating and assessing the Mahomet Aquifer system that were compiled by the Prairie Research Institute (PRI)⁶. Then Subcommittee B developed a spreadsheet using the compiled stakeholder recommendations and the worksheets to facilitate a straw poll among the full Task Force members. This instrument was then used to pick the top 10 recommendations. Table 1 provides the final tally and ranking of recommendations.

⁶ *Recommendations for Research, Management, and Protection of the Mahomet Aquifer* compiled by the Prairie Research Institute, June 2018.

<http://www.prairie.illinois.edu/sites/prairie/files/comms/Recommendations%20on%20Research%2C%20Management%2C%20and%20Protection%20of%20the%20Mahomet%20Aquifer%20%281%29.pdf>

TABLE 1: RANKING BY SUBCOMMITTEE B OF EXISTING MAHOMET AQUIFER RECOMMENDATIONS.

Rank	Recommendation	Total Points
1	UNDERSTANDING THE RESOURCE: Geophysical (HTEM) studies	160
2	UNDERSTANDING THE RESOURCE: Recharge area identification	128
3	UNDERSTANDING THE RESOURCE: Groundwater flow modelling	93
4	WATER QUALITY AND PROTECTION: Implement source water protection plans	82
5	WATER QUALITY AND PROTECTION: Ambient water quality assessment	58
6	COMMUNICATION: Improve education and outreach about water resources	54
7	WATER QUANTITY AND SUSTAINABILITY: Empower a group to provide leadership	45
8	COMMUNICATION: Plan cooperative research and data collection	38
9	WATER QUANTITY AND SUSTAINABILITY: Update regional water supply plans	36
10	WATER QUANTITY AND SUSTAINABILITY: Ensure comprehensive use reporting	33
11	WATER QUANTITY AND SUSTAINABILITY: Assess the impact of high-capacity wells	25
12	COMMUNICATION: Provide education to private water and gas well owners	25
13	WATER QUALITY AND PROTECTION: Improve identification of contamination	22
14	WATER QUANTITY AND SUSTAINABILITY: Identify keys for water planning	18
15	WATER QUANTITY AND SUSTAINABILITY: Eco-friendly water infrastructure	11
16	WATER QUANTITY AND SUSTAINABILITY: Promote water conservation measures	7
17	WATER QUANTITY AND SUSTAINABILITY: Develop local water supply plans	4
18	WATER QUANTITY AND SUSTAINABILITY: Encourage drought preparedness.	3

The Task Force also recommends the General Assembly consider the following generally applicable actions for the future protection of the Mahomet Aquifer.

[Aquifer Characterization](#)

A wide range of new technological methods are available that enable scientists to identify and map the details of aquifers, and consequently, to determine and describe the availability of groundwater supplies. One such technology is helicopter-based time-domain electromagnetics (HTEM), which has been described as a “game changer for hydrogeology.” HTEM methods are used to measure the

electrical properties of the subsurface geological materials, which can be interpreted to map and characterize aquifer systems to depths of more than 1,500 feet. HTEM technology gathers a much higher density of data than ground-based geophysics or invasive research methods such as drilling, and the airborne method allows for rapid, continuous collection of data. The HTEM system consists of a transmitter and a receiver suspended from a helicopter and flown over a mapping area. HTEM data can be processed to generate 3-D images and depth slices of the subsurface electrical conductivity. HTEM technology is crucial for geologic mapping because it fills in data gaps that are not observed by typical land-based technologies such as geologic test hole drilling.

The Task Force recommends the General Assembly provide \$19.8 million to PRI to use HTEM technology to characterize the aquifer to aid in identifying the connections with other aquifers and surface waters. Work could potentially be done in phases to focus on areas of highest interest first. For example, Area 2 (approximately \$4 million) incorporates both the threat from the natural gas storage field and the critical recharge areas for the Champaign-Urbana water supply. Area 5 (approximately \$3.3 million) covers the transitional areas where there is a higher geologic susceptibility to contamination because the natural protective clays layers over the aquifer are thin or absent.

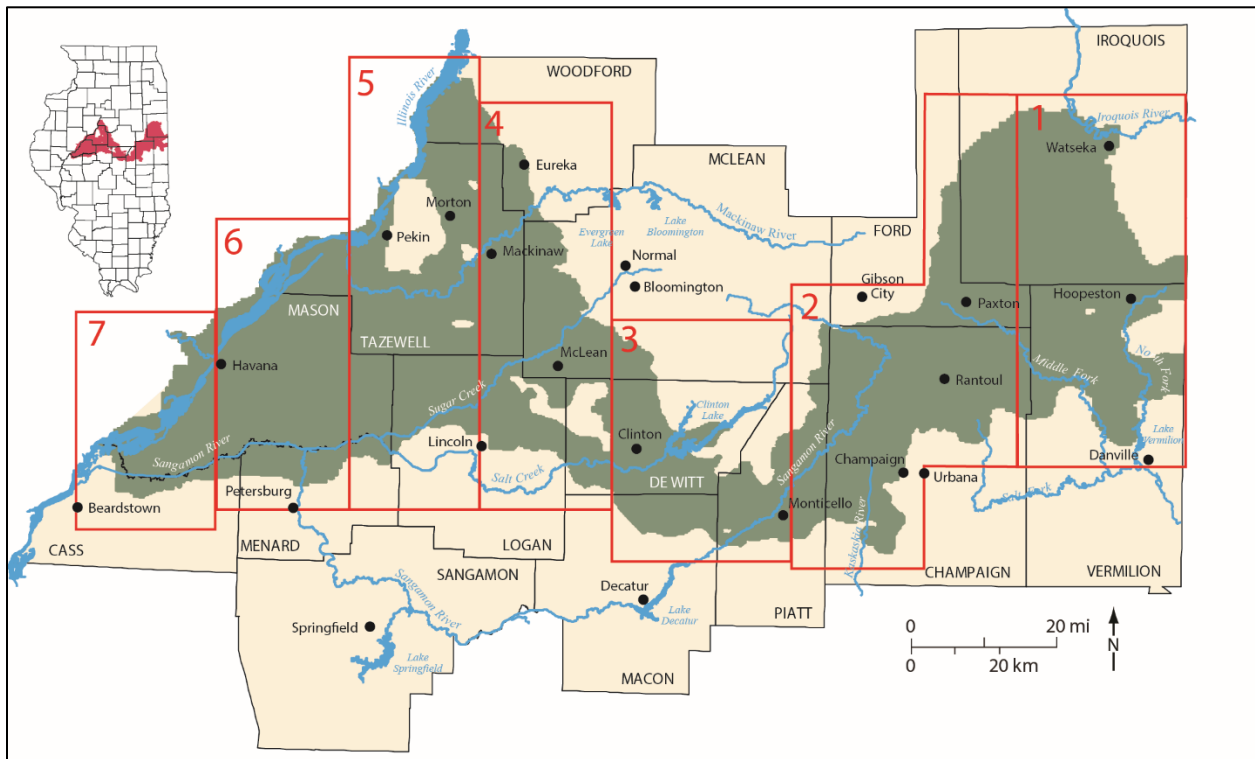


FIGURE 11: SEVEN PROVISIONAL "ZONES" DEFINING PROSPECTIVE HTEM ANALYSIS OF THE MAHOMET AQUIFER. THIS MAP WAS ORIGINALLY PREPARED FOR AN ISGS REPORT ON THE FUTURE OF SCIENCE OF THE MAHOMET AQUIFER⁷ BUT THE AREA OF ZONE 2 WAS MODIFIED AT THE REQUEST OF THE TASK FORCE. (PRAIRIE RESEARCH INSTITUTE, 2018)

⁷ Brown, S.E., J.F. Thomason, and K.E. Mwakanyamale, 2018, The future of science of the Mahomet aquifer: Champaign, Illinois State Geological Survey, Circular 594, 25 p. <http://hdl.handle.net/2142/99079>

The state's investment in HTEM technology will better define surface water and groundwater conditions. The Task Force recommends that results be integrated into next-generation groundwater flow models.

Communication

The Task Force recommends that the General Assembly improve education and outreach regarding the Mahomet Aquifer such that all stakeholders are better informed about water resources, water demand, and water supply planning and management, particularly when plans are made, reviewed, and updated.

The Task Force recommends the General Assembly plan cooperative research and data collection, analysis, management, and exchange by academic institutions, units of government, the private sector, and other stakeholders.

Water Quality and Protection

The Task Force recommends the General Assembly expand the critical data collection and research efforts of PRI by providing \$2.3 million per year in additional general revenue funds. An additional one-time request of \$1.0 million will provide funding for the necessary equipment to deploy state-of-the-art monitoring networks and to create the analytical capability to identify emerging contaminants of concern. These new efforts will address recommendations outlined in the categories of Aquifer Characterization, Water Quality and Protection, Water Quantity and Sustainability, and Communication, and many of the threats and potential threats identified by the Task Force in Section III.A. Highlights of this new focus on the Mahomet Aquifer include the creation of more comprehensive monitoring networks for groundwater levels, surface water flows, and atmospheric variables; modernization of well databases; improvement of online access to information for the public; development of next-generation groundwater flow models; water quality studies with specific emphasis on the fate and transport of nitrate between the aquifers and streams; and technical assistance outreach to communities and stakeholders.

The Task Force recommends that water quality be improved by implementing the recommendations in Section III.A.

Water Quantity and Sustainability

The Task Force recommends the General Assembly develop a group with a mission similar to the Mahomet Aquifer Protection Task Force that is a blend of other select individuals that serve in a quasi-government or government capacity to provide leadership administrative stature or process for regional water supply.

The Task Force recommends the General Assembly use the established water supply planning process to review and update regional and local water supply plans at least every five years. The IDNR Office of Water Resources (OWR) is the lead agency with respect to water supply planning. IDNR's authority, role, and State Water Supply Action Plan are detailed in Appendix B.

The Task Force recommends the General Assembly consistently and fully fund the Illinois Water Inventory Program.

Underground Natural Gas Storage

The Task Force recommends the General Assembly incorporate federal law and regulation for underground natural gas storage into state law and empower IDNR to implement that law.

Legacy Landfills

The Task Force recommends the General Assembly consider methods for obtaining certified closure of legacy landfills. The Task Force suggests that a pilot be conducted at the Pekin landfill to establish a trust fund for obtaining the certified closure.

IV. Legislative Recommendations for the Future Protection of the Mahomet Aquifer

Given the above described findings and recommendations, the Task Force makes the following legislative recommendations for the future protection of the Mahomet Aquifer.

First, the Task Force recommends the General Assembly provide \$19.8 million to PRI to use HTEM technology to characterize the aquifer to aid in identifying the connections with other aquifers and surface waters.

Second, the Task Force recommends the General Assembly incorporate federal law and regulation for underground natural gas storage into state law and empower IDNR to implement that law; that it establish a trust fund to cover the cost of remediation in the event of a significant environmental incident so immediate remediation can begin; and that it require companies storing natural gas underground to consult with third-party environmental experts in the event of a significant environmental incident to certify their corrective plans and conduct oversight of the cleanup.

Third, the Task Force recommends that the General Assembly provide one-time funding of \$1 million and an annual funding increase of \$2.3 million to PRI to deploy state-of-the-art water quality monitoring networks and to create the analytical capability to identify emerging contaminants of concern.

V. Topics Suggested for Future Review

There were a number of issues that emerged during the Task Force's study and deliberations that the Task Force lacked sufficient time to comprehensively consider. The Task Force recommends that the General Assembly develop a group with a mission similar to the Mahomet Aquifer Protection Task Force that is a blend of other select individuals that serve in a quasi-government or government capacity to provide leadership administrative stature or process for regional water supply. The following are suggested as potential topics for consideration by this future group:

- the potential effects of windmills on groundwater.
- the permitting process for landfills with respect to the local siting requirements and public notice, particularly regarding the type of material to be landfilled. (See recent ruling by the Illinois 4th District Appellate Court in the case Illinois Environmental Protection Agency v. The Illinois Pollution Control Board and Brickyard Disposal & Recycling, Inc. <http://www.illinoiscourts.gov/Opinions/AppellateCourt/2018/4thDistrict/4170144.pdf>).

- The relevance of HTEM as part of landfill siting decisions, particularly for radioactive or hazardous substances.
- Threats posed by past industrial processes, such as unrecorded releases of by-products and hazardous materials or past disposal of by-products and hazardous materials by now-prohibited means. The historical wastes may be a source of surface or groundwater contamination particularly if above shallow aquifers or a recharge area.

VII. Conclusion

The protection of the quality and quantity of the Mahomet Aquifer is the responsibility of everyone, from citizens to cities and from counties to state agencies.

Appendix A: Resources on the Mahomet Aquifer Protection Task Force Website

To help support the Task Force in its effort to protect the Mahomet Aquifer system, the Illinois EPA developed a Task Force webpage: <https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-force/Pages/default.aspx>. This webpage contains all the meeting agendas, minutes, and presentations.

Presentations

- Mahomet Aquifer Groundwater Protection Task Force – Groundwater Assessment and Protection Tools, Rick Cobb, Illinois EPA
- Protection of the Mahomet Aquifer, George Roadcap, PRI
- An Introduction to Natural Gas Storage in Illinois, Randy Locke, PRI
- The Future of Science of the Mahomet Aquifer, Jason Thomason, PRI
- Illinois EPA Investigation of the Thermogenic Natural Gas Release into the Mahomet Aquifer from the Manlove Natural Gas Storage Field, Rick Cobb, Illinois EPA
- Underground Natural Gas Storage Regulation in Illinois, Mike Mankowski, IDNR
- Illinois Legacy Landfills, and Implications for Mahomet Aquifer Groundwater Resources, Chris Stohr, Applied Geo-Imaging Solutions
- Mahomet Aquifer Task Force, Bill Compton, Chair Groundwater Advisory Council
- Subcommittee B's Working List of Recommendations by Category and Priority, Jim Risley
- What is Considered a Threat to Groundwater, Rick Cobb, Illinois EPA
- Threat Assessment of Select Mahomet Aquifer Landfills in Areas with a High Potential for Aquifer Recharge, Hayden King, Rick Cobb, Joe Konczyk, Jeff Turner, Jason Thorpe, Paul Eisenbrandt, and Ken Smith, Illinois EPA

The website also provides references for materials used by the Task Force to develop this report and to implement these recommendations.

References

- Mahomet Groundwater Systems
- Illinois EPA 2012 Integrated Water Quality Report: Illinois EPA has done a focused evaluation the CWS probabilistic network wells screened in the Mahomet Aquifer. Information related to this evaluation is found in our [2012 Integrated Water Quality Report - Volume II](#), specifically pages 39 - 49 and Figures C-8 and C-9 on pages 22 and 24, respectively.
- Illinois EPA's [Groundwater Quality Protection Program](#) webpage has links to program details and resources including the documents [Groundwater Protection by Local Governments](#) and [Guidance Document for Groundwater Protection Needs Assessment](#)
- [Illinois EPA Source Water Assessment Protection Program GIS Tool](#)
- [*"Meeting East-Central Illinois Water Needs to 2050: Potential Impacts on the Mahomet Aquifer and Surface Reservoirs"*](#)
- [The Mahomet Aquifer Consortium: "A Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois"](#)
- [Natural Gas Working group](#)

- ["Anomalous Groundwater Pressure Responses in the Mahomet Aquifer Near the Manlove Gas Storage Field"](#) - George Roadcap, Illinois State Water Survey, Prairie Research Institute
- [Geologic Cross Sections of Quaternary Deposits Across the Manlove Gas Storage Field Area, Champaign County, Illinois](#) - Andrew J. Stumpf, Illinois State Geological Survey, Prairie Research Institute
- [United States Geological Survey \(USGS\) Report, Tritium-analysis](#)
- [The People's Gas Light and Coke Company First Agreed Interim Order](#)
- Groundwater flow and recharge in the Mahomet Bedrock Valley Aquifer, east-central Illinois
- [Fact Sheet for Methane in Groundwater](#)

Example Groundwater Protection Ordinances

- The [Central Region Groundwater Protection Committee's](#) web page includes links to the [Tazewell County Groundwater Protection Ordinance](#) and the [City of Pekin's Overlay Wellhead Ordinance](#)

Videos

- [Video on 3-D mapping that includes 3D rendering of the Mahomet Aquifer](#): Barb Stiff, Illinois State Geological Survey
- [Video on Recharge Rates of the Mahomet Aquifer](#): George Roadcap, Illinois State Water Survey

Appendix B: Process and Responsibility for Protection of the Mahomet Aquifer

The protection of the quality of the Mahomet Aquifer is the responsibility of everyone, from citizens to cities and from counties to state agencies. Illinois EPA, the Illinois Pollution Control Board, and the Illinois Attorney General’s Office have broad powers to protect groundwater under the Illinois Groundwater Protection Act (IGPA) adopted in 1987 and the Illinois Environmental Protection Act (Act). Section 12(a) and (d) of the Act were adopted in 1970 and Part 620 (Groundwater Quality Standards Regulation) was adopted in 1991.

Illinois Environmental Protection Act

Sections 12(a) and (d) of the Act are extremely broad in scope. Section 12(a) prohibits any person from causing, threatening or allowing the “discharge of any contaminants . . . so as to cause or tend to cause water pollution in Illinois, either alone or in combination with matter from other sources, or so as to violate regulations or standards” adopted by the IPCB. The provision contains prospective language (e.g., “threaten,” “tend to cause”) such that a violation may occur.

Section 12(d) similarly incorporates the breadth of the definition of “water pollution” and has a prospective element. A “hazard” is a risk or peril, a possible source of danger. Based on the plain language, water pollution does not actually have to occur before the provision is violated.

Conducting activities that cause, threaten or allow the migration of contaminants in concentrations greater than naturally occurring concentrations brings the related activities within the purview of Section 12(a) depending on site-specific circumstances. Bringing soil with the potential to pollute groundwater in concentrations greater than naturally occurring concentrations to

Sec. 12. Actions prohibited. **No person shall:**
(a) Cause or threaten or allow the discharge of any contaminants into the environment in any State so as to cause or tend to cause water pollution in Illinois, either alone or in combination with matter from other sources, or so as to violate regulations or standards adopted by the Pollution Control Board under this Act.
(d) Deposit any contaminants upon the land in such place and manner so as to create a water pollution hazard.

Sec. 3.165. Contaminant. “Contaminant” is any solid, liquid, or gaseous matter, any odor, or any form of energy, from whatever source.

Sec. 3.545. Water pollution. “Water pollution” is such alteration of the physical, thermal, chemical, biological or radioactive properties of any waters of the State, or such discharge of any contaminant into any waters of the State, as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses, or to livestock, wild animals, birds, fish, or other aquatic life.

Sec. 3.550. Waters. “Waters” means all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this State.

locations for deposit upon the land brings the related activities within the purview of Section 12(d) depending on site-specific circumstances.

Illinois Groundwater Protection Act

In addition to the protections afforded by Section 12 (a) and (d) of the Act, the Mahomet Aquifer and all groundwater in Illinois is protected by the Illinois Groundwater Protection Act (415 ILCS 55/ et. seq.). Among its provisions establishing various mechanisms for ensuring the protection of groundwater, Section 8 of the Groundwater Protection Act mandates that the Agency “propose regulations establishing comprehensive water quality standards which are specifically for the protection of groundwater” and that the Board promulgate those standards into Illinois’ environmental regulations.

Board Regulations

Section 620.301 of the Board’s groundwater quality standards prohibits causing, threatening or allowing the release of any contaminant to a resource groundwater that would require treatment or additional treatment to continue an existing use or to assure a potential use or that would preclude an existing or potential use. The plain language is clear that the non-degradation provision can be violated before contamination reaches the numeric standard because: (1) The use threatened or precluded does not have to be a current use; it also may be a potential use even if it may take decades to materialize; and (2) diminishment of the resource affecting, among other factors, taste, odor, turbidity and phytotoxicity do not necessarily depend on violation of a numeric standard.

The effectiveness of Illinois EPA to carry out its responsibility depends on the level of planning and coordination with all the other groups and on how those other groups execute their responsibilities. In addition to the requirement described previously to adopt water quality standards, Section 4 of the IGPA established the Interagency Coordinating Committee on Groundwater (ICCG) and Section 5 of the

Illinois Groundwater Protection Act (415 ILCS 55/2) (from Ch. 111 1/2, par. 7452)

Sec. 2. (a) The General Assembly finds that:

- (i) a large portion of Illinois' citizens rely on groundwater for personal consumption, and industries use a significant amount of groundwater;
- (ii) contamination of Illinois groundwater will adversely impact the health and welfare of its citizens and adversely impact the economic viability of the State;
- (iii) contamination of Illinois' groundwater is occurring;
- (iv) protection of groundwater is a necessity for future economic development in this State.

(b) Therefore, 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 the general health, safety, and welfare. It is further recognized as consistent with this policy that the groundwater resources of the State be utilized for beneficial and legitimate purposes; that waste and degradation of the resources be prevented; and that the underground water resource be managed to allow for maximum benefit of the people of the State of Illinois.

IGPA established the Groundwater Advisory Council (GAC) in 1987. Further, Section 17.2 of the Act establishes regional groundwater protection planning programs, starting in 1991, in areas of the state with the highest potential for groundwater contamination. The job of all these different groups depends on where they fall in the six-stage process of aquifer protection and restoration, from planning to response, as outlined in the flow chart below. Two common themes throughout the process include the performance of data collection and scientific studies and the implementation of effective regulatory tools.

Myriad additional federal and state regulations also help to protect and restore groundwater and surface water, as follows:

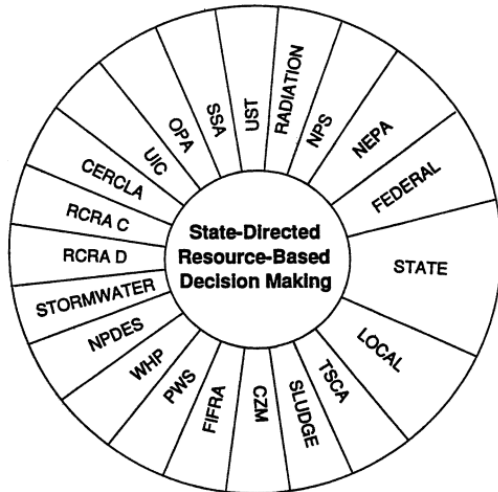
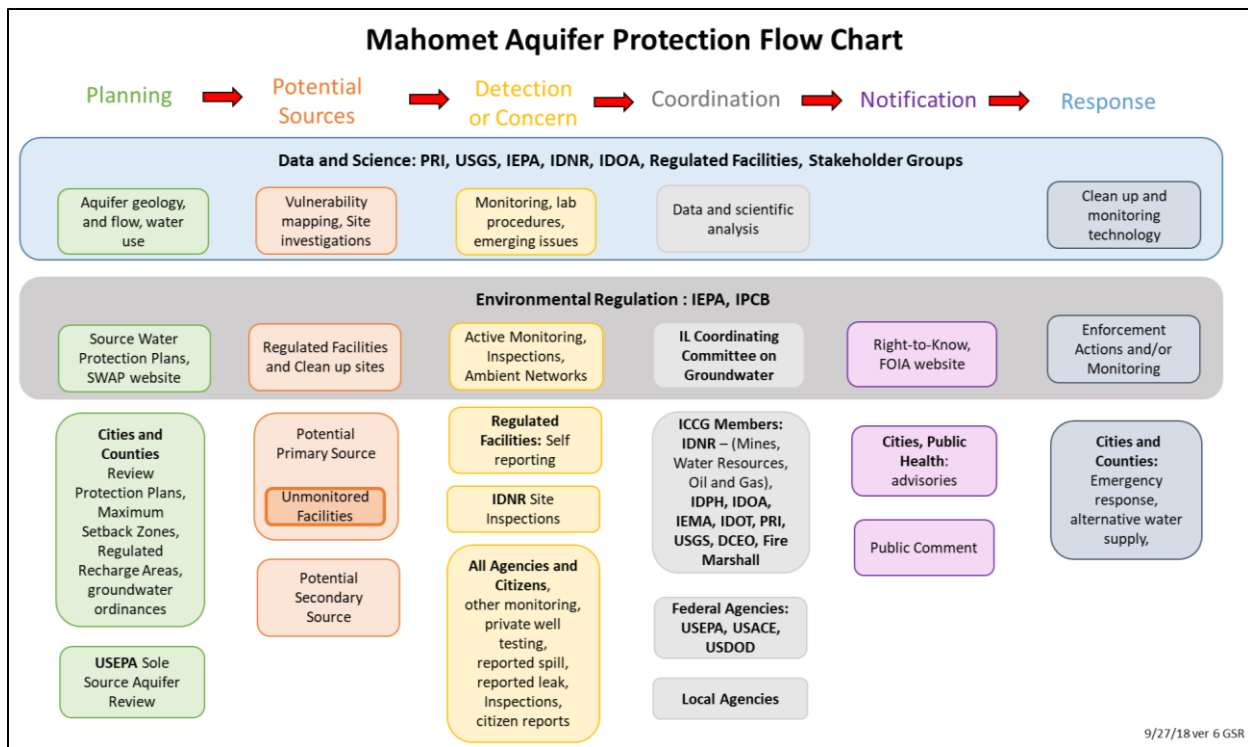


FIGURE 12: MYRIAD FEDERAL REGULATIONS THAT ALSO PROTECT GROUNDWATER

- Resource Conservation and Recovery Act (RCRA)
- Underground Storage Tanks (UST)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund)
- Federal Insecticide Fungicide and Rodenticide Act (FIFRA)
- Toxic Release Inventory; Underground Injection Control (UIC)
- Safe Drinking Water Act (SDWA)
- National Pollution Discharge Elimination System (NPDES)
- Wellhead Protection Program (WHPP)
- Section 319 Nonpoint Source Grants
- Emergency Planning and Community Right-to-Know Act (EPCRA).

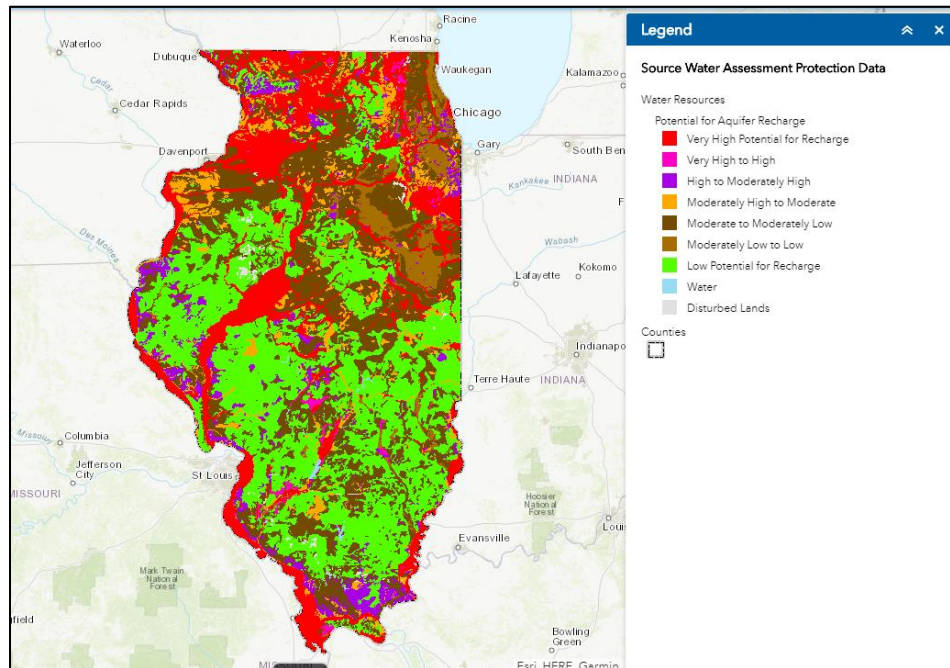
For further information on these regulations and how they are designed to protect or restore groundwater see <https://www.epa.gov/regulatory-information-topic>.



Protection of Public Water Supplies

Step #1 - Planning

Pursuant to Section 17.2 of the Act, the ISWS and ISGS developed *Illinois' Potential for Aquifer Recharge Map* to establish the priority groundwater protection planning regions. The Central Groundwater Protection Planning Region was established on the western end of the Mahomet Aquifer. As illustrated in the flowchart above, well site survey reports



were developed for every community water supply (CWS); concurrently these systems were being sampled starting in 1984 for volatile organic compounds (VOCs), pesticides, and inorganic compounds. Groundwater contamination hazards were assessed for the potential contamination sources identified

in the well site survey reports prepared by Illinois EPA. Groundwater contamination advisories were issued where potential contamination sources represented a significant threat to public health or the environment.

In addition, Sec. 17.1. (a) states that “Every county or municipality which is served by a community water supply well may prepare a groundwater protection needs assessment. The county or municipality shall provide notice to the Agency regarding the commencement of an assessment. Such assessment shall consist of the following at a minimum:

Regional Planning

The Illinois EPA was required to establish a regional groundwater protection planning program pursuant to Section 17.3 of the Act. Since 1991 the Illinois EPA, in cooperation with the Illinois Department of Natural Resources (IDNR), has designated four priority groundwater protection planning regions. These regional designations took into account the location of recharge areas that were identified and mapped by IDNR. Further, the director of Illinois EPA establishes a regional planning committee for each priority groundwater protection planning region. Each regional planning committee is responsible for the following:

- Identification of and advocacy for region-specific groundwater protection matters;
- Monitoring and reporting the progress made within the region regarding implementation of protection for groundwaters;
- Maintaining a registry of instances where the Agency has issued an advisory of groundwater contamination hazard within the region;
- Facilitating informational and educational activities relating to groundwater protection within the region; and
- Recommending to the Agency whether there is a need for regional protection pursuant to regulated recharge area.

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 over 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, considering the:
 - a. characteristics of such potential sources and potential routes,
 - b. the nature and efficacy of containment measures and devices in use,
 - c. the attenuative qualities of site soils in relation to the substances involved,
 - d. 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, some measure of groundwater protection; and

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.”

Illinois EPA conducted a pilot groundwater protection needs assessment for the City of Pekin located in the Central Groundwater Protection Planning Region in the Mahomet Aquifer. The Central Regional Committee worked with local stakeholders to develop a local groundwater protection team. This team developed the Pekin Wellhead Protection Overlay Zoning Ordinance.

Illinois EPA, ISWS, and ISGS developed a Guidance Document for Groundwater Protection Needs Assessments in 1995 to help provide technical assistance to counties and municipalities in the implementation of Section 17.1 of the Act. Further, the Education Subcommittee of the ICCG worked with the Department of Urban and Regional Planning at the University of Illinois at Urbana-Champaign to develop Groundwater Protection by Local Government in 1993, which is available on the Task Force website.

Step #2 - Identifying Potential Contamination Sources

Identifying potential sources has been done in various phases. Starting in 1984, the first statewide survey of VOCs and pesticides in CWS led to the *Plan for Protecting Illinois Groundwater* in 1985. In 1987, many of the elements of this plan were incorporated into Public Act 85-063, which formally codified statutory definitions for potential primary and secondary source of groundwater contamination and potential routes of groundwater contamination and led to the adoption of new technology controls (1991) for certain existing and new activities in setback zones and regulated recharge areas.

Sec. 3.390. Regulated recharge area. “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.

Well site surveys, hazard reviews, groundwater protection needs assessments, and source water assessments have all inventoried potential groundwater contamination sources and threats to contamination of groundwater.

Step #3 – Responding to New Threats and Concerns

Many of these potential sources of contamination inventoried have led to expanded setback zones around CWS wells using Part 671. For example, the Pilot Groundwater Protection Needs Assessment conducted for the Pleasant Valley Public Water District identified potential threats that did not have preventive programs. This led to the development of the Pleasant Valley regulated recharge area (Part 617) pursuant to Section 17.3 and 17.4 of the Act. Part 617 codified new potential source definitions based on smaller thresholds of hazardous substances (i.e. potential tertiary source) and developed new prevention-based requirements for the storage and handling of such substances within the delineated recharge area.

In addition, the ambient groundwater-monitoring network designed to represent the population of CWS wells is used for the outcome metric to measure groundwater quality on an annual basis. Over the years, this led to efforts of evaluating groundwater for new and emerging contaminants, such as radon, herbicide transformation products, chromium 6, and now per- and polyfluoroalkyl Substances (PFAS).

Step #4 – Coordination

The ICCG (chaired by Illinois EPA) comprises all the state agencies or departments that have some authority to regulate groundwater:

- Illinois Department of Public Health (IDPH)
- Illinois State Fire Marshall
- Office of Mines and Minerals
- Office of Water Resources
- Illinois Emergency Management Agency (Division of Nuclear Safety)
- Illinois Department of Transportation
- Illinois Department of Agriculture
- Illinois Department of Natural Resources
- Department of Commerce and Economic Opportunity

The ICCG has generally met quarterly since 1988 to:

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 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.
8. Report biennially to the Governor and the General Assembly on groundwater quality, quantity, and the state's enforcement efforts.

Illinois EPA proposes a groundwater protection regulatory agenda (e.g., Part 611 Subpart C, Part 671, Part 670, Part 620 and subsequent amendments, Part 615/616, Part 617, Part 618, proposed Part 841, Part 1010, and proposed Part 620 and new part 408) for consideration by the ICCG and the GAC. The principal purpose of the agenda is to systematically consider the groundwater protection aspects of relevant federal and state regulatory programs and to identify any areas where improvements may be warranted. To the extent feasible, the agenda also serves to facilitate a more uniform and coordinated approach toward protection of groundwaters in Illinois. Upon adoption of the final agenda by the ICCG, the chair of the ICCG assigns a lead agency and any support agencies to prepare a regulatory assessment report for each item on the agenda. Each regulatory assessment report shall specify the nature of the groundwater protection provisions being implemented and shall evaluate the results achieved therefrom. Special attention shall be given to any preventive measures being used for protection of groundwaters. After review and consideration by the committee, the reports shall become the basis for recommending further legislative or regulatory action.

Starting Jan. 1, 1992, the ICCG has provided a comprehensive status report to the Governor and the General Assembly concerning implementation of the IGPA. The groundwater quality outcome metric is used to evaluate program performance at protecting groundwater (output metric) to make recommendations to address issues. The ICCG also considers findings and recommendations that are provided by the GAC.

The GAC is composed of nine public members appointed by the Governor, including two persons representing environmental interests, two persons representing industrial and commercial interests, one person representing agricultural interests, one person representing local government interests, one person representing a regional planning agency, one person representing public water supplies, and one person representing the water well driller industry.

The GAC is tasked with the following:

- review, evaluate and make recommendations regarding state laws, regulations, and procedures that relate to groundwater protection;
- review, evaluate and make recommendations regarding the state's efforts to implement the IGPA and to generally protect the groundwater of the state;
- make recommendations relating to the state's needs for groundwater research; and
- review, evaluate and make recommendations regarding groundwater data collection and analyses.

Generally, the GAC has been meeting quarterly with the ICCG since 1988.

Step #5 – Notification

Public notification concerning threats of groundwater contamination has evolved over the years like other environmental regulations.

- **Advisory of Groundwater Contamination Hazard:** Illinois EPA can issue a groundwater contamination hazard to a county or municipality that has not prepared a groundwater protection needs assessment where Illinois EPA has conducted a well site survey under Section 17.1(g) of the Act. Such advisories are issued where the Illinois EPA 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 publishes a 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.
- **Well Centric Right-to-Know Notification (RTK):** Notification is triggered by detection of VOCs in a CWS well. An evaluation of the threat to potential nearby potable water supply wells (i.e. private, semi-private wells) is conducted, and a press release is drafted with IDPH encouraging well owners to sample their wells for VOCs.
- **Site Centric RTK Notification:** An Illinois EPA Contaminant Evaluation Group (CEG) is convened by the Illinois EPA RTK coordinator to discuss sites that represent a threat to off-site soil and groundwater. Notification of off-site well users and community relations plans are implemented.

- **Community Water Supply Consumers RTK Notification:** If there is a detection of a contaminant with a Class I groundwater quality standard, every consumer is notified within five business days.

Step #6 – Response

Reponses to violations of the Act and Part 620 can be addressed via the voluntary cleanup program under Part 740. Alternatively, if Illinois EPA issues a violation notice (VN) for exceedance of a groundwater quality standard either we already have a hydrogeologic analysis that would assess causing, threatening, or allowing off-site contamination or we would require such an assessment as part of a groundwater management zone (GMZ) approval under Part 620.

Groundwater restoration under a GMZ is either approved voluntarily or as part of a consent, Board, or court order. The GMZ must be approved by the Illinois EPA. The Illinois Attorney General’s Office represents Illinois EPA in enforcement matters referred to them.

Groundwater restoration and cleanup is also conducted via RCRA corrective action requirements, under the voluntary site remediation program, Leaking Underground Storage Tank program, or under the federal Superfund program. For further detail, see the Illinois EPA Bureau of Land’s website: <https://www2.illinois.gov/epa/topics/waste-management/Pages/default.aspx>.

Emergency Response

The Emergency Operations Unit (EOU), within the Office of Emergency response, coordinates Illinois EPA’s response to environmental emergencies involving oil or hazardous materials and ensures that any environmental contamination is cleaned up. EOU works with other response agencies, including the Illinois Emergency Management Agency (IEMA), which is the initial contact for responses to an emergency or disaster in Illinois.

OER responsibilities include:

- Oil and hazardous material spills in water or on land
- Releases of harmful quantities of toxic substances into the air
- Emergencies involving wastewater treatment systems and public water supplies
- Emergencies involving solid waste disposal sites
- Fish kills caused by pollutants
- Abandoned hazardous waste incidents posing immediate hazards
- Illegal burning of waste

In case of an emergency call:

- **Illinois Emergency Management Agency** — (217) 782-7860 or (800) 782-7860 (in Illinois)
[Emergency Release Notification Fact Sheet](#)
- **National Response Center** — (800) 424-8802
- **Illinois Environmental Protection Agency** (if the emergency involves the release of potentially hazardous materials to the environment) — (217) 782-3637

Where are EOU personnel?

Most EOU personnel are in the Springfield Illinois EPA headquarters and can be reached at 217-782-3637. There are additional staff in the Collinsville (618-346-5120) and DesPlaines (800-759-7626)

Regional Offices. During evenings, weekends, and holidays, a 24-hour duty officer may be reached at 217-782-7860.

What assistance is available?

The EOU provides many services to other agencies and the public. The EOU may provide assistance in the form of:

- Technical information about identification, chemical properties, toxicity and potential dangers of a given hazardous material
- Monitoring or testing of air, water, soil, or containers
- Advice about:
 - Containment of hazardous materials
 - Restoration of the environment, including cleanup objectives
 - Evacuation recommendations
 - Disposal or treatment of hazardous materials
- Oversight to assure completeness of cleanup actions taken by responsible parties
- Documenting violations of the Illinois Environmental Protection Act for possible legal action
- Professional personnel, technical assistance, and equipment to assist public safety officials

What assistance is not provided?

The EOU generally does not lend assistance or assume a backup role in the following situations:

- Emergencies involving radioactive materials are handled by IEMA
- Emergencies involving disease-contaminated materials are handled by IDPH
- Spills at crude oil storage sites are handled by the Division of Mines and Minerals (part of IDNR), unless spills enter surface waters
- Citizens' pollution complaints are typically handled by the Illinois EPA Regional Offices and may be placed online
- Workplace chemical exposure is handled by the Illinois Department of Labor or the Occupational Safety and Health Agency

Regional Water Supply Planning IDNR Office of Water Resources

The General Assembly has authorized IDNR (20 ILCS 801/5-10) to:

- Study and investigate ways and means by which the various water uses may be coordinated to the end that the water resources of the state be put to their maximum beneficial use and, in connection therewith, to request any department or agency of the state to make surveys, studies, investigations, prepare plans, reports, and furnish such data and information as may be necessary.
- Coordinate, determine and provide ways and means for the equitable reconciliation and adjustment of the various conflicting claims and rights to water by users or uses.
- Recommend legislation for the most feasible method or methods of conserving water resources and putting them to the maximum possible use, taking into account the problems of navigation, flood control, river flow control and stabilization, reclamation, drainage and recapture, and further their utilization of water after use for any purpose, domestic and industrial use,

irrigation of land, municipal use, development of electric energy, public health, recreation, fish and game life, and other beneficial use.

Droughts and reoccurring concerns caused by growing water supply demand and conflicts across the state led to the Governor's Office issuance of Executive Order 2006-01⁸, which required the IDNR Office of Water Resources, in coordination with the Illinois State Water Survey, to:

1. Define a comprehensive program for state and regional water supply planning and management and develop a strategic plan for its implementation consistent with existing laws, regulations and property rights;
2. Provide for public review of the draft strategic plan for a water supply planning and management program;
3. Establish a scientific basis and an administrative framework for implementing state and regional water supply planning and management;
4. Develop a package of financial and technical support for, and encouragement of, locally based regional water supply planning committees. These committees, whether existing or new entities, shall be organized for participation in the development and approval of regional plans in the Priority Water Quantity Planning Areas;
5. By Dec. 31, 2006, ensure that Regional Water Quantity Plans are in process for at least two Priority Water Quantity Planning Areas.

A Strategic Plan for Implementation of Statewide Water Supply Planning was developed in 2008 in response to Illinois Executive Order 2006-01. The plan has been used to facilitate the development of three regional water supply plans. For more information, see <https://www.isws.illinois.edu/illinois-water-supply-planning>.

⁸ Governor's Executive Order 2006-01: Executive Order for the Development of State and Regional Water-Supply Plans. Issued by Governor's Office on Jan. 9, 2006.

Appendix C: Process of Identifying Potential Sources of Groundwater Contamination and Developing a Regulatory Agenda for Protection with the Interagency Coordination Committee on Groundwater and the Groundwater Advisory Council

The identification of contamination sources to any aquifer has been a developing scientific and regulatory process that is commonly believed to have started in 1854 with the discovery of a cholera outbreak directly tied to a contaminated public well in London.

For Illinois, the Illinois EPA has developed a list of potential sources (Table 2) based on experiences of the staff involved in cleaning up contamination sites and in the mapping and evaluation of protection zones around public water supply wells and intakes and ambient monitoring. New threats are constantly being evaluated and existing potential sources are being re-evaluated as technology improves. The term “threat” is often used in Illinois law and regulations when a potential source is an actual source of contamination that is threatening public health or the environment.

TABLE 2. MOST PREVALENT POTENTIAL SOURCES OF GROUNDWATER CONTAMINATION⁹ LISTED IN THE ILLINOIS INTEGRATED WATER QUALITY REPORT (ILLINOIS EPA, 2016). CONTAMINANTS: A=INORGANIC PESTICIDES; B=ORGANIC PESTICIDES; C=HALOGENATED SOLVENTS; D=PETROLEUM COMPOUNDS; E=NITRATE; F=FLUORIDE; G=SALINITY/BRINE; H=METALS; I=RADIONUCLIDES; J=BACTERIA; K=PROTOZOA; L=VIRUSES; M=OTHER.

Contaminant Sources	Occurrence of Potential ¹⁰ Sources	Contaminants
Agricultural chemical facilities	587	A, B, E
Animal feedlots	66	E, J, K, L
Drainage wells	3	A, B, C, D
Fertilizer applications	323	A, B, E
Irrigation practices	63	A, B, E
Pesticide applications	174	A, B, E
Land application	14	A, B, D, E, G, H, J
Material stockpiles	683	G, H
Storage tanks (above ground)	2,249	C, D
Storage tanks (underground)	2,878	C, D
Surface impoundments	236	E, G, H, J, K, L
Waste piles	231	E, G, H
Waste tailings	9	G, H, I, J
Deep injection wells	9	A, B, C, D, E, F, G, H, I, M
Landfills	40	C, D, G, H, J
Septic systems	6,290	E, G, H, J, K, L
Shallow injection wells	9	A, B, C, D, E, F, G, H, J, K, L
Hazardous waste generators	-	A, B, C, D, G, H
Hazardous waste sites	97	A, B, C, D, G, H
Industrial facilities	1,565	A, B, C, D, G, H
Material transfer operations	232	A, B, C, D, E, F, G, H
Mining and mine drainage	19	G, H, M
Pipelines and sewer lines	111	C, D, E, G, H, J, K, L
Salt storage and road salting	76	G
Salt water intrusion	-	G
Spills	9	A, B, C, D, E, G, J
Transportation of materials	164	A, B, C, D, E
Manufacturing/repair shops	1,554	C, D, G, H
Urban runoff	1,184	A, B, D, E, G, H, J, K, L
Potential routes of contamination such as drainage wells, improperly abandoned potable water wells, or sand & gravel quarries.	249	A, B, D, E, J, K, L
Former storage facility	113	A, B, C, D, E, G, H
Commercial waste or chemical handling facility	1,078	C, D, E, G, J
Public utilities facility	203	E, F, G, H, J, K, L
Waste treatment facility	202	E, G, H, J, K, L
Recreational facility	581	J, L
Agriculture materials storage and sales	-	A, B, E, G, M

⁹ The basis for the analysis is a combination of monitoring data and potential source of groundwater contamination data from the completed CWS well site survey reports that Illinois EPA has conducted over the past 25 years.

¹⁰ Occurrences are based solely on the Illinois EPA Groundwater Section's databases. This is only an estimate and should not be used as anything more than an approximation of potential sources of contamination to CWS wells in Illinois.

The Illinois EPA divides the potential sources into five broad categories and has mapped them around CWS wells in Illinois. The most frequently occurring potential sources include storage tanks, septic systems, industrial facilities, repair facilities, chemical handling facilities, and urban runoff sites. This list includes specific sites that are considered “point” potential sources, such as landfills; more widespread activities that are considered “non-point,” such as road salt or fertilizer application; and sources that may be one-time events, such as a highway spill or a pipeline break. The type of contaminants associated with each potential source can vary from materials that are considered carcinogenic at very low, parts-per-billion concentrations to naturally occurring compounds that are harmful in higher, parts-

Sec. 3.345. Potential primary source. *“Potential primary source” means any unit at a facility or site not currently subject to a removal or remedial action which:*

- (1) is utilized for the treatment, storage, or disposal of any hazardous or special waste not generated at the site; or*
- (2) is utilized for the disposal of municipal waste not generated at the site, other than landscape waste and construction and demolition debris; or*
- (3) is utilized for the landfilling, land treating, surface impounding or piling of any hazardous or special waste that is generated on the site or at other sites owned, controlled or operated by the same person; or*
- (4) stores or accumulates at any time more than 75,000 pounds above ground, or more than 7,500 pounds below ground, of any hazardous substances.*

Sec. 3.355. Potential secondary source. *“Potential secondary source” means any unit at a facility or a site not currently subject to a removal or remedial action, other than a potential primary source, which:*

- (1) is utilized for the landfilling, land treating, or surface impounding of waste that is generated on the site or at other sites owned, controlled or operated by the same person, other than livestock and landscape waste, and construction and demolition debris; or*
- (2) stores or accumulates at any time more than 25,000 but not more than 75,000 pounds above ground, or more than 2,500 but not more than 7,500 pounds below ground, of any hazardous substances; or*
- (3) stores or accumulates at any time more than 25,000 gallons above ground, or more than 500 gallons below ground, of petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance; or*
- (4) stores or accumulates pesticides, fertilizers, or road oils for purposes of commercial application or for distribution to retail sales outlets; or*
- (5) stores or accumulates at any time more than 50,000 pounds of any de-icing agent; or*
- (6) is utilized for handling livestock waste or for treating domestic wastewaters other than private sewage disposal systems as defined in the “Private Sewage Disposal Licensing Act.”*

Sec. 3.350. Potential route. *“Potential route” means abandoned and improperly plugged wells of all kinds, drainage wells, all injection wells, including closed loop heat pump wells, and any excavation for the discovery, development or production of stone, sand or gravel. This term does not include closed loop heat pump wells using USP food grade propylene glycol.*

per-million concentrations. Potential routes of aquifer contamination that can bypass any naturally occurring protective layers are also listed in Table 2, such as drainage wells, abandoned wells, or quarries.

The Act prioritizes potential sources of groundwater contamination as either primary or secondary and generally apply to facilities that landfill, store, or accumulate wastes or hazardous materials.

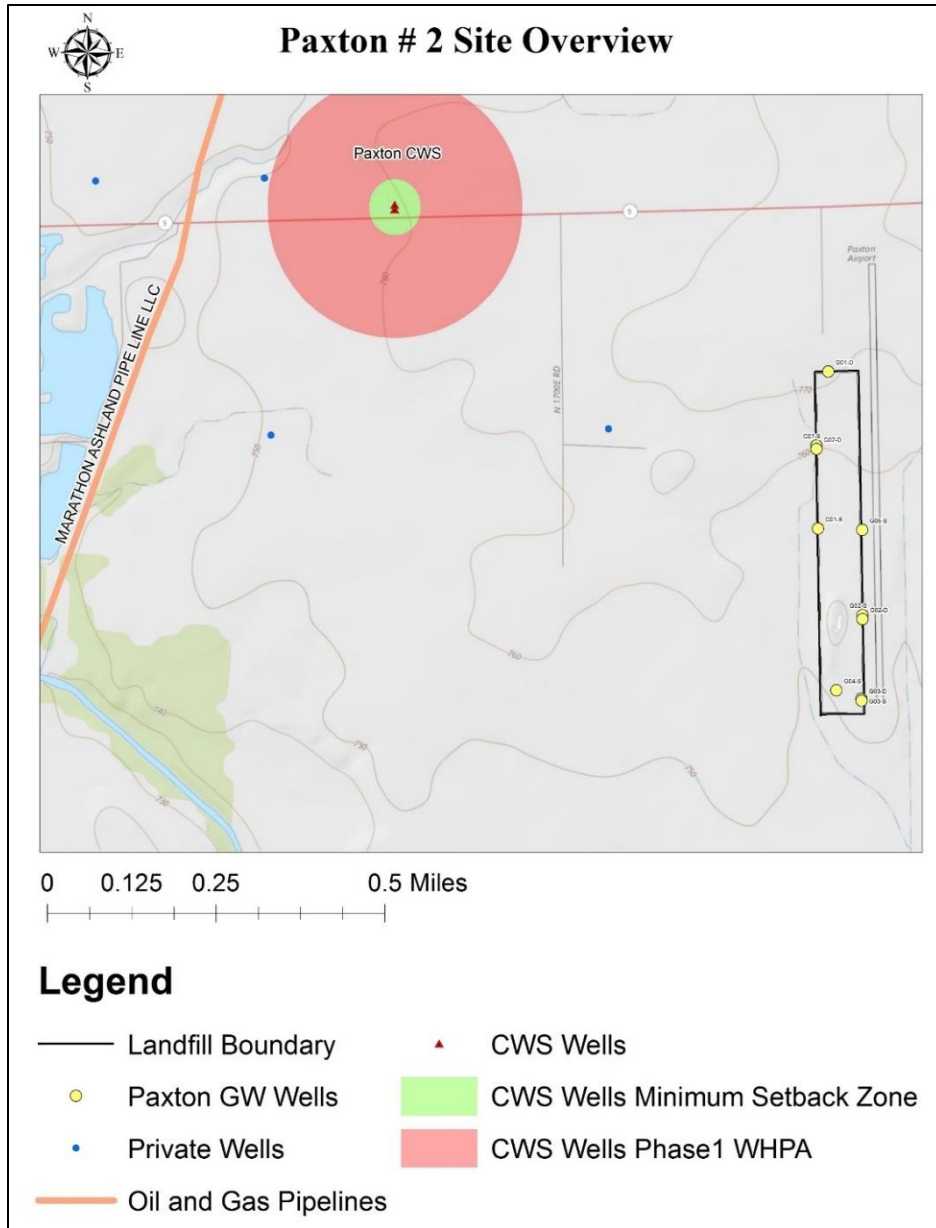
Information on most, if not all, of these facilities is on Illinois EPA's website within the Source Water Protection page or the Freedom of Information Act page. Additional information can also be found online in the quarterly reports of the Illinois Pollution Control Board (IPCB).

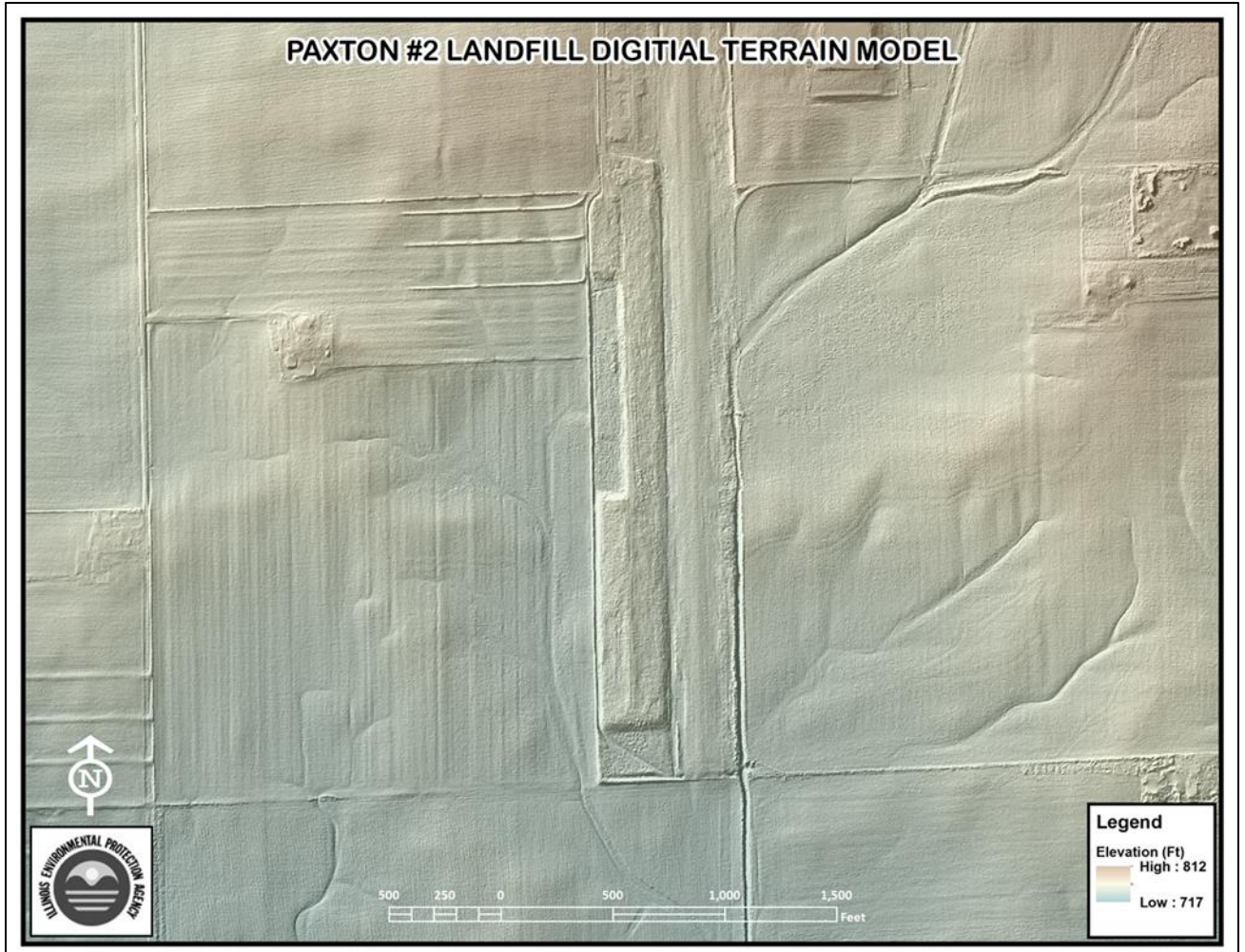
The regulations that apply to many of the facilities considered to be primary and secondary potential sources are well developed and allow for inspections and modifications. See also Appendix B, which describes existing laws, rules, and regulations that protect the Mahomet Aquifer and all groundwater in Illinois. Thus, the Task Force did not focus on these sources. Instead, the Task Force focused on those potential sources that are less tangible or more difficult to address, such as non-point sources, natural contaminants, or uninvestigated legacy facilities.

Appendix D: Summary of Illinois EPA Reviews of Five Part 807 Landfills in Areas with Moderate to High Potential for Aquifer Recharge

Paxton #2 (Ford County)

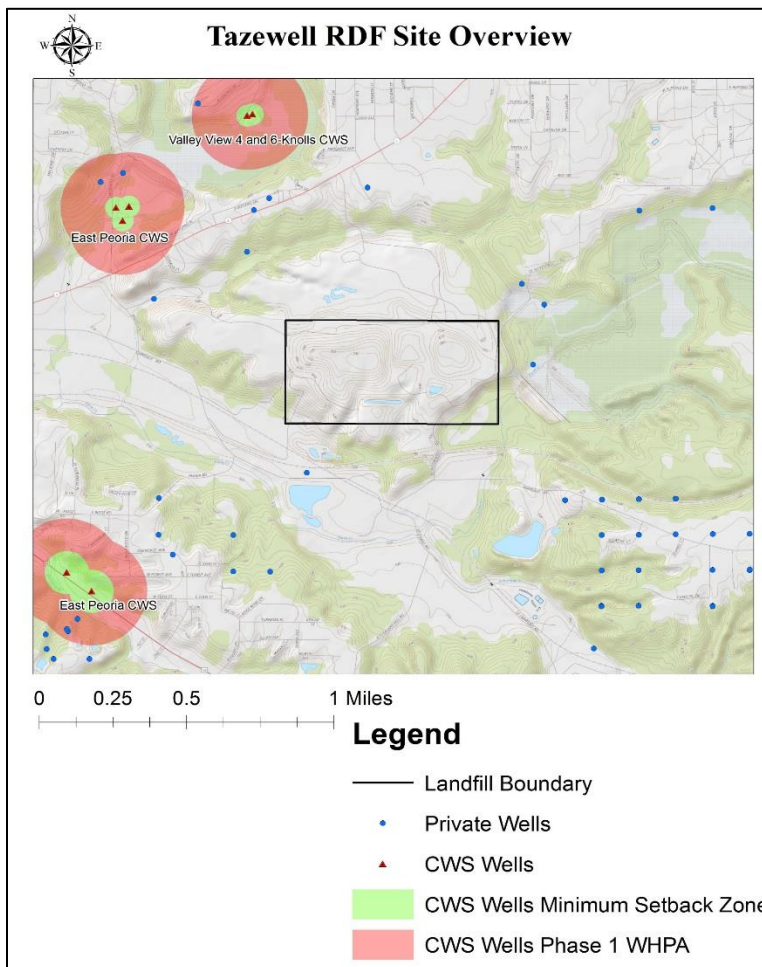
- Active period: 1974-1992
- Last inspection: 12/20/2016
- Completion of post-closure care requirements pending:
 - Application for a supplemental permit describing how intrawell background GW quality values are established.
 1. Replacement of G05-S, which has been dry since 2006.
 2. GW data from samples collected during four consecutive quarters needed to show the landfill is not causing GW contamination.
 3. Submission of new completion certification affidavit.

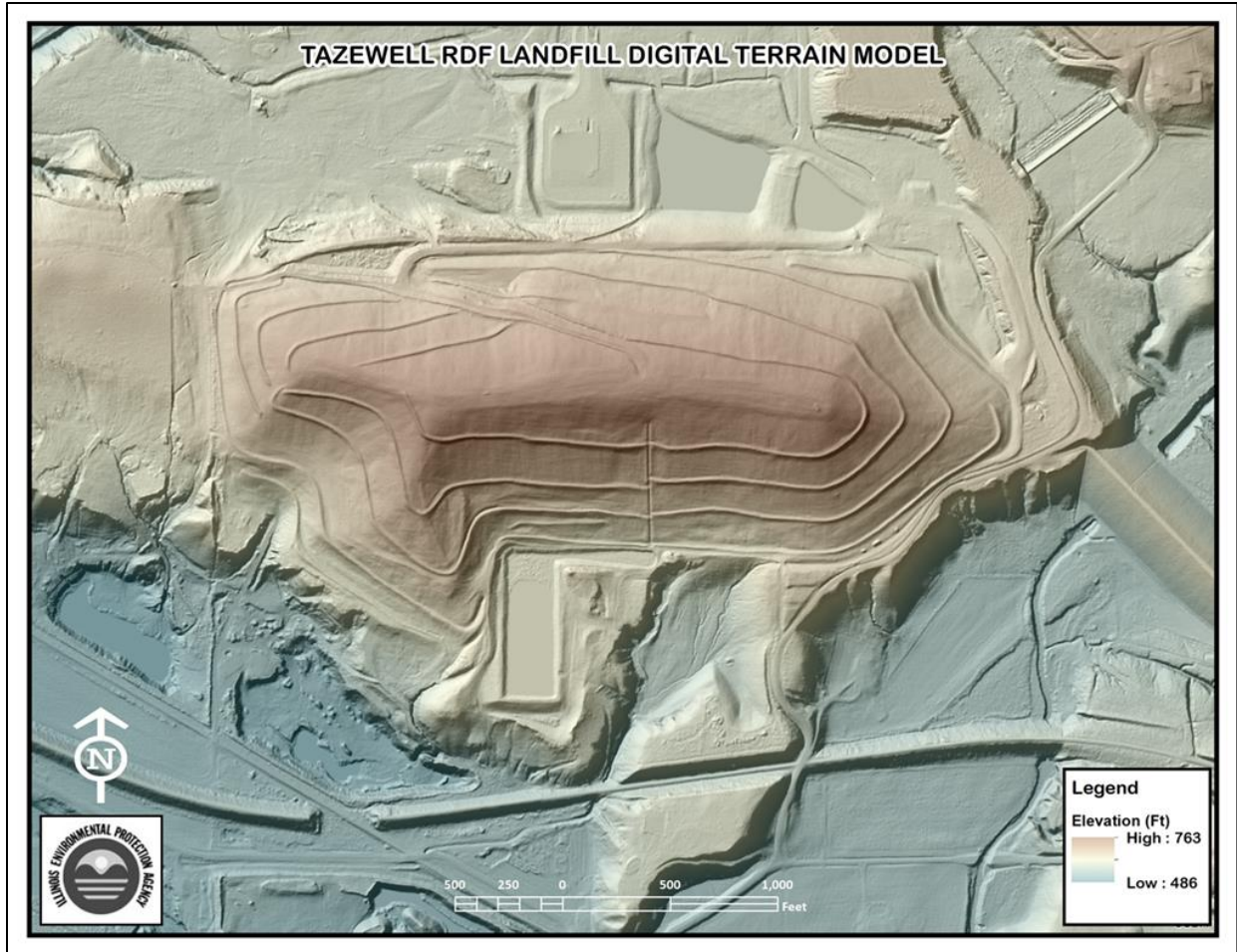




Tazewell RDF (Tazewell County)

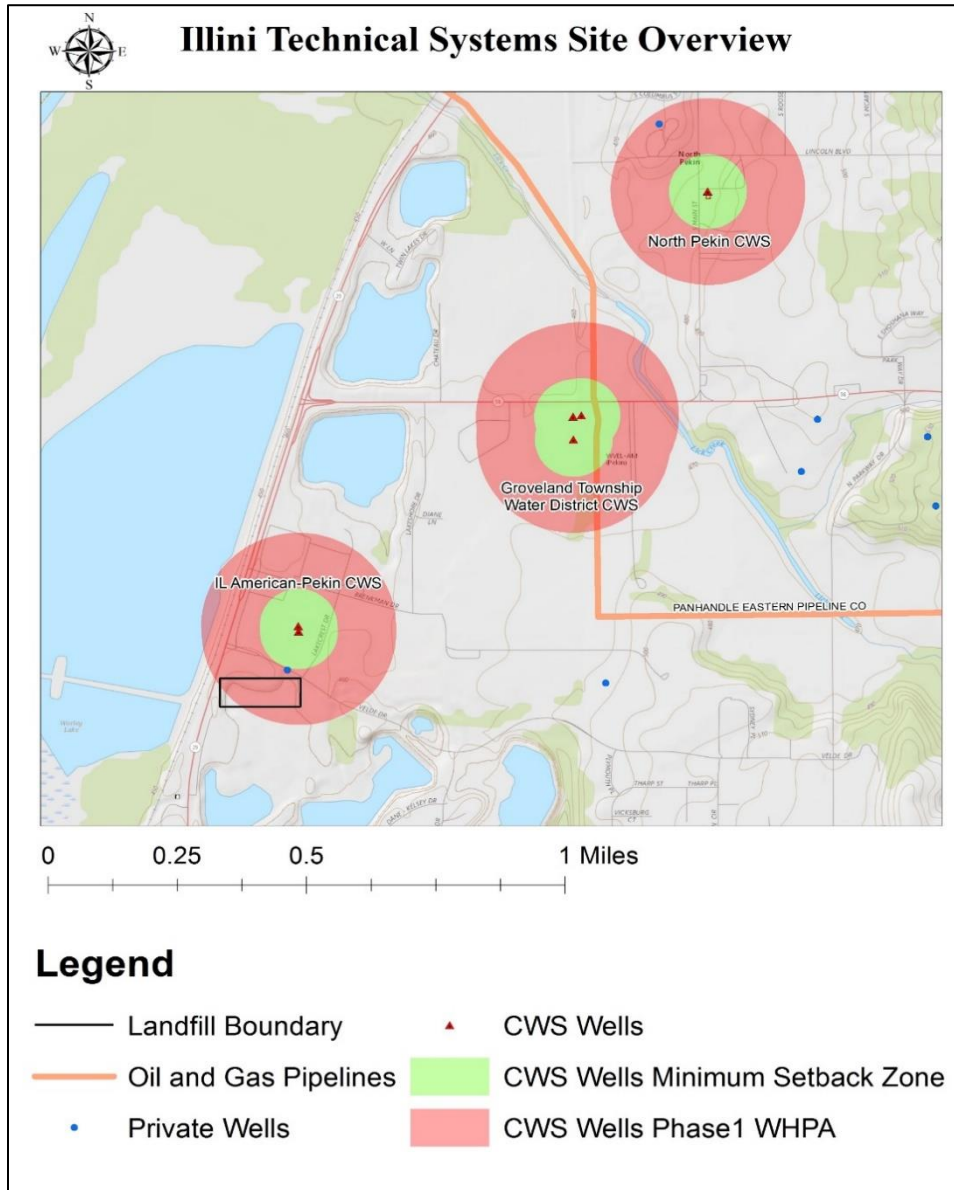
- Last Inspection: 04/18/2018.
- 30-Year post-closure care period began 09/28/2007.
- 2017 annual report shows high levels of acetone and tetrachloroethene.
- Acetone levels were the result of laboratory contamination by a third party.
- Potential threats from tetrachloroethene (C₂Cl₄)
 - Colorless liquid, commonly used for dry cleaning and metal degreasing.
 - Qualifies as a volatile organic compound, can become vinyl chloride when broken down.
 - Likely carcinogenic to humans.
 - Hazardous waste should not be at this landfill.
- Tazewell RDF GW monitoring well R62S is in corrective action for C₂Cl₄.
- Quarter of 2017 sample shows an observed increase of 3.8 µg/L
- Class 1 GW standard: 5 µg/L
- No drinking water Maximum Contaminant Level violations in community water systems to report.





Illini Technical Systems (Tazewell County)

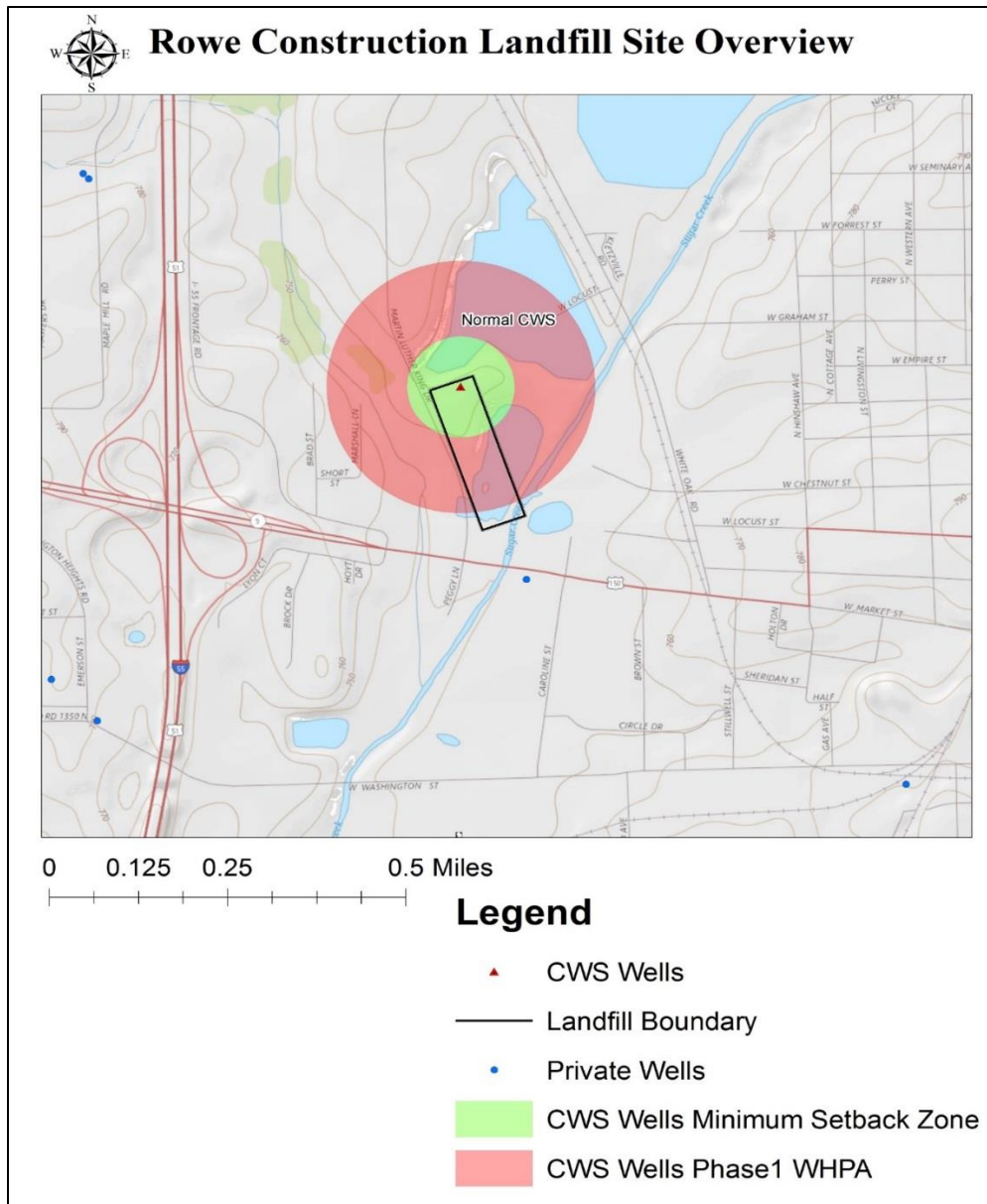
- Primary waste was construction materials/debris.
- Completion of post-closure care requirements: 06/30/2004
- Last inspection: 08/10/2004
- No potential threats to GW quality are apparent.





Rowe Construction Company Landfill (McLean County)

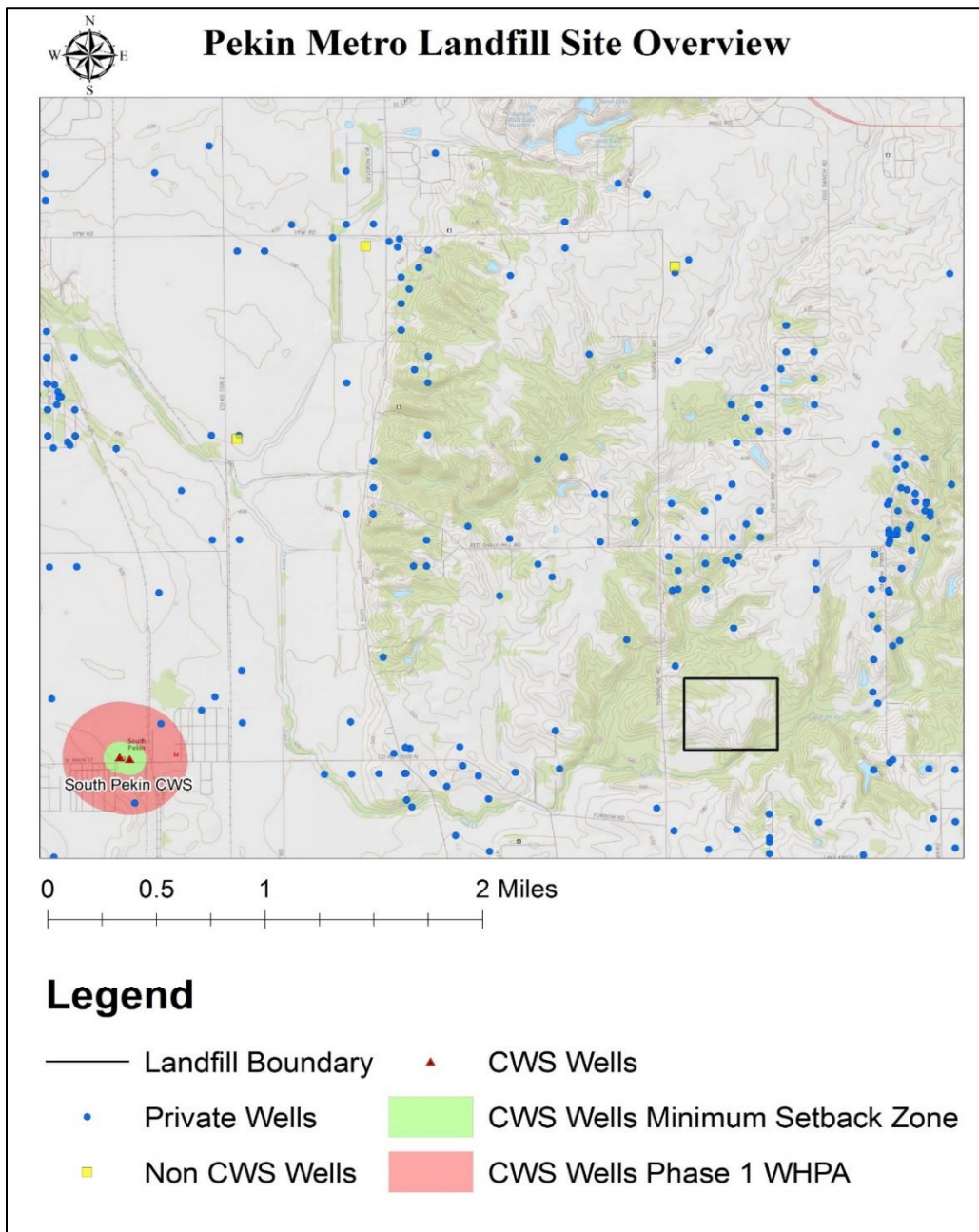
- 5-Year post-closure care period began 05/04/1989.
- Completion of post-closure care requirements: 05/04/1994.
- No potential threats to GW quality are apparent.

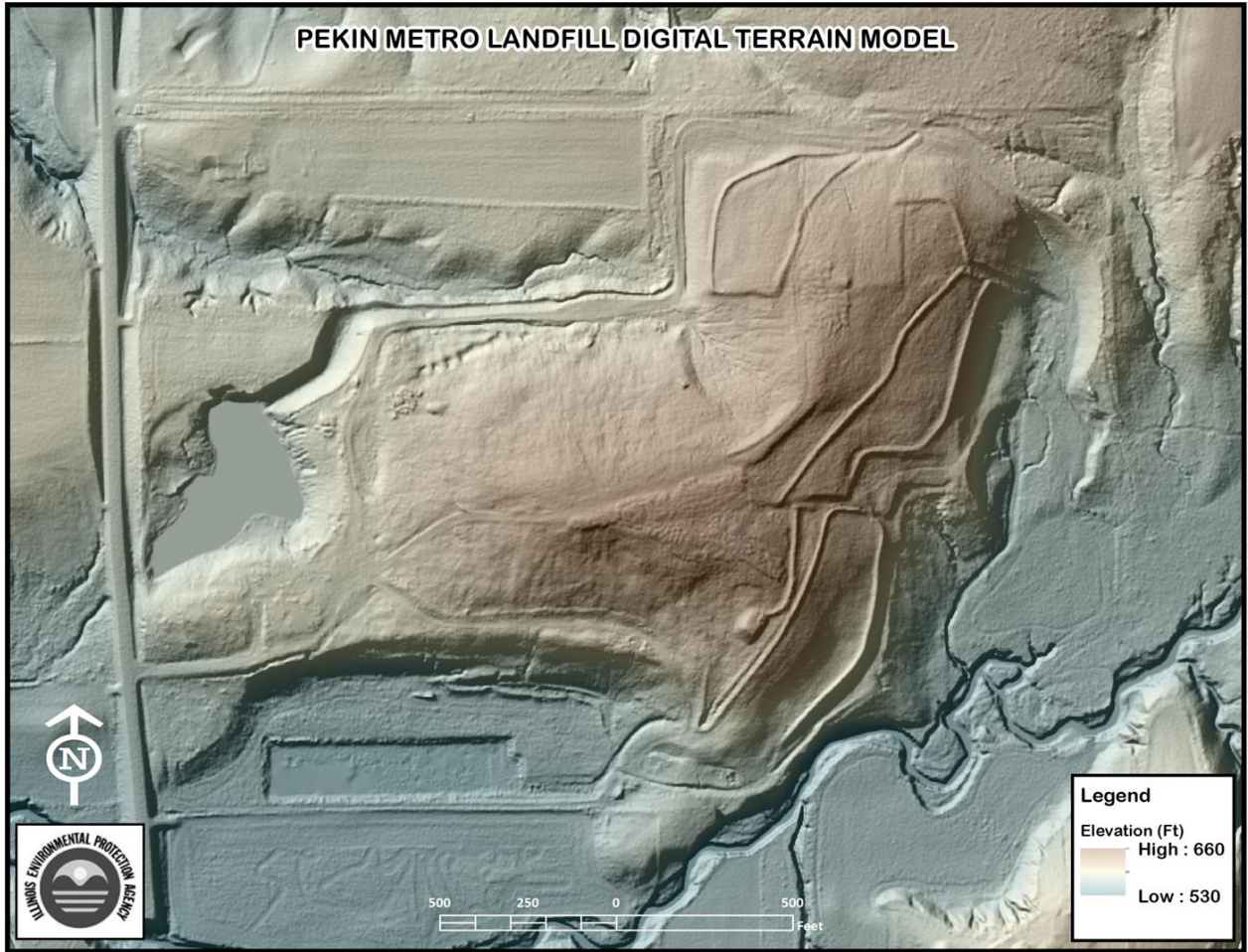




Pekin Metro Landfill (Tazewell County)

- Last Inspection: 07/19/2017
- Improved passive gas ventilation systems were installed in conjunction with cap expansion in fall 2014.
- Has yet to achieve certified closed status.
 - Last 5-year permit expired in 2001, since then there has been no operation or GW monitoring.
 - GW monitoring wells likely buried during 2014 cap expansion.
 - This will need to be remedied to initiate a post-closure care period.





Appendix E: Timeline of Illinois EPA's Involvement in the Peoples Gas Light and Coke Company Case

Illinois EPA has referred PGL to the AGO. The AGO leads negotiations with defendants (PGL) on behalf of the state. The IDNR has primary jurisdiction over the natural gas leak as the permitting Agency of the Manlove Field facility. While Illinois EPA does not regulate private wells that were found to be contaminated by the leak, the Agency opted to conduct independent sampling to provide information on the extent of groundwater contamination resulting from the natural gas leak, as the Agency does have legal authority over potential groundwater contamination.

The Illinois EPA also conducted indoor air sampling at each home that was affected. The indoor air sampling was all non-detect. None of the ambient air samples in the homes accessed by Illinois EPA staff exceeded a lower explosive limit (LEL) of 10 percent of the LEL for CH₄. Methane concentrations were not detected in any of the ambient air samples. An LEL of 10 percent CH₄ may have prompted IDPH to recommend a homeowner to evacuate. IDPH staff were present when Illinois EPA staff were assessing the LEL of CH₄ in the homes where groundwater samples were collected. A 10 percent LEL is a protective and conservative action trigger, because it is only 10 percent of the level of contaminant that would be anticipated to be combustible.

Following the sampling, which began in October 2017, Illinois EPA issued a VN to PGL in December 2017. The case was subsequently referred to the AGO on Jan. 5, 2018. Since April of 2018, the AGO, Illinois EPA, IDPH and PGL have been negotiating a 1st Amended Order. Illinois EPA prepared a map (Figure 14) of our results, PGL results, and Spiros Law results to show the extent of groundwater contamination by thermogenic gas in relation to naturally occurring biogenic methane. It should be noted that some of the wells sampled appear to have been impacted by a 1961 release.

McCORD #2 WITH RESULTS FROM PEOPLES GAS SAMPLING EVENTS TO DATE

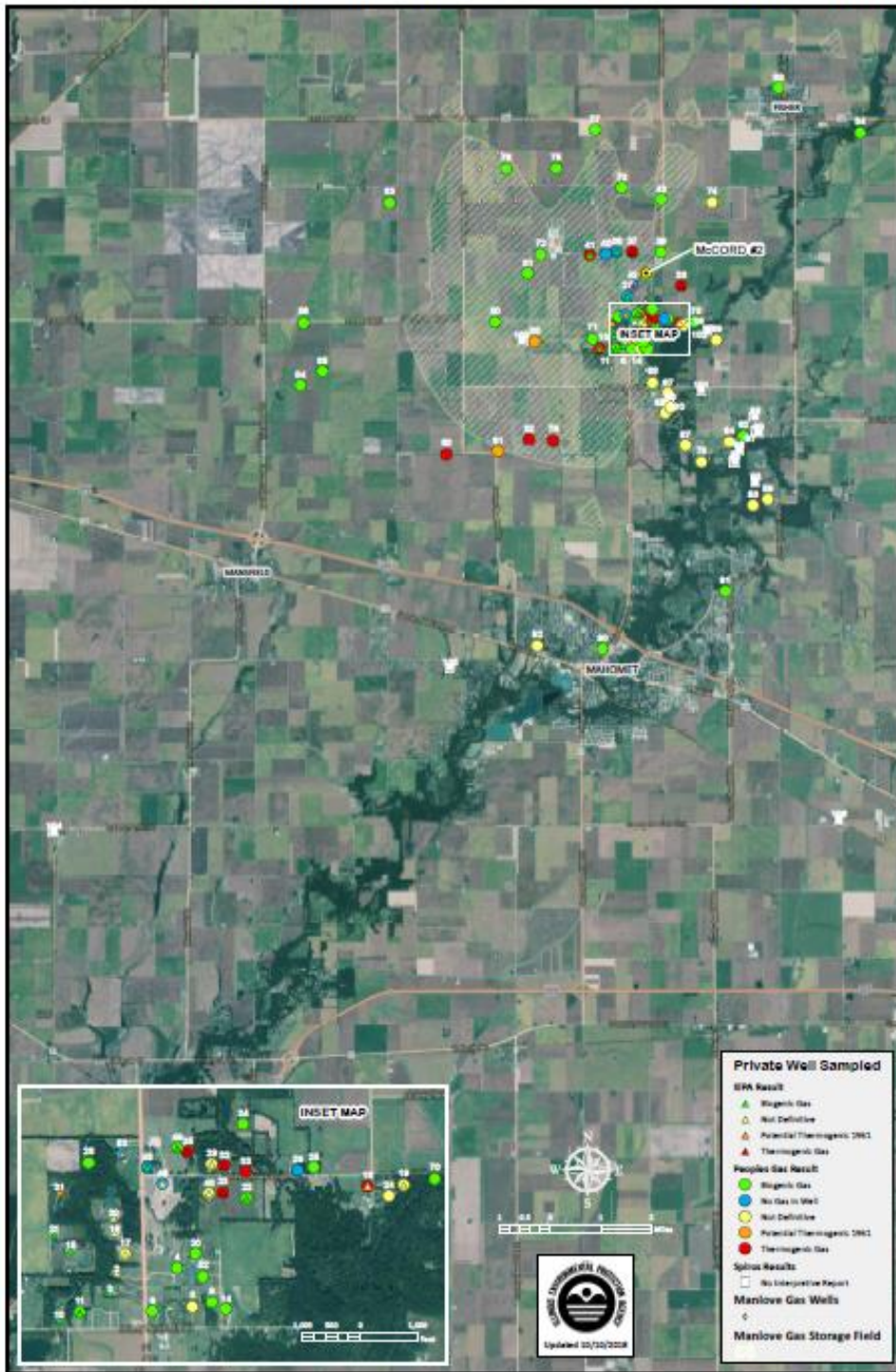


FIGURE 13: SAMPLING RESULTS FROM ILLINOIS EPA, PGL, AND SPIROS LAW FIRM SHOWING THE EXTENT OF GROUNDWATER CONTAMINATION BY THERMOGENIC GAS IN RELATION TO NATURALLY OCCURRING BIOGENIC METHANE (ILLINOIS EPA)

Appendix F: Dissenting & Concurring Opinions

The following statements represent the viewpoints only of the undersigned Task Force member or members and were not reviewed or approved by the full Task Force.

Dissenting Opinion re: The Need for a Perpetual Mahomet Aquifer Task Force

At its Nov. 19, 2018 meeting, the Mahomet Aquifer Protection Task Force approved the following motion:

Motion is to Develop a group with a mission similar to the Mahomet Aquifer Task Force and is a blend of other select individuals that serve in a quasi-government or government capacity to provide leadership administrative stature or process for regional water supply (Minutes from the Mahomet Aquifer Task Force Meeting, Nov. 19, 2018, "Minutes" at 10).

The motion was approved by a vote of 15-3; however, despite there only being three "no" votes, it became evident from the conversation preceding the calling of the question that there were many questions and a great deal of unclarity regarding what this "Task Force 2" group would be or what function it would serve. (See Minutes at 9-10). At the following meeting on Dec. 10, the Task Force then took the action of assigning numerous substantive issues to "Task Force 2" for future consideration. Whether all Task Force Members fully understand the scope or powers of this "Task Force 2" remains unclear. The Task Force member who originally made the motion for the creation of "Task Force 2" would not commit to it being a purely advisory body (Minutes at 10) and previous Task Force members have advocated for creation of governmental or quasi-governmental bodies with management or other authorities.

The undersigned object to both the creation of a "Task Force 2" with a loosely defined function and powers, and to its being assigned to address outstanding issues. Specifically, we object to task forces recommending that they remain in existence beyond their statutorily determined terms, scopes, and authorities; we object to the unnecessarily duplicative function that "Task Force 2" would serve; and we object to the assignment of issues that were deemed inadequate for the original Task Force's recommendation to a subsequent entity, thereby dragging-out the ability to focus on priorities and real threats to the aquifer.

An entity to study the Aquifer already exists

The Mahomet Aquifer Consortium (MAC) has been in existence for 20 years, and its mission is "to further study the Mahomet aquifer system, the river basins and surface waters... and to develop and recommend options for the planning and management of these valuable public resources." Experts from the ISWS and ISGS are active participants in the MAC's work, as are stakeholders with longstanding commitments to the aquifer. The undersigned are not aware of any shortcomings of the work of the MAC in furtherance of its mission to necessitate the formation of a "Task Force 2" to provide the same or overlapping functions. Additionally, the undersigned are not aware of what intended function(s) of "Task Force 2" could not be adequately performed by the MAC. The undersigned further believe that the creation of yet

another body, with an unknown authority or power, would show a lack of confidence in the well-established MAC.

A process to further support water supply planning already exists

The IDNR oversees and funds regional water supply planning. In the Mahomet aquifer area (East-Central Illinois Region) the ISWS, ISGS, and MAC have worked with the Regional Water Supply Planning Committee (RWSPC). The undersigned are not aware of any shortcomings of the work of the RWSPC, such that a “Task Force 2” is necessary to provide the same or overlapping functions.

The Task Force should not use the “Task Force 2” as an excuse to put off addressing issues

The Task Force, through its final report and recommendations has identified the most significant threats and actions to ensure the protection of the aquifer. The full implementation of these recommendations would likely take several years and a significant commitment of effort and resources by the State and all stakeholders. Despite these identified threats and actions, a number of additional issues have been assigned for later consideration by “Task Force 2.” These additional substantive issues include those that are not supported by the full Task Force or that require substantial additional analysis to better understand. The undersigned are concerned that this perpetuation of the Task Force via future recommendations coming from “Task Force 2” will weaken the commitment to implement the Task Force’s report, and create additional unnecessary uncertainty among those stakeholders in the aquifer area with regard to additional future recommendations or requirements. Further, the undersigned are concerned that assigning issues to future task forces shows an inability of the current Task Force to properly discuss and disseminate potential threats and possible actions that could be taken to protect the Mahomet Aquifer.

For the reasons articulated above, we object to the formation of a “Task Force 2” being among the recommendations of the Task Force.

Alec Davis, Illinois Environmental Regulatory Group

Donovan Griffith, Illinois Manufacturers’ Association

Steve Turner, representing Illinois Farm Bureau

Teresa Barnett, DeWitt County Emergency Management Agency

Opinion re: Use of HTEM in Landfill Siting

Issue N10 from the Comment Tracking Worksheet was discussed by the Mahomet Aquifer Protection Task Force during the Dec. 10, 2018, session. A motion was made, seconded, and approved by a majority vote that any future Task Force focused on protection of the Mahomet Aquifer should consider whether:

HTEM should be used for specific applications for permit for example in landfills or when there are hazardous substances being permitted

The comment further noted that the Task Force responses (provided prior to the meeting) included the following:

TF responses – Barnett: The TF should not be prescriptive or make requirements that are under local authority

IEPA Bureau of Land Chief, Todd Rettig – Landfill siting is permitted on a local basis

The undersigned do not support further consideration of a statutory or regulatory requirement to conduct helicopter-borne, time-domain electromagnetic (HTEM) characterization as part of the siting or permitting processes of hazardous waste treatment, storage, or disposal facilities, or of municipal solid-waste landfills for the following reasons:

1. The existing statutory siting process gives, and should continue to give, wide deference to local siting authorities (and their technical consultants) when judging the adequacy of site characterization methodologies and the interpretation of developed data.
2. The existing regulatory permitting process requires the applicant to conduct extensive geotechnical, geologic, and hydrogeologic investigations. The results of these investigations are carefully reviewed by Illinois EPA technical staff to ensure that the proposed facility is adequately characterized.
3. HTEM characterization is best used to provide relatively coarse judgements of subsurface sediment textures over regional scales; whereas site characterization for siting and permitting require characterization of the subsurface in much more detail and at scales much finer than those provided by HTEM.
4. There is no technical basis to justify the onerous burdens of greatly increased costs and the limited commercial availability of the HTEM methodology on the siting and permitting processes.

Dr. Charles Hostetler, PDC Technical Services, Inc.

Eric Ballenger, Republic Services

Teresa Barnett, DeWitt County Emergency Management Agency

Alec Davis, Illinois Environmental Regulatory Group

Keith Gleason, Teamsters Local 627

Donovan Griffith, Illinois Manufacturers' Association

Julie Moore-Wolfe, Mayor of Decatur

Jim Risley, Mahomet-Seymour School District

Larry Stoner, Mayor of Monticello

Steve Turner, Illinois Farm Bureau

Todd Zalucha, Mayor of Heyworth

David Zimmerman, Tazewell County

Dissenting Opinion re: Legacy Landfills

At its Dec. 17, 2018 meeting, the Mahomet Aquifer Protection Task Force (Task Force) voted to approve a “Revised Legacy Landfill Worksheet” and a series of “Legislative Recommendations” associated with legacy landfills. The majority of those casting a vote approved the proposal, with 4 “no” votes. For the reasons articulated below, the undersigned oppose the Task Force’s actions regarding legacy landfills.

The revised description of the “problem” is unduly alarmist

Each worksheet describing the topics that the Task Force determined to be a “threat” or “potential threat” (as with legacy landfills) presents a relatively objective assessment of the issue or problem that has created the threat or potential threat. The fact sheet dealing with legacy landfills, by contrast, strikes a far different and alarmist tone. Examples include the use of terms like “cemeteries of waste,” cherry-picking data in characterizing the potential of the threat (“by one estimate” and “as much as 50 percent”), and asserting that climate change will worsen the problem. Because of its intentional inconsistent tone compared to other worksheets in the report and because of the alarmist nature, we oppose its inclusion.

Legislative Recommendations are unnecessary

For most of the threats identified by the Task Force, the “Actions Targeted at Identified Threats” do not explicitly call for legislative action, rather the “Legislative Recommendations” are contained in a separate section of the report, and are generally targeted at aspects that require legislative approval of funds or new legal authorities. Adopting the recommendations targeted at legacy landfills as a series of Legislative Recommendations is once again inconsistent with the other threat-targeted recommendations, which we do not agree is necessary in this instance, and which raises additional specific concerns described below.

Specific recommendations approved by the Task Force are problematic

The undersigned object to certain factors specified for identifying priority legacy landfills in Recommendation #1 of the legacy landfill worksheet, as not being relevant to protection of the Mahomet Aquifer, and therefore outside of the scope of the Task Force’s charge.

The undersigned also object to Recommendations #2 and 3, regarding collecting, archiving, and assembling various items of information. No discussion was held during the Task Force’s 10 months of meetings and deliberations about the types of information being sought or what purpose that information would serve. We are concerned about what mechanism the legislature would create to facilitate or mandate the information collection, and what policies or decisions would be based on that information. By their very nature, legacy landfills are those that existed prior to the modern structure of environmental law and regulation, and what little information regarding those past activities may still exist, it is likely useless. The potential for misuse or misunderstanding of information gathered as part of Recommendations #2 and #3 on legacy landfills is concerning.

For the reasons articulated above, we object to the Task Force’s handling of legacy landfills.

**Alec Davis, Illinois Environmental
Regulatory Group**

**Donovan Griffith, Illinois
Manufacturers’ Association**

**Teresa Barnett, DeWitt County Emergency
Management Agency**

David Zimmerman, Tazewell County

Dec. 21, 2018

Dissenting Opinion re: Underground Natural Gas Storage

December 19, 2018

Mahomet Aquifer Protection Task Force
c/o Illinois Environmental Protection Agency
1021 N. Grand Ave., East
P.O. Box 19276
Springfield, IL 62794

RE: Senator Rose Partial Dissent to the MAPTF Final Report

Dear Task Force Members,

I am happy to join my Task Force colleagues in support of the overall report; however, I must, unfortunately, dissent to a few of the changes that occurred at the very last meeting of the Task Force. For background, members of the Task Force received on Friday December 14, 2018, updated versions of the draft report and proposed changes from our last meeting. These changes were to be voted on at our next, and final, meeting on Monday Dec. 17, 2018. Among those proposed changes were several additional items that were placed into the report related to the Underground Natural Gas Storage Protection Worksheet (the “Worksheet”) and Appendix “E” of the report (the “Appendix”).

The changes in question were apparently suggestions of staff at the Illinois EPA. Some of the suggested “additions” between versions of the Worksheet and the Appendix appeared as “highlighted” text on the documents sent out on December 14th. Importantly, however, not all the additions and, apparently, none of the deletions from previous versions were so “highlighted” or otherwise called to the attention of the Task Force members.

Therefore, as a predicate matter, I dissent from the adoption of these changes because without a complete accounting of all the additions and deletions from the previous version which would be necessary to judge the full content and context of the requested changes, the Task Force could not possibly have properly evaluated the staff’s proposed changes to these important sections of our report. That reason alone is worthy of dissent; however, this is not my only rationale for so doing.

Indeed, the actual insertions in some cases presented the opinions of, and narrative summation, of IEPA staff – without the ability for review of the underlying supporting documentation by the Task Force members. Task Force members were given no opportunity at the final meeting to examine the veracity, or determine the accuracy, of these suppositions and summaries as the underlying documents were not available to verify the claims. Moreover, and while I respect the time and effort that IEPA staff put into this overall Task Force, the following troubled examples point out why it was inappropriate for these “last minute” and, unverified assertions to be included:

Dec. 21, 2018

- The assertion that gas separators were installed in homes impacted by the PGL leak found in the second bullet point in the Worksheet as a “mitigation,” leaves open the interpretation that these separators have solved the problem of gas getting into the drinking water of my constituents.

Consider the following: one of the home’s IDPH separator variance approval was not obtained until August 3, 2018, and Peoples Gas still has not completed the task – that is 138 days since approval of the variance and now 2 years after the leak was discovered! Another household that previously received piping is still waiting on follow-up issues to be completed by Peoples Gas from the installation of separators. Waiting for 2 years to complete work cannot be “squared” with the report’s assertion that mitigation efforts, “installed gas water separators in the homes of the residents contaminated by the McCord #2 release.” To claim otherwise, as these changes did, and the report now does, at best, demonstrates an ignorance of the ongoing situation on the ground in and around the leak site.

Further, while the presence of Peoples Gas’ contamination that led to the necessity for separators, the separators themselves have also caused other issues with drinking water and overall safety. From an Aug. 3, 2018, IDPH report:

“From the information provided, the Sentry I Systems have not reduced methane levels to IDPH’s established maximum concentration of less than 10 mg/L. Additionally, the chlorine feed system, which is part of the Sentry I System, does not accurately control the concentration of chlorine in the finished drinking water. Finally, the homeowners that have the Sentry I Systems installed in their homes have not been given appropriate warnings regarding possible dangers associated with nor the necessary training to safely and effectively operate, those systems.”

To leave open to implication the notion that the “separators” are fully mitigating the problem, ignores the reality of what is going on and does a disservice to my constituents affected by this leak. Not to mention the fact that PGL’s contamination should never have been there in the first place.

- The summation of PGL’s venting operation conveniently ignores the fact that PGL’s first attempts were unreported and without required flares, and the Illinois Department of Natural Resources had to take action to correct the entire operation. Again, this verbiage leaves open the wrongful interpretation that somehow, this mitigation has gone swimmingly.
- The summation of relief wells that was added at the eleventh hour is highly confusing and possibly inconsistent with other known data about those operations. Even if correct, it raises still more questions than it provides answers which, in turn, only adds to the confusion. Indeed, I am confident that both items could have been resolved if raised earlier and should not have been included without further vetting by the Task Force.
- Similarly, Appendix E had several references to LEL sampling that was included without any opportunity to review the actual reports and no dates or other references were given as to the timeline of the sampling. Nonetheless, the inclusion of statements that samples obtained by the State were all “non-detect” and that no samples were taken above the 10% LEL “safe” level provides the inference that “all is well” for these homeowners. Yet at least one homeowner had a measured LEL of 30.3% coming from their bathroom faucet! While the included assertion is possibly technically accurate in that this sample was taken by PGL, and not state employees, to use a phrase like, “all ‘non-detect’” certainly conveys the impression of everything being under control and safe. To include it, paints an overly “rosy” picture of mitigation efforts to date.

Again, without the context and time and ability to review and question the supporting data or underlying assumptions, the insertion of these items was unwarranted and could easily lead the reader

Dec. 21, 2018

of our report to conclude that everything must have been taken care of with respect to the Peoples Gas' leak, when nothing could be further from the truth. Yes, some mitigation has occurred. And, yes, I would have supported some of the other additions to the Appendix and the Worksheet that I know to be accurate. All that aside, however, to be perfectly clear: the mitigation work that needs to be done to make my constituents whole is far from finished. No one should take away from the Appendix or Worksheet any inference of finality or completeness of the mitigation.

Unfortunately, the last-minute nature of these changes deprived the Task Force members of the ability to question the accuracy and veracity of these items and, more importantly, the ability to correct, if necessary, the same was also precluded. And, again, the fact that members were not given a complete "redline" showing ALL changes, additions, and deletions is, in and of itself, a legitimate reason to dissent to the additions to the Worksheet and Appendix that occurred on Monday December 17, 2018.

To conclude, while I am very proud of the overall work product contained in the report and of the work put into the Task Force by its members, and the IEPA assigned staff (who I greatly appreciate and thank for their time and effort), I must, respectfully, dissent to the inclusion of some of the items contained in the Worksheet and the Appendix while I join in supporting the rest of the report.

Sincerely,

A handwritten signature in cursive script that reads "Chapin Rose".

Chapin Rose, St. Senator – 51st Senate District

Diane Marlin, mayor of Urbana

Jim Risley, Mahomet-Seymour School District

Larry Stoner, mayor of Monticello